



# Partnership For Growth: El Salvador Constraints Analysis

Joint USG-GOES technical team  
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## Acronym List

|          |   |
|----------|---|
| AIC      | Akaike Information Criteria   |
| AIDS     | Acquired Immunodeficiency Syndrome  |
| AIES     | El Salvador International Airport   |
| AML      | Anti-Money Laundering   |
| ANDA     | National Administrator of Aqueducts and Sewers                                    |
| BCR      | Banco Central de Reserva (Central Bank of the Republic)                           |
| CA       | Constraints Analysis  |
| CAFTA    | Central America Free Trade Agreement  |
| CAFTA-DR | Central America Free Trade Agreement-Dominican Republic                           |
| CEL      | Comision Ejecutiva Hidroelectrica del Rio Lempa                                   |
| CEPA     | Comision Ejecutiva Portuaria Autonoma   |
| CNE      | National Emergency Comission  |
| CONAMYPE | Comisión Nacional de la Micro y Pequeña Empresa                                   |
| DfID     | Department for International Development  |
| DIGESTYC | Direccion General de Estadistica y Censos (National Census Agency of El Salvador) |
| DR       | Dominican Republic  |
| ECLAC    | Economic Comission for Latin America and the Caribbean                            |
| EHPM     | Multipurpose Household Surveys  |
| EMBI     | Emerging Markets Bond Index   |
| EMC      | Marginal Efficiency of Capital  |
| ETESAL   | Empresa Transmisora de El Salvador  |
| EXPY     | Export-weighted average of the PRODY for that country                             |
| FAO      | UN Food and Agriculture Organization  |
| FDI      | Foreign Direct Investment   |
| FESAL    | Encuesta Nacional de Salud Familiar   |
| FH       | Feldstein Horioku   |
| FMLN     | Frente Farabundo Martí para la Liberación Nacional                                |
| FTA      | Free-Trade Agreement  |
| FUSADES  | Fundación Salvadoreña para El Desarrollo Económico y Social                       |
| GCR      | Global Competitiveness Report   |
| GDP      | Gross Domestic Product  |
| GOES     | Government of El Salvador   |

|           |   |
|-----------|---|
| HHI       | Herfindahl-Hirshman Index   |
| HKW       | Hausman, Klinger, Wagner 2008: “Doing Growth Diagnostics in Practice: A Mindbook”     |
| HRV       | Hausman, Rodrik, Velasco (2007) paper   |
| i         | interest rate   |
| IADB, IDB | Interamerican Development Bank  |
| IDD       | Index of Deficit from Disasters   |
| IMF       | International Monetary Fund   |
| IPIAI     | Infrastructure Private Investment Attractiveness Index                                |
| KEI       | Knowledge Economy Index   |
| LAC       | Latin America and the Caribbean   |
| LAPOP     | Latin American Public Opinion Project   |
| LGDP      | Log of Gross Domestic Product   |
| LMIC      | Lower-Middle Income Countries   |
| MAG       | Ministry of Agriculture   |
| MENA      | Middle East and North Africa  |
| MG        | Megawatts   |
| MINEC     | Ministry of the Economy   |
| MOPTVDU   | Ministry of Public Works, Transport, Housing, and Urban Development                   |
| MPK       | Marginal Product of Capital   |
| MPL       | Marginal Product of Labor   |
| MWh       | Megawatt hours  |
| NAFTA     | North America Free Trade Agreement  |
| OCAVI     | Observatorio Centroamericano sobre Violencia (Central American Violence Observatory)  |
| PAN       | Panama  |
| PAHO      | Pan-American Health Organization  |
| PATH      | Export production linkage index   |
| PD        | Power Dispersion  |
| PNUMA     | Programa de las Naciones Unidas para el Medio Ambiente (UN Programme for Environment) |
| PfG, PFG  | Partnership for Growth  |
| PPP       | Purchasing Power Parity (also Public-Private Partnerships)                            |

|        |   |
|--------|---|
| PRODY  | Productivity index of exports                                       |
| PROESA | El Salvador Export and Investment Promotion Agency                  |
| PVI    | Prevalent Vulnerability Index                                       |
| RER    | Real Exchange Rate  |
| RMI    | Risk Management Index   |
| ROA    | Return on Assets  |
| SAIDI  | System Average Interruption Duration Index                          |
| SAIFI  | System Average Interruption Frequency Index                         |
| SC     | Schwarz   |
| SD     | Sensitivity Indices of Dispersion                                   |
| SIEPAC | Sistema de Interconexión Eléctrica de los Países de América Central |
| SIGET  | General Superintendence of Electricity and Telecommunications       |
| SME    | Small and Medium Enterprises  |
| SNET   | National Territorial Studies Service                                |
| SVC    | Salvadoran Colon  |
| TEU    | Twenty-foot Equivalent Unit   |
| TFP    | Total Factor Productivity   |
| TIMSS  | Trends in International Mathematics and Science Study               |
| UNESCO | United Nations Education, Scientific, and Cultural Organization     |
| USAID  | United States Agency for International Development                  |
| USD    | United States Dollar  |
| USG    | United States Government  |
| VAR    | Vector Autoregressive model(s)                                      |
| VAT    | Value-Added Tax   |
| WB     | World Bank  |
| WDI    | World Development Index   |
| WEF    | World Economic Forum  |
| WGI    | Worldwide Governance Indicators                                     |
| WHO    | World Health Organization   |
| XRAT   | Exchange Rate   |

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## 1. Executive Summary

This constraints to growth analysis (CA) was prepared by a joint technical team composed of economists from the Government of El Salvador and the Government of the United States. Its purpose is to provide an analytical and empirical foundation for joint efforts to promote broad-based economic growth in El Salvador. These efforts will be undertaken as part of Partnerships for Growth (PfG), an effort by the Obama Administration to foster growth in a select number of countries and seed the next generation of emerging markets. The exercise of analyzing growth restrictions under the Partnerships for Growth has been enriching for both governments, as it has helped to deepen the shared understanding of the problems of economic growth in El Salvador.

All four of the countries selected for the Partnerships for Growth undertake a Constraints Analysis following the growth diagnostics methodology developed by Hausmann, Rodrik, and Velasco (HRV). The results of these studies are intended to facilitate planning of a consensus set of near-term public policies agreed to by the partner country and United States governments aimed to improve investment and economic growth.

This analysis drew on information from a wide variety of sources, including data provided by various entities of the Government of El Salvador, analysis from international organizations (including the International Monetary Fund, the World Bank, and the Inter-American Development Bank), and the work of independent experts. It also benefited from various consultations and seven total focus groups over a period of three months with a variety of stakeholders in El Salvador, including government officials, entrepreneurs, and academics.

Using this data and internationally comparable indicators, surveys, cross-sectional and panel data, graphical, statistical, and regression analysis and other tools, it systematically analyzes potential factors that may be hindering private investment in the economy. It identifies two binding constraints to growth—factors that, based on the available evidence, can be said to be the most critical obstacles to private investment and to economic growth. These constraints impose a very significant cost—or “shadow price”—on the economy.

The study focused on the economy of El Salvador; these are some of its most salient characteristics:

- With a mostly-urban population of 6.2 million people, El Salvador had a Gross Domestic Product (GDP) of US\$21.2 billion in 2010.
- Since the Peace Agreements in 1992, El Salvador has demonstrated mixed economic growth. According to World Bank statistics, the country experienced a post-war boom between 1992 to 1995, when it averaged annual economic growth of 6.8 percent. From 1996 to 2000, annual economic growth averaged a much lower 3.0 percent. For the past decade from 2000-2009, El Salvador averaged just 2.1 percent annual economic growth, with GDP

receding by 3.1 percent in 2009 due to the financial crisis. The rates of growth over the last decade are below the Latin American average.

- A historically open economy, El Salvador is part of CAFTA-DR, a regional free trade agreement with the United States, and has six Free Trade Agreements with Chile, Mexico, Panama, Dominican Republic, Colombia and Taiwan. El Salvador is also part of the Tratado General de Integración Centroamericana (Central America General Treaty).
- Today, this is a service-dominated economy: the services sector accounts for 60 percent of GDP, manufacturing for about a quarter, and agriculture and related sectors for 12 percent.
- The economy has been officially dollarized since January 2001; annual remittances, mostly from workers in the United States, amount to 17 percent of GDP.
- El Salvador's most important export category remains maquila products (manufactured products assembled for re-export), which have traditionally encompassed low value-added and are not technologically intensive; maquila products account for almost half of all exports.
- The stock of foreign direct investment (FDI) increased from US\$1.97 billion in 2000 to US\$7.76 billion in 2010, mainly directed to the financial and manufacturing industries. The United States remains the largest source of FDI to El Salvador.

## **A. Key Conclusions of the CA**

The study identified two binding constraints to growth in El Salvador:

### **a. Security/Crime**

The “shadow price” (the effect on GDP if the constraint were removed) of crime is between 4.8 percent and 10.8 percent of GDP spent or foregone due to crime (depending on whether health costs are included). Either of these figures is higher than the Central American average and more than double the figure for Costa Rica, the only country in Central America not classified as having an “epidemic” level of crime. Moreover, just under half of businesses surveyed by the World Bank Enterprise Survey report that crime is an obstacle to their operations—at least 15 percentage points more than the Latin American and lower-middle-income average. In the Global Competitiveness Report, El Salvador ranks last out of 139 countries under the Organized Crime indicator, and next-to-last in Business Costs of Crime and Violence.

- Economic growth does show some movement with crime rates for the period from 1994 to 2000. Also, higher numbers of robberies per 100,000 in a municipality correlates with lower scores on a Municipal Competitiveness Index for that municipality.
- According to surveys in El Salvador, businesses spend 7.7 percent of their budget on security. A related study estimates that businesses and families spent a combined 4.7 percent of GDP on private security in 2007. Private security guards outnumber police by a ratio of 3 to 2 in El Salvador.

- Larger businesses have been shown to be more capable of absorbing the security costs and are less affected by crime (measured as percent of sales lost) as a result. In addition, there is strong anecdotal evidence that certain industries which are more affected—such as delivery and bus companies—also suffer more. Public transportation has been particularly hard-hit, with the burning of a bus last summer with 17 people on board and a bus strike as a result of the Congress passing an anti-gang law. The strike closed 80 percent of public transportation. The bus companies seemingly were protesting due to fear of reprisal by the gangs.
- Understanding causes and effects of particular types of crime in El Salvador is an important next step. We also note that possible remedies for this constraint extend well beyond the traditional responses of increasing security, and should also include a comprehensive and integral strategy. Initiatives including (but not limited to) improving school attendance and quality to facilitate viable economic opportunities for vulnerable youth should be combined with prevention strategies.

#### **b. Low Productivity in the Tradables Sector**

- The share of output of tradables has been declining in El Salvador since 1990, perhaps as a consequence of low productivity of Salvadoran firms operating in the tradables sector. El Salvador's share of tradables as a percent of GDP has declined from 45 to 40 percent over this period and has consistently been 5-10 percentage points below the average for Middle-Income Countries, and 10-15 percentage points below the Lower-Income Country average. El Salvador may be missing 8 percentage points of GDP compared to CAFTA colleagues due to the productivity constraint in tradables.
- In this context, “tradables” refers to products that are or can be traded internationally. Their prices are set on international markets, whereas the prices for non-tradables are set domestically.
- Because their prices are set in international markets, the price of tradables facing Salvadoran firms is conditioned by factors largely exogenous to production. Therefore, the Salvadoran tradables sector is the world tradables sector, and El Salvador's competition in tradables is global competition. With prices set at or very near world prices, Salvadoran firms must have a high level of productivity in order to enter the tradables sector. The observation that share of output in tradables is falling, even while it is rising in neighboring countries such as Panama and Nicaragua, implies that firms are not able to realize such high levels of productivity.
- Low productivity and accompanying relative lack of competitiveness in international markets dampens the possibility for a structural transformation and accompanying growth acceleration in El Salvador, where the growth potential of the non-tradables sector is limited by the small size of the country.
- Agents may attempt to bypass this constraint in the form of maquilas, which receive tax and tariff exemptions to reduce their costs.



- Because we did not find that transportation, finance to large firms, or innovation issues are binding constraints in this analysis, low productivity in the tradables sector seems less likely to be due to these issues.
- Economic theory implies that because El Salvador's tradables sector needs to be competitive with world markets, the factors of production of tradables must also be competitive with world markets. The canonical total factors of productivity include human capital, physical capital, financial capital, and often logistics/transportation. Institutional environment also affects productivity. While we cannot conclude that human capital is a binding constraint in itself, it is clear that the quality of El Salvador's education is far below what would be competitive in the world market. The data point to particular short comings in the poor attainment scores in math and science education in upper primary and secondary education, and a relatively higher demand for labor with tertiary education. Anecdotal evidence from the private sector suggests a lack of vocational education aimed at developing skills needed in the labor market, particularly English language skills.
- We also point out that crime and security issues effectively act as an additional tax on the Salvadoran economy. These additional costs make it more difficult for the tradables sector to compete globally.
- Other issues that merit investigation for the low productivity in the tradables sector include physical capital use and logistic efficiency.

In addition to the binding constraints identified above, the study also included a detailed inquiry into a broad range of potential constraints including the following topics:

- Cost of Finance, including interest rates, international finance, domestic savings, financial intermediation (costs, competition, and risks), and costs of finance by firm size of enterprise;
- Appropriability, including political uncertainty, institutions, informality, macroeconomic stability, and innovation;
- Social Returns, including human capital in education and health; transportation, water, and electricity infrastructure; and geography.

## **B. Methodological Caveats**

To identify the binding constraints, the methodology suggests the application of four tests that each candidate constraint must pass. This step imposes analytical rigor in the identification of binding constraints in order to establish the crucial discipline in decision-making needed to direct public resources toward the resolution of a constraint to growth.

While the HRV approach is the methodology chosen for the Partnerships For Growth Constraints Analyses in the four selected PFG countries, other approaches may yield different results. The identification of binding constraints is something of a “disciplined art,” but ultimately the analyses for PFG need to be driven by hard data to arrive at credible conclusions.

Because the CA process requires strong evidence to reject the hypothesis that a restriction is not binding, in working through this constraints analysis we encountered topics that we could not accept as a binding constraint because of a lack of solid data (as opposed to concluding that the topic was not a constraint because of contrary data).

The areas where we ultimately lacked data to make a conclusion include credit to small and medium enterprises, climate change and vulnerability, and institutions of government effectiveness in commerce and some particular areas of the justice system. We suggest that more data collection on these issues, as well as on labor market issues such as education and the drivers of emigration, would significantly aid an understanding of current constraints to growth in El Salvador.

We stress that not identifying other issues as binding constraints should not imply that El Salvador does not need continued improvement in those other areas in order to enjoy continued economic growth. Indeed, if those other areas were to be completely neglected, they can quickly become binding constraints themselves. The country must give constant attention to the many factors that affect economic growth.

Finally, we recognize that public policy and national development have many important goals and functions beyond economic growth through private sector investment. Even if a particular issue is not identified as a current binding constraint to economic growth in this analysis, it does not rule out the possibility that the same issue could be a constraint to other public policy objectives. Other objectives of public policy beyond economic growth are indisputably important, but are beyond the scope of this particular analysis.

## **2. Partnership for Growth and El Salvador**

### **A. Partnership for Growth**

Partnership for Growth (PFG) is based on the principles set forth by President Obama's Presidential Policy Directive on Global Development in an effort to transform the character of the United States' bilateral relationships with a select set of top-performing low-income countries. The goal of this effort is to accelerate and sustain broad-based economic growth to create the next generation of emerging markets. El Salvador is one of four nations currently participating in this effort.

Partnership for Growth (PFG) aims to change the donor-recipient dynamic to a more collaborative relationship that encompasses far more than foreign assistance. Building on these foundational conditions, PFG will embrace the following six principles:

- Focus on Broad-Based Economic Growth
- Focus on Select Countries with Demonstrated Commitment and Performance
- Joint Decision-Making and Prioritization Through Rigorous Analysis
- Focus on Catalytic Policy Change and Institutional Reform
- Leveraged United States Government (USG) Engagement for Maximum Impact
- Emphasized Partnership and Country Ownership

As a first step towards implementing the PFG strategy, the United States and El Salvador established a joint USG-PFG analytical team to identify binding constraints to growth in El Salvador. This report captures the results of that joint USG-PFG growth diagnostic study and is intended to inform a joint plan of action to address identified growth constraints.

As USG-PFG partners in the United States and El Salvador move forward in designing and executing an action plan based on this document, analytical teams will continue to collaborate in establishing evidence-based monitoring and evaluation frameworks to track PFG progress on macro-level economic, business, and other indicators.

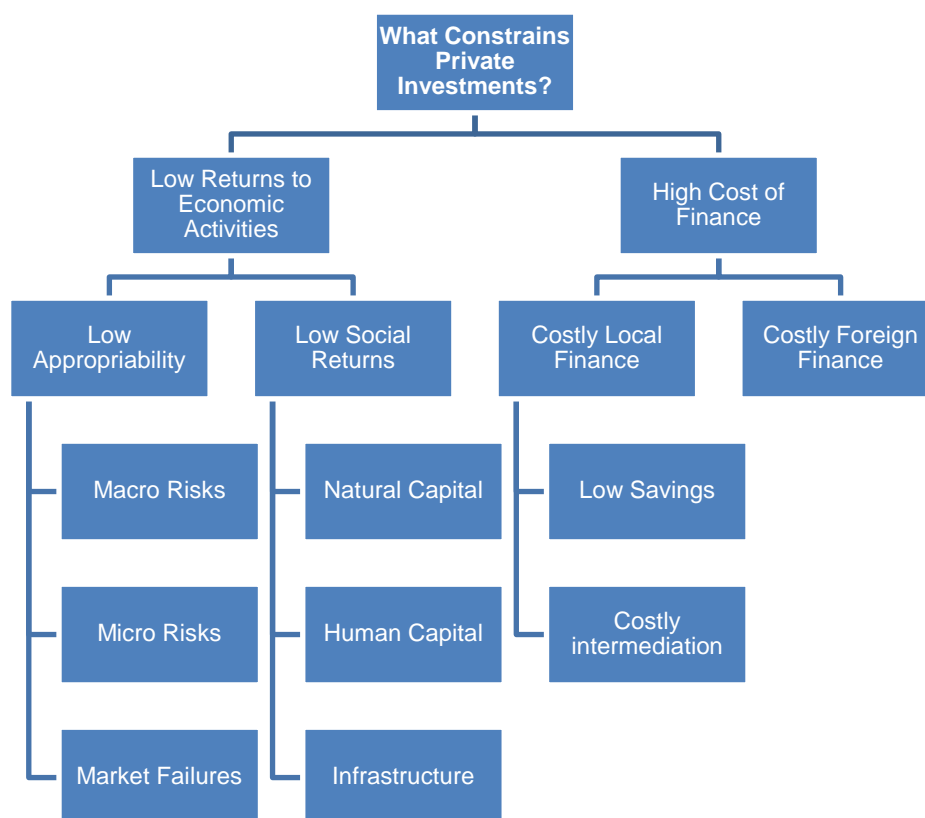
### **B. Growth Diagnostics Methodology**

The purpose of the Constraints Analysis (CA) is to identify the root causes that deter households and firms from making investments of their financial resources, time, and effort that would significantly increase their incomes. The CA is not intended to dictate specific projects to be funded, but rather to provide a framework that will help focus the consultative process on appropriate programs that will ease those constraints and stimulate economic growth. A successful CA will constitute a solid foundation for the formation of a partnership and

development strategy between El Salvador and the United States that addresses country priorities and is consistent with economic growth.

Successfully undertaking a CA involves posing and answering a sequence of diagnostic questions that highlight the “root causes” that constrain investment. Figure 2.1 presents a hierarchical framework to organize and motivate the questions driving the CA based on the organizing framework presented by Hausmann, Rodrik, and Velasco (2004). Answering those questions involves: (1) selecting and formulating the diagnostic questions in a sensible way for the country at hand; (2) researching and marshalling key evidence and data that shed light on the questions; and (3) answering the questions given the balance of such evidence (Millennium Challenge Corporation 2009).

**Figure 2.1: Constraints Analysis Framework**



In El Salvador and elsewhere, the question of identifying and overcoming constraints to economic growth has been posed implicitly in the course of development planning for many years, and explicitly at least since Hausmann, Rodrik, and Velasco’s 2005 manuscript, “Growth Diagnostics.” The joint USG-GPH analytical team (“CA team”) approached the task of identifying the most binding constraints to growth in this context, and aimed to build on, update, and where possible refine relevant prior work.

This Growth Diagnostics exercise took place from late February through early May in El Salvador and in Washington DC was performed by a joint technical team comprised of Salvadoran and American economists. It was strongly evidence-based and all conclusions were built upon consensus among the members of the bilateral team. The Growth Diagnostics corpus, including the 2005 manuscript, the Mindbook, and the Pritchett DfID papers impose an evidentiary basis for conclusions grounded in the following four tests:

- The shadow price of a constraint to growth needs to be very high;
- Movements in the constraint should produce movements in the objective function;
- Agents in the economy should be actively trying to bypass the constraint;
- Agents that are less limited by a constraint should be thriving in the economy.

These tests were applied to each node of the HRV tree to determine whether (and to what degree) a node was binding private sector investment and growth in El Salvador.

The United States' Partnership for Growth (PFG) effort elected to utilize a methodology known as Growth Diagnostics. Doing this study with a joint team comprised of representatives of two countries and linking it directly with subsequent public policy is powerful and innovative: It assures consensus among both parties not only regarding the programs in which the two governments will work together, but also regarding the underlying reasons for working in them. As a result, the probability for the success of these programs increases significantly.

Because the two governments have come to consensus regarding the methodology employed to evaluate the constraints to growth and because this is a very specific type of study, it is useful and necessary to preset a brief summary to clarify some characteristics of this methodology.

- The Growth Diagnostics methodology was created so that the executor of the methodology could, with the help of an evidence-based structure, prioritize the few most crucial factors, called “binding constraints”, from a multitude of factors that restrict economic growth in the country being studied. This is a significant advantage of this methodology for the PFG because it helps two countries focus their efforts on public policies on these crucial factors, using a strong base of evidence, to try to significantly and rapidly increase economic growth in the country.
- This tool is designed to identify the binding constraints of the economy as it exists today. Executing the methodology highlights the immediate obstacles which, if removed, could produce significant increases in economic growth now. Perspectives and analyses that look beyond the immediate future have to supplement a growth diagnostic to connect necessary, immediate objectives in the short term with medium- and long-term goals. It is important to think farther into the future with public policy plans even while public policies are being focused and directed towards removing today's binding constraints.
- For the PFG initiative, the principal goal is to achieve broad-based economic growth; the principal goal of this study was to identify the binding constraints that prevent economic

growth by way of private investment. The methodology and this study holds that sustainable economic growth is engendered by private investment. However, this focus does not imply that this is or should be the only important concern of public policy. There are many important goals for a developing country, broad-based economic growth being one.

- The purpose of this exercise was to identify binding constraints, not the reforms or actions necessary to remove them. There are probably many ways to fix a binding constraint, each with its own implications for the conduct of public policy. Our technical team wanted to leave, as much as possible, the decisions regarding what two governments working jointly together should do to remove those constraints to the appropriate decision makers.

There are many studies exploring the potential benefits and weaknesses of employing a growth diagnostic, including these:

Aghion, Philippe and Steven Durlauf (2007b). “Growth Regressions and Policy Evaluation”. Manuscript, Commission on Growth and Development.

Felipe, Jesus and Norio Usui (2008): “Rethinking the Growth Diagnostics Approach: Questions from the Practitioners”. Asian Development Bank. Version of February, 2008.

Hausmann, Ricardo, Bailey Klinger and Rodrigo Wagner (2008). “Doing Growth Diagnostics in Practice: A ‘Mindbook’”. CID Working Paper No. 177.

Hausmann, Ricardo, Dani Rodrik and Andrés Velasco (2004) ”Growth Diagnostics.” Harvard University.

Leipziger, Danny and Roberto Zaghera (2006): “Getting Out of the Rut”. *Finance and Development* (IMF). Vol. 43, No. 1.

Rodriguez, Francisco (2005): “Comment on Hausmann and Rodrik” *Journal of the Latin American and Caribbean Economic Association*, Vol. 6, No. 1, pp. 101-110.

Rodrik, Dani (2009). “Diagnostics Before Prescription”. Paper prepared for a Journal of Economic Perspectives Symposium on Development Economics.

### 3. An Economic Overview for El Salvador

#### A. Macroeconomic Situation

In its recent history, El Salvador has enjoyed macroeconomic stability and made progress in structural reforms introduced in the 1990's. In fact, since 1989, successive Salvadoran governments have implemented a number of economic, monetary and fiscal reforms designed to create stability and growth in the economy. The benefits of these reforms have been evidenced by average, annual real GDP growth of 4.7 percent from 1992 to 2000.

**Table 3.1: Macroeconomic Indicators of the Salvadoran Economy**

| Year | Per Capita GDP <sup>(1)</sup><br>(USD) | Real GDP growth rate<br>(percent) | Inflation<br>(percent) | Current Account<br>(Million USD) | International Reserves<br>(Million USD) | Net Barter Terms of Trade Index <sup>(2)</sup> |
|------|--|-----------------------------------|------------------------|----------------------------------|---|--|
| 2000 | 2,211.8                                | 2.2                               | 4.3                    | -430.5                           | 1,890.9                                 | 96.59  |
| 2001 | 2,315.0                                | 1.7                               | 1.4                    | -150.3                           | 1,709.5                                 | 98.34  |
| 2002 | 2,388.8                                | 2.3                               | 2.8                    | -405.1                           | 1,588.8                                 | 96.99  |
| 2003 | 2,504.3                                | 2.3                               | 2.5                    | -702.2                           | 1,905.8                                 | 91.18  |
| 2004 | 2,621.1                                | 1.9                               | 5.4                    | -641.9                           | 1,888.3                                 | 87.32  |
| 2005 | 2,825.7                                | 3.6                               | 4.3                    | -621.6                           | 1,829.4                                 | 87.05  |
| 2006 | 3,054.2                                | 3.9                               | 4.9                    | -765.6                           | 1,907.2                                 | 83.86  |
| 2007 | 3,296.6                                | 3.8                               | 4.9                    | -1216.6                          | 2,197.5                                 | 76.68  |
| 2008 | 3,499.1                                | 1.3                               | 5.5                    | -1532.2                          | 2,540.9                                 | 79.26  |
| 2009 | 3,358.1                                | -3.1                              | -0.2                   | -304.2                           | 2,984.8                                 | 80.30  |
| 2010 | 3,431.1                                | 1.4                               | 2.1                    | -488.3                           | 2,882.1                                 | 74.84  |

(1) Current USD

(2) The Net Barter ToT Index is an annual coincident Laspeyres chained index, i.e. with a mobile base year.

Source : Reserve Central Bank of El Salvador

From 2001 to 2004, real GDP grew by just 2.1 percent and was affected by two earthquakes, flooding and drought and increasing oil prices. From 2005 to 2007, the growth rate increased to 3.8 percent, which was accompanied by an acceleration of inflation, although inflation rates remained below 5 percent. The current account deficit also deepened from 2005 to 2007, since growth recovery incentivizes imports. Financing of the current account deficit was sufficient and also allowed the country to accumulate net international reserves, amounting to USD1,907

million in 2006 and increasing nearly one billion dollars to USD2,882.1 million at the end of 2010.

With the global economic crisis, El Salvador's economy slowed and contracted in 2008 and 2009. Real GDP growth in 2008 was 1.3 percent as consumption slowed with a reduction in remittances and weaker activity in the local economy. Fixed capital formation decreased by 5.4 percent due to a 7.4 percent drop in private sector investment that was partially offset by an increase in public sector investment of 10.5 percent. Real exports of goods and services increased by 6.9 percent, and real imports of goods and services increased by 3.3 percent.

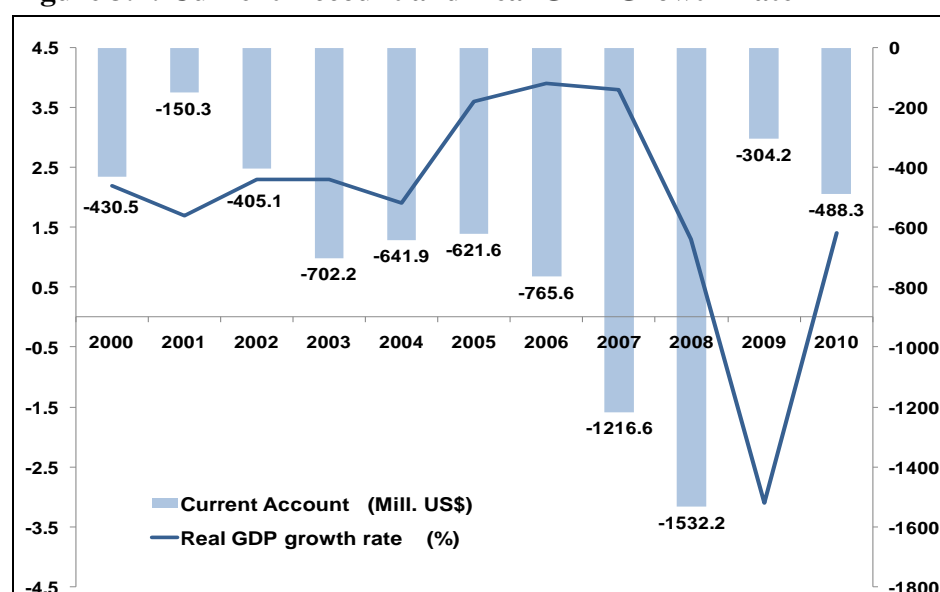
Real GDP contracted by 3.1 percent in 2009. Almost all sectors contracted in 2009, particularly the mining sector, which registered a 15.4 percent decline, and finance and insurance, which registered a 5.4 percent decline. Since imports declined that year, the current account deficit decreased to USD304.2 million, and capital flows financing this deficit allowed net international reserves to increase by USD444 million.

After shrinking by 3.1 percent in 2009, the Salvadoran economy recovered by 1.4 percent in real terms in 2010. Despite weak domestic demand, inflation reached 2.1 percent due to the impact of storms in October on some agricultural prices, which occurred concurrently with reductions in energy subsidy rates in the same month. As for the external sector, the current account registered a deficit of 2.3 percent. The current account deficit growth of almost 1 percent in terms of GDP, compared with that reported in 2009 (1.5 percent of GDP) was the result of rising oil prices, relative improvement in import demand and a slowdown in remittance flows.

The improvement in economic performance, coupled with the effect of the tax reform of 2009 and advances in the targeting of subsidies, has resulted in a reduction of the public sector deficit from 5.7 percent of GDP in 2009 to 4.3 percent of GDP in 2010.



**Figure 3.2: Current Account and Real GDP Growth Rate**



Source : Reserve Central Bank of El Salvador

Some recent government reforms include:

- Dollarization of the economy, which went into effect on January 1, 2001, fixing the *colón* (SVC) to the U.S. dollar (USD) at SVC8.75 to USD1.00, allowing free circulation of the U.S. dollar in the Salvadoran economy, and making the U.S. dollar the unit of account for El Salvador's financial sector. These reforms were intended to permanently stabilize the value of the *colón* against the U.S. dollar, reduce interest rates, increase the local savings rate, control inflation, encourage foreign investment, and simplify the management of the economy. For all practical purposes, the *colón* no longer circulates as currency in the country.
- Encouraging the establishment of free trade zones by eliminating certain tariffs and adopting laws allowing unrestricted repatriation of earnings by foreign companies, while providing rebates for duties on certain exports.
- Implementing new free trade agreements (FTAs) with Mexico, Chile, the Dominican Republic, Panama, Taiwan, Colombia and the United States. El Salvador also entered into the U.S.-Dominican Republic-Central America Free Trade Agreement (CAFTA-DR) with the United States, and entered an association agreement with European Union in 2010.
- Modernizing the banking sector in El Salvador through the privatization of commercial banks and savings and loan associations in order to promote competition and the development of a stronger financial system. Currently there are 12 banking institutions, 10 of which are foreign-owned banks and 2 of which are state-owned banks. There are no private domestic banks in El Salvador.

- Reforming the pension system with the creation of a new system, when a substantial portion of the public “pay-as-you-go” pension system was replaced by a private system based on individual contributions.
- Implementing a series of tax reforms, including the introduction of the value added tax (VAT) in 1992 and an increase in the VAT rate from 10 percent to 13 percent in 1995. Subsequent tax reforms were implemented in 2004 and 2009 aimed at closing loopholes, strengthening tax and customs administration, widening the tax base, increasing the penalties under the tax code for violations of the value added tax and income tax provisions as well as the applicable penalties under the Penal Code and Civil Code, and introducing penalties for customs violations.
- Continuing to modernize public sector institutions, reducing the size of the central government by decreasing the public sector workforce and combining ministries.
- Promoting tourism by enacting laws and regulations to foster the development of the tourism sector, and using revenue from taxes on lodging and airport departures to develop the tourism sector. These revenues go to the Ministry of Tourism in order to fund the promotional activities of the sector, among other activities.
- Investing in infrastructure projects, including the construction of a major port facility at La Unión, completed in 2008; the construction and expansion of the thermal power plant in Atéos to generate an additional 50 megawatts (MW), completed in 2008; the construction of a 66MW hydroelectric plant known as “El Chaparral”, expected to be completed in 2014; and a highway in the northern region of the country that will connect the eastern region with the western region of the Republic, expected to be completed in 2012.
- Implementing the *Plan Nacional de Educación 2021* (the “2021 National Education Plan”), a comprehensive education plan which will improve school facilities, provide greater access to computers and the Internet, and establish technological institutes. In addition, the *Programa Red Solidaria* (currently known as *Comunidades Solidarias Rurales*, “Mutual Aid Communities”) provides monetary assistance to rural families that enroll their children in school, among other things. In 2009, the Mutual Aid Communities expanded its coverage to urban areas in poverty.

## B. Production

**Table 3.3: Gross Domestic Product by Sector (as percent of real GDP)**

| Year | Agriculture,<br>Livestock,<br>Forestry &<br>Fishing<br>(percent) | Mining<br>(percent) | Manufacturing<br>(percent) | Electricity,<br>Gas &<br>Water<br>(percent) | Construction<br>(percent) | Services<br>(percent) |
|------|--|---------------------|----------------------------|---|---------------------------|-----------------------|
| 1990 | 17.1   | 0.4                 | 21.7                       | 1.2   | 3.5                       | 56.2                  |
| 2000 | 12.3   | 0.4                 | 23.0                       | 0.6   | 3.6                       | 60.1                  |
| 2001 | 11.8   | 0.4                 | 23.6                       | 0.6   | 3.9                       | 59.8                  |
| 2002 | 11.5   | 0.4                 | 23.7                       | 0.7   | 4.0                       | 59.7                  |
| 2003 | 11.4   | 0.5                 | 23.7                       | 0.7   | 4.1                       | 59.8                  |
| 2004 | 11.5   | 0.4                 | 23.5                       | 0.7   | 3.6                       | 60.4                  |
| 2005 | 11.7   | 0.4                 | 23.0                       | 0.7   | 3.6                       | 60.6                  |
| 2006 | 11.9   | 0.4                 | 22.7                       | 0.7   | 3.7                       | 60.7                  |
| 2007 | 12.4   | 0.4                 | 22.4                       | 0.7   | 3.3                       | 60.9                  |
| 2008 | 12.6   | 0.3                 | 22.6                       | 0.7   | 3.0                       | 60.8                  |
| 2009 | 12.6   | 0.3                 | 22.6                       | 0.7   | 3.0                       | 60.7                  |
| 2010 | 12.9   | 0.2                 | 22.8                       | 0.7   | 2.8                       | 60.6                  |

*Source : Reserve Central Bank of El Salvador*

After centuries of dependence on agricultural products, the Salvadoran economy has come to rely on the service sector and manufacturing activity, which accounted for 60.6 percent and 22.8 percent of constant GDP in 2010, respectively. From 1990 to 2010, the agricultural sector reduced its share of GDP from 17.1 percent to 12.9 percent and the services sector increased its share from 56.2 percent of GDP to 60.6 percent. Manufacturing has maintained its share around 23 percent in the same period.

The main components of the services sector are: (a) Commerce, restaurants and hotels (32.8 percent of total services in 2010); (b) Transportation, storage and communication (15.6 percent) and; (c) Residential leasing (13.2 percent).

From 2000 to 2010, government services maintained a moderate share of GDP, in line with budgetary discipline pursued with fiscal reform and expenditure constraints, from 9.1 percent of GDP in 2000 to 8.3 percent in 2010. The finance and insurance sector maintained its share at around 6 percent of GDP, growing at the same rate as the overall economy, while the transportation, storage and communications sector increased its share from 14.1 percent of GDP in 2000 to 15.6 percent of GDP in 2010.

**Table 3.4: Participation of Sub-sectors within the Service Sector, 2000-2010**  
(percent of total service real GDP)

| Sector  | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|------|------|------|------|------|------|------|------|------|------|------|
| Commerce, restaurants and hotels                  | 33.1 | 33.4 | 33.2 | 33.2 | 33.0 | 33.4 | 33.6 | 33.7 | 33.6 | 32.9 | 32.8 |
| Transportation, storage and communications        | 14.1 | 14.6 | 15.0 | 15.1 | 15.5 | 15.9 | 16.3 | 16.4 | 16.1 | 15.7 | 15.6 |
| Finance and Insurance                             | 6.4  | 6.4  | 6.3  | 6.3  | 6.4  | 6.3  | 6.3  | 6.2  | 6.1  | 5.9  | 6.1  |
| Real estate and business service activities       | 5.3  | 5.4  | 5.4  | 5.3  | 5.3  | 5.3  | 5.3  | 5.3  | 5.4  | 5.6  | 5.7  |
| Residential leasing                               | 13.9 | 13.4 | 13.6 | 13.7 | 13.5 | 13.3 | 13.0 | 12.8 | 12.8 | 13.3 | 13.2 |
| Community, social, personal and domestic services | 8.5  | 8.3  | 8.3  | 8.1  | 8.1  | 7.7  | 7.7  | 7.7  | 7.8  | 8.1  | 8.2  |
| Government services                               | 9.1  | 9.0  | 8.6  | 8.4  | 8.2  | 8.0  | 7.8  | 7.7  | 7.8  | 8.2  | 8.3  |
| Other service activities                          | 9.5  | 9.6  | 9.7  | 9.8  | 10.0 | 10.0 | 10.0 | 10.1 | 10.3 | 10.3 | 10.2 |

Source : Reserve Central Bank of El Salvador

**Table 3.5: Participation of Sub-sectors within the Manufacturing Sector, 2000-2010**  
(percent of total manufacturing GDP)

| Sector  | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|------|------|------|------|------|------|------|------|------|------|------|
| <i>Maquila</i> (assembly for re-export)               | 13.0 | 13.3 | 13.3 | 13.5 | 13.0 | 11.9 | 11.0 | 9.8  | 9.9  | 9.4  | 9.9  |
| Chemicals   | 8.4  | 8.4  | 8.4  | 8.5  | 8.5  | 8.6  | 8.6  | 8.8  | 9.0  | 9.7  | 9.6  |
| Baked goods   | 8.4  | 8.6  | 8.4  | 8.6  | 8.8  | 9.0  | 9.3  | 9.6  | 9.6  | 9.5  | 9.6  |
| Beverages   | 8.7  | 8.8  | 8.6  | 8.2  | 8.3  | 8.3  | 8.2  | 8.3  | 8.4  | 8.6  | 8.5  |
| Sugar   | 7.1  | 7.0  | 6.7  | 7.0  | 7.3  | 7.5  | 7.3  | 7.4  | 7.3  | 7.6  | 7.6  |
| Other processed foods                                 | 6.4  | 6.5  | 6.8  | 6.8  | 6.9  | 6.9  | 7.1  | 7.1  | 7.0  | 7.4  | 7.6  |
| Printing and related industries                       | 4.7  | 4.9  | 5.2  | 5.3  | 5.5  | 5.6  | 5.5  | 5.8  | 5.8  | 5.9  | 5.6  |
| Metallic mineral products                             | 4.5  | 4.5  | 4.5  | 4.5  | 4.7  | 4.8  | 4.7  | 4.7  | 4.8  | 4.8  | 4.9  |
| Refined oil products                                  | 5.0  | 5.1  | 5.0  | 4.9  | 4.6  | 4.7  | 4.8  | 5.0  | 4.9  | 3.9  | 3.4  |
| Textiles  | 5.8  | 5.2  | 5.0  | 4.8  | 4.8  | 5.1  | 5.1  | 5.2  | 5.2  | 5.4  | 5.4  |
| Non-metallic mineral products                         | 4.3  | 4.5  | 4.8  | 4.7  | 4.2  | 4.2  | 4.4  | 4.3  | 4.4  | 4.2  | 4.0  |
| Leather and related products                          | 3.9  | 3.8  | 3.6  | 3.6  | 3.7  | 3.7  | 3.7  | 3.9  | 3.9  | 3.9  | 3.8  |
| Transport supplies and diverse manufacturing products | 3.6  | 3.5  | 3.6  | 3.6  | 3.6  | 3.5  | 3.6  | 3.5  | 3.5  | 3.6  | 3.6  |
| Paper and cardboard                                   | 2.5  | 2.6  | 2.8  | 2.9  | 2.9  | 2.9  | 3.0  | 3.1  | 3.0  | 3.2  | 3.4  |
| Milk products   | 3.0  | 3.0  | 3.0  | 3.0  | 3.1  | 3.1  | 3.1  | 3.2  | 3.1  | 3.1  | 3.1  |
| Machinery and equipment                               | 3.2  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.2  | 2.8  | 2.8  | 2.7  | 2.7  |
| Plastic products                                      | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  | 2.5  | 2.5  | 2.6  | 2.5  | 2.5  | 2.5  |
| Meat packaging and related products                   | 1.9  | 1.9  | 1.8  | 1.7  | 1.7  | 1.7  | 1.7  | 1.8  | 1.7  | 1.7  | 1.7  |
| Apparel   | 2.0  | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8  |
| Lumber and related products                           | 1.2  | 1.2  | 1.2  | 1.2  | 1.2  | 1.2  | 1.2  | 1.2  | 1.2  | 1.2  | 1.2  |
| Other   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

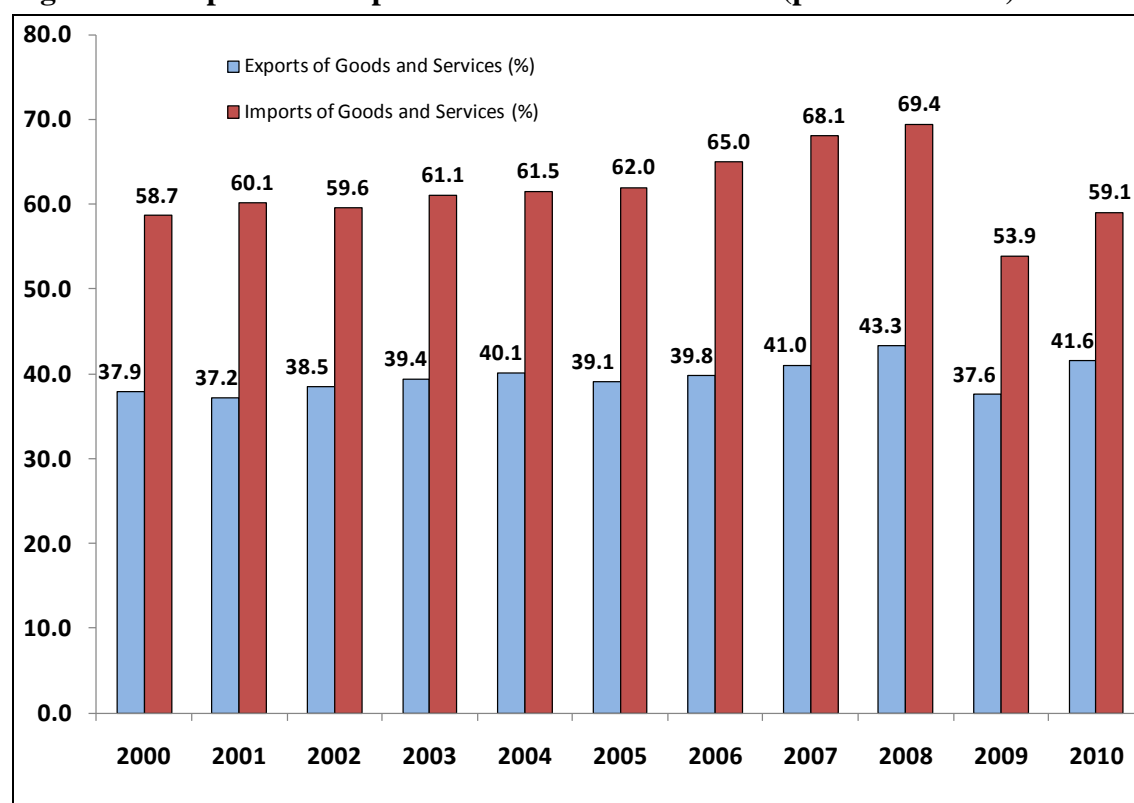
Source : Reserve Central Bank of El Salvador

Within the manufacturing sector, *maquila* activity (assembly for re-export) is the most important, accounting for 9.9 percent of sectoral value added in 2010. Chemical manufacturing is the next-largest subsector, reaching a 9.6 percent share in 2010. Baked goods, beverages, sugar, and other processed foods are also significant contributors to the manufacturing sector.

## C. Trade in Goods

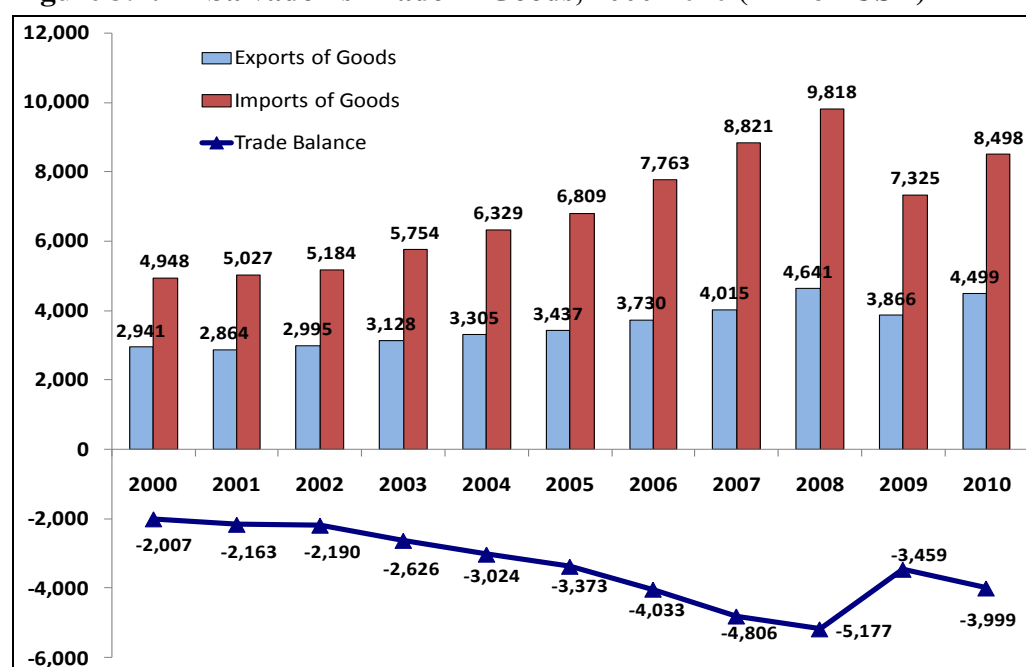
El Salvador has traditionally had an open economy, and this characteristic has deepened in the last decade. For instance, imports as a share of GDP steadily increased from 58.7 percent in 2000 to 69.4 percent in 2008, while exports' share of GDP increased from 37.9 percent to 43.3 percent in the same period. After deterioration of international trade following the global crisis, in 2009 exports represented 37.6 percent of GDP, and imports 53.9 percent of GDP, since exports and imports declined amid the international crisis. In 2010, El Salvador's main trade partners' recovery helped boost the trade sector, allowing exports to reach 41.6 percent of GDP, and imports 59.1 percent of GDP.

**Figure 3.6: Export and Import Shares of Constant GDP (percent of GDP)**



Source : Reserve Central Bank of El Salvador

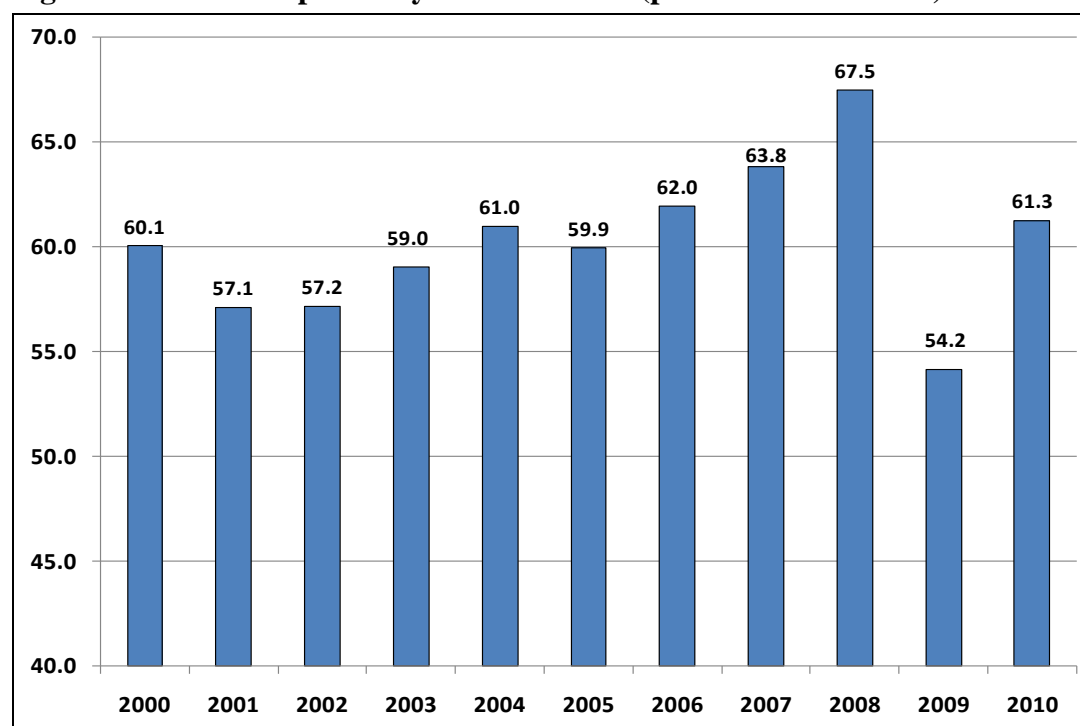
**Figure 3.7: El Salvador's Trade in Goods, 2000-2010 (million USD)**



Source : Reserve Central Bank of El Salvador

The trade dependency ratio increased from 60.1 percent of GDP in 2000 to 67.5 percent in 2008. As a consequence of the international financial crisis of 2009, that share reduced to 54.2 percent in 2009 and reached 61.3 percent in 2010. It is expected to recover to previous levels, since the country's major trade partners have shown higher growth in the past year.

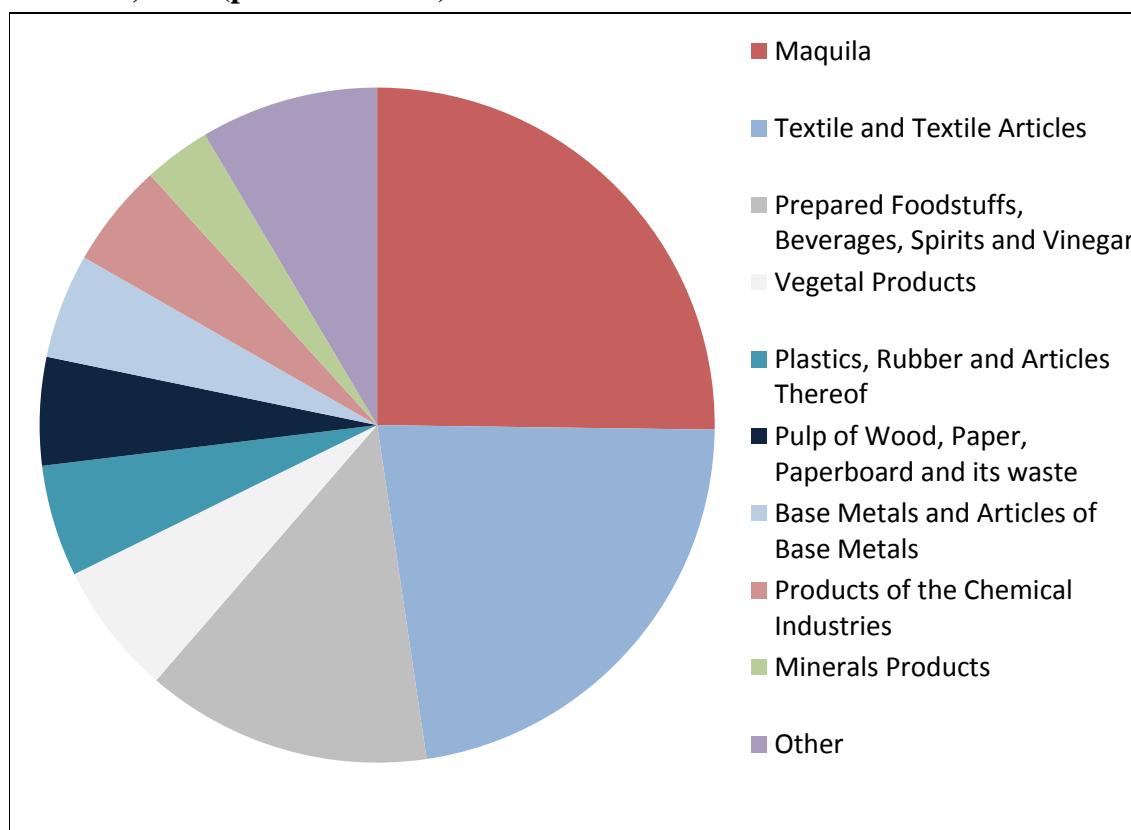
**Figure 3.8: Trade Dependency of El Salvador (percent of total GDP)**



Source : Reserve Central Bank of El Salvador

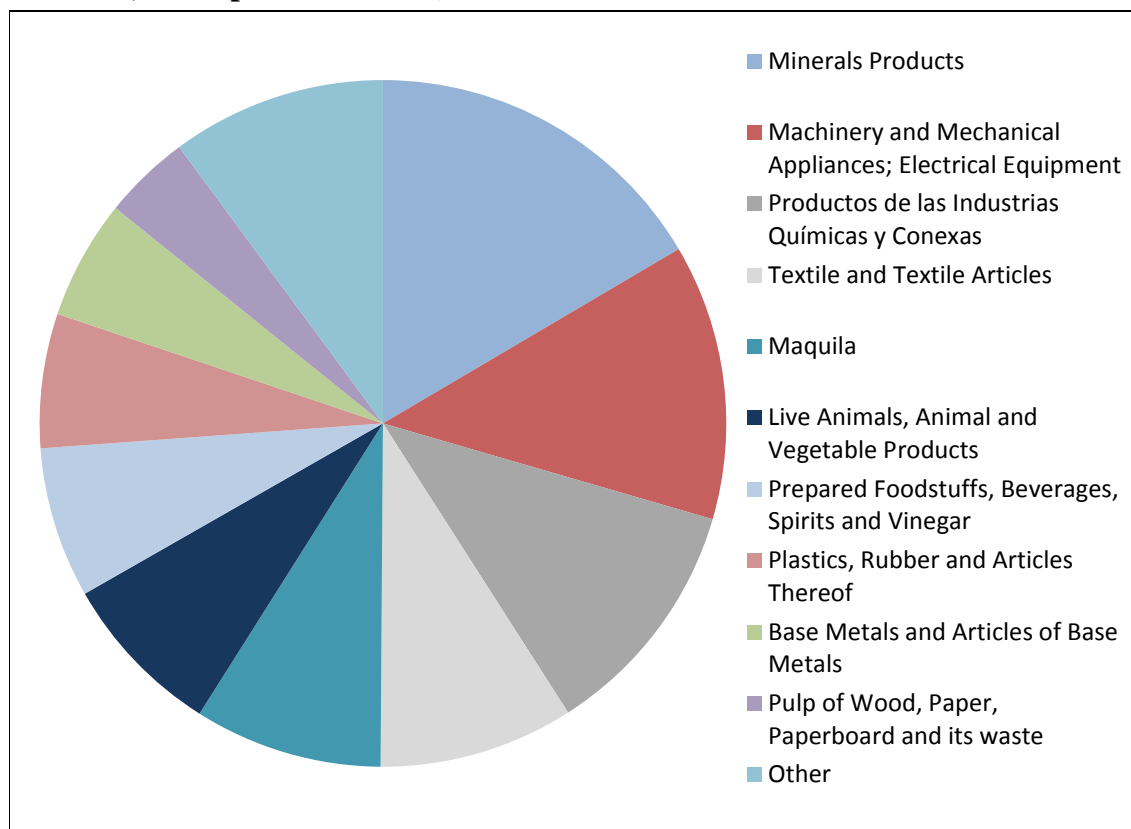
El Salvador's trade balance is in deficit because export growth has been less dynamic than import growth. From 2000 to 2008, the export of goods increased from USD2941 million to USD4641 million, while imports increased from USD4948 million to USD9818 million. This performance resulted in an increasing trade deficit, from USD2007 million to USD5177 million. The main reason for the trade deficit is the inflow of worker remittances from the United States, which has allowed the country to access more foreign goods. In 2009, exports, imports and the trade deficit shrank as a result of the recessionary effects of the global economic crisis. In 2010, the deficit increased as imports regained growth, ahead of domestic growth recovery at 1.4 percent.

**Figure 3.9: El Salvador's Exports by Sector according to the Central American Tariff Schedule, 2010 (percent of total)**



Source: Central Reserve Bank of El Salvador

**Figure 3.10: El Salvador's Imports by Sector according to the Central American Tariff Schedule, 2010 (percent of total)**



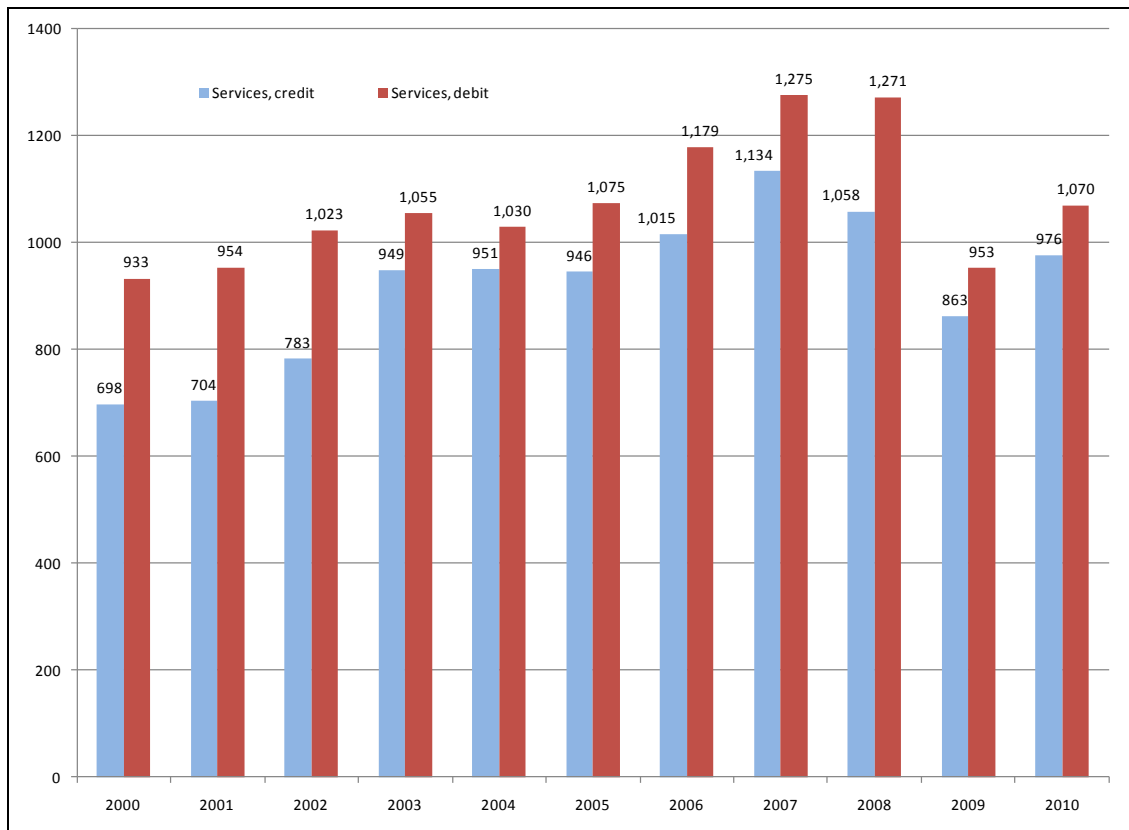
Source: Central Reserve Bank of El Salvador

## D. Trade in Services

El Salvador has a deficit in service trade, since imports have been larger than exports. From 2000 to 2008, service exports increased from USD698 million to USD1.06 billion, while imports grew from USD933 million to USD1.27 billion. The deficit reduced slightly from USD235 million to USD213 million in the same period. In 2009 and 2010, service exports, service imports and the deficit all shrank to less than USD 100 million as a consequence of the recessionary effects of the crisis.



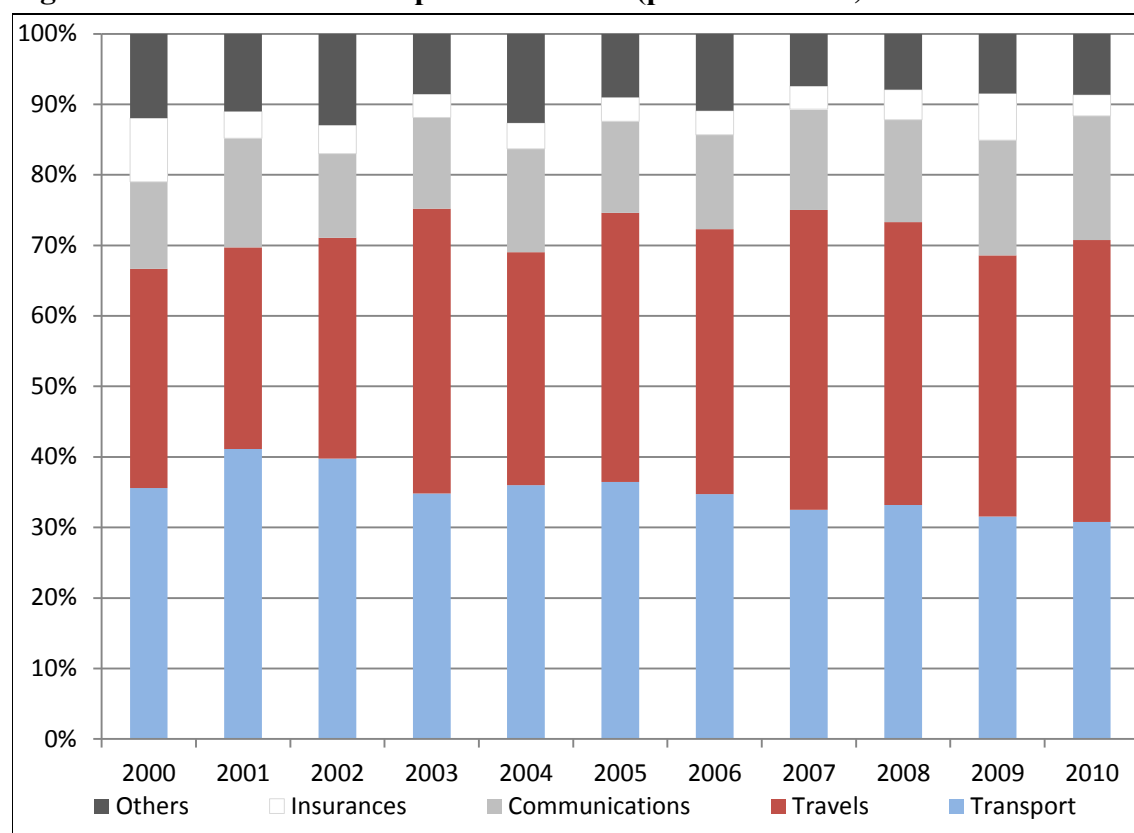
**Figure 3.11: El Salvador's Trade in Service (million USD)**



Source : Reserve Central Bank of El Salvador

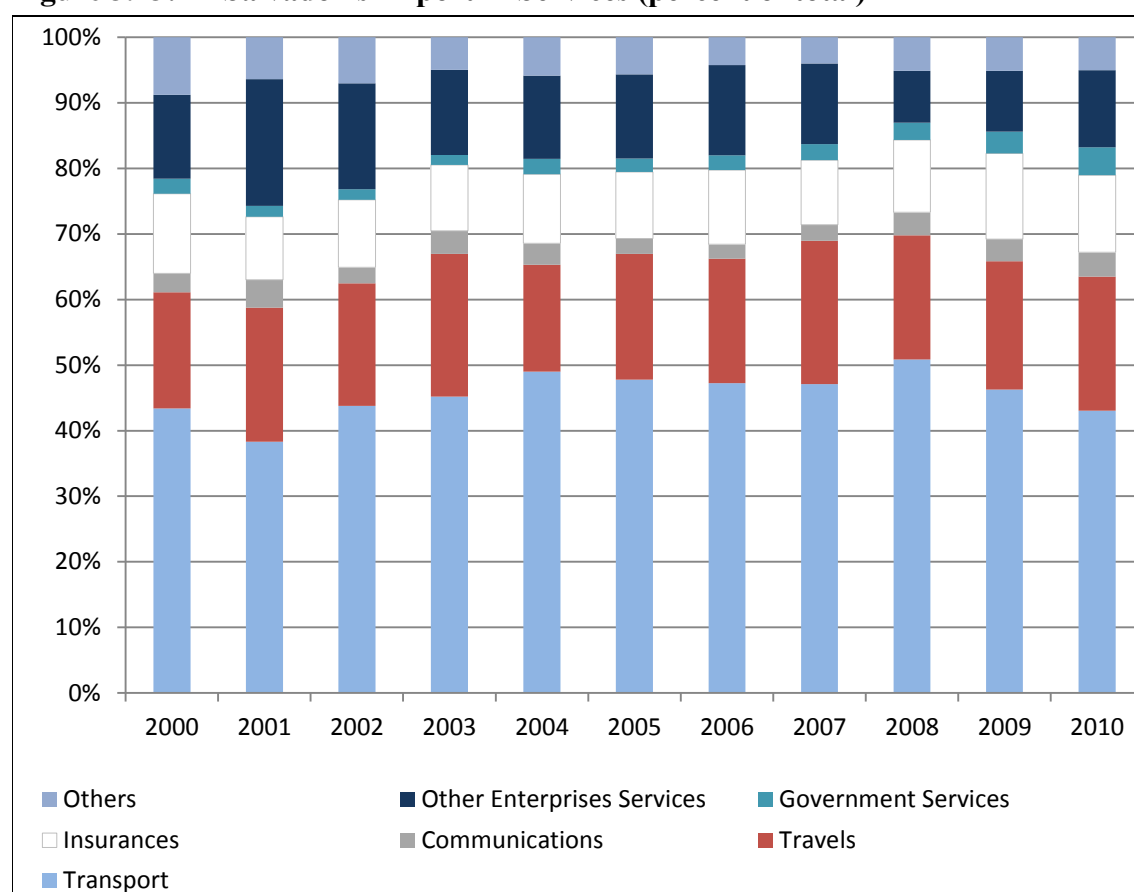
The primary services that El Salvador exports are transportation and travel services, which, combined, account for almost 73 percent of total export services. Travel services represented about 40 percent of the sector in 2010, transportation was roughly 31 percent, and communications was about 18 percent.

**Figure 3.12: El Salvador's Export in Services (percent of total)**



Source: Reserve Central Bank of El Salvador

**Figure 3.13: El Salvador's Import in Services (percent of total)**

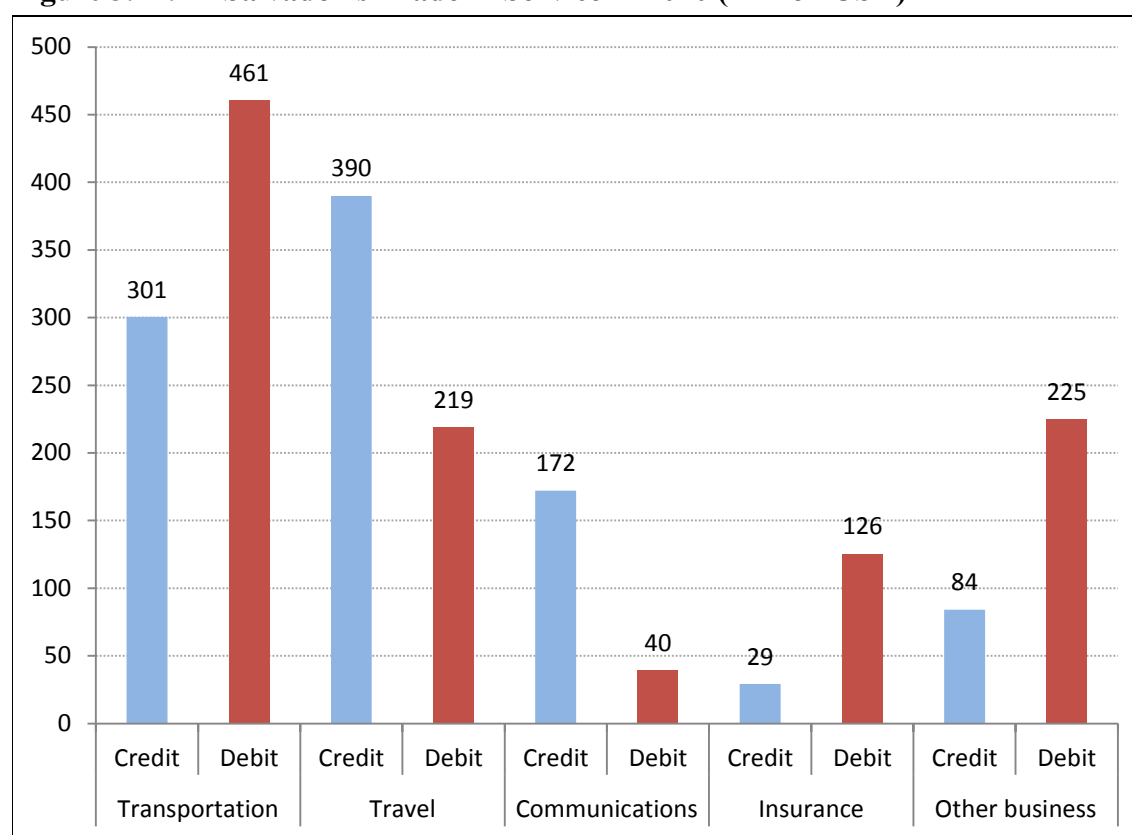


Source: Reserve Central Bank of El Salvador

The top three imported services are transportation, travel and insurance, accounting for 75 percent of total imported services. In 2010, the transportation import share was 43 percent, and the travel import share was 20.5 percent. Insurance services have been increasing and reached nearly 11.7 percent of imports in 2010.

In 2010, the service trade deficit amounted to USD94 million. This deficit is mainly explained by the USD160 million deficit in the transportation sector, and the USD96 million deficit in the insurance sector. The travel services surplus amounted to USD171 million, and the communication sector surplus was USD132 million. The total surplus was less than the deficit, creating a net trade deficit in the service sector.

**Figure 3.14: El Salvador's Trade in Service in 2010 (million USD)**

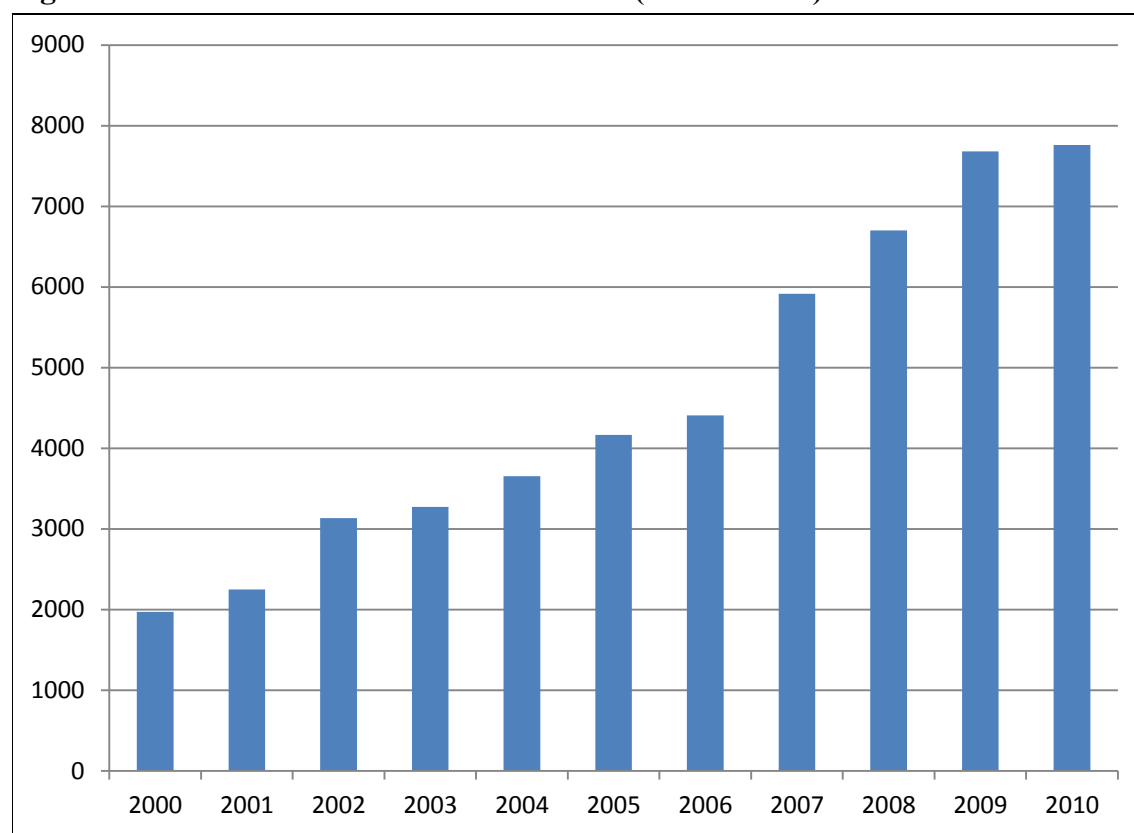


Source : Reserve Central Bank of El Salvador

## E. Foreign Direct Investment in El Salvador

The stock of foreign direct investment increased from USD1973 million in 2000 to USD7760 million in 2010, mainly directed to the financial and manufacturing industries, whose shares of total investment reached 36.0 and 21.6 percent for 2010, respectively. The industry receiving the third highest FDI was energy supply, with a share of 13.7 percent, and the fourth was wholesale and retail commerce, with 8.5 percent.

**Figure 3.15: El Salvador's Inward FDI Stock (million USD)**



Since 2009 includes information from "fellow enterprises", and reserves in the form of direct investment and investment data are presented on a net basis, the assets are deducted from the liabilities.

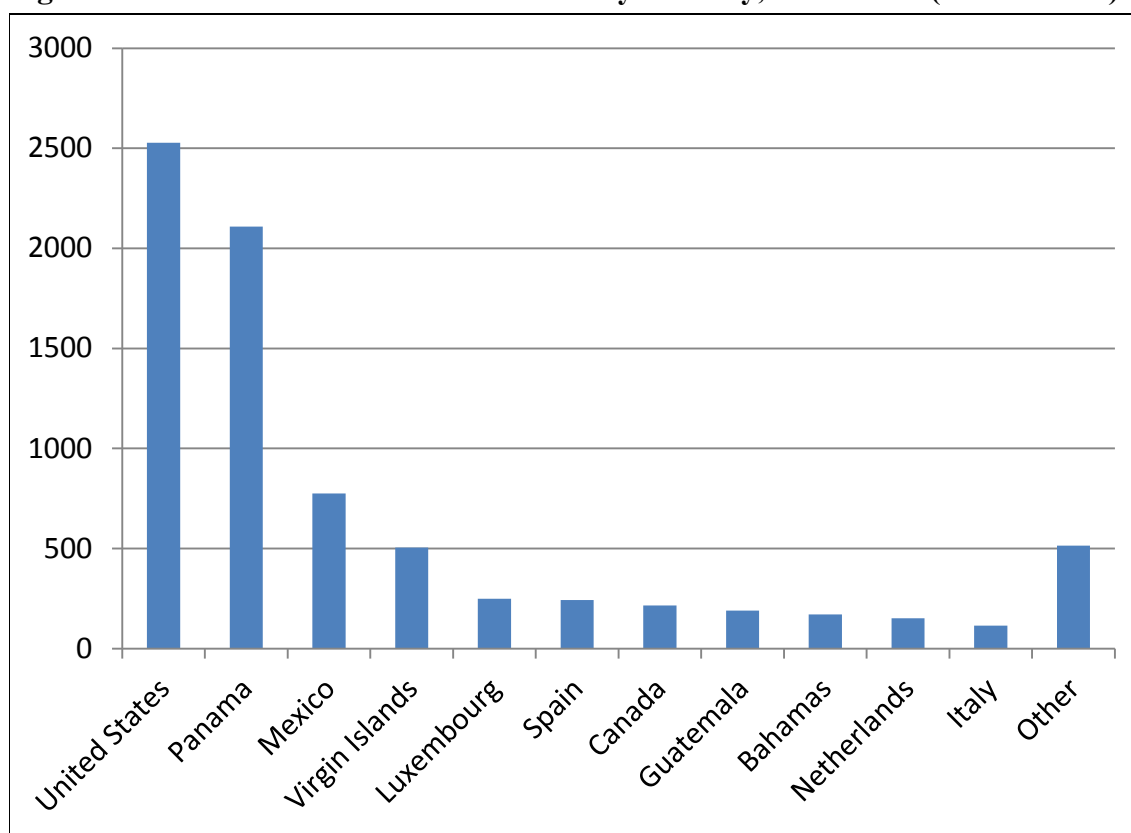
**Table 3.16: El Salvador's Net FDI by Receiving Economic Sector, Stock at end-2010 (million USD)**

| <u>Sector</u>                      | <b>Invested Amount<br/>(USD millions)</b> | <b>Share of total<br/>investment<br/>(percent)</b> |
|------------------------------------|---|--|
| Agricultural                       | 2.7                                       | 0.03   |
| Minery                             | 44.3                                      | 0.6  |
| Manufacturing Industries           | 1676.2                                    | 21.6   |
| Energy Supply                      | 1064.5                                    | 13.7   |
| Construction                       | 21.1                                      | 0.3  |
| Wholesale and Retail Commerce      | 662.7                                     | 8.5  |
| Transport and Storage              | 17.1                                      | 0.2  |
| Communications and Information     | 1248.6                                    | 16.1   |
| Financial and Insurance Activities | 2796.2                                    | 36.0   |
| Other Sectors                      | 226.6                                     | 2.9  |

Investment data are presented on a net basis, i.e. direct investment assets are deducted from liabilities.

Source : Reserve Central Bank of El Salvador

**Figure 3.17. El Salvador's Net Inward FDI by Country, 2010 Stock (million USD)**



*Source: Central Reserve Bank of El Salvador*

From a country of origin perspective, the largest amount of FDI came from the United States (USD2.53 billion), Panama (USD2.11 billion), and Mexico (USD775 million).

## 4. Cost of Finance

A necessary condition for investment is that the returns on investment should be higher than the interest rate. If investment as a percentage of the GDP is low (and it was an average of 15.3 percent from 1980-2009 in El Salvador)<sup>1</sup>, then it is expected that either private returns on investment are low, or interest rates are high (or there is rationing of credit).

In particular, long-term productive investment decisions are conditional to the marginal efficiency of the capital ( $Emc$ ) being higher than the interest rate ( $i$ ). That is to say, that the price of capital assets ( $pf$ ) depends on the expected flow of profits ( $U$ ) with regard to the marginal efficiency of the capital ( $U/Emc$ ). If marginal efficiency of capital is higher than the price of financial assets ( $i$ ), the price of capital goods ( $pf$ , or profit) would be normal, and capital production would continue. Minsky (2008) argues that the price of capital goods has a close relationship with the price of current production, because productive investment forms part of production.<sup>2</sup>

In the opinion of Hausmann (2004), capital yields in El Salvador are low, a situation that results in low investment with regard to GDP, and explains a low historical economic growth rate. Figure 4.1 confirms how capital productivity has been below the real deposit interest rate, discouraging investment. The margin of production of goods has fluctuated around real interest rates, therefore it is not profitable to engage in production.

---

<sup>1</sup> The Latin American average is 24.1 percent

<sup>2</sup> “The price of current output and all capital assets depend upon different variables and are determined in different markets. The prices however are linked, for investment output is part of current output” (Minsky 2008, 195-196). It then means that the price of the offer ( $P_0$ ) is equal to  $(1 + M) \frac{W}{a_c}$ .  $AC$  is the average productivity of labor.  $W$  is the wage rate in money and  $M$  is the mark up on per unit labor cost. The price of capital assets ( $P_K$ ), is re-written as  $= K(\pi_i)$ ,  $i=1, \dots, n$ . In which  $K$  is the function of capitalization.  $P_K$  and  $P_0$  are linked as investment goods, once produced, become capital assets.

**Figure 4.1: Real lending and deposit interest rates, capital productivity and profit margins of goods**

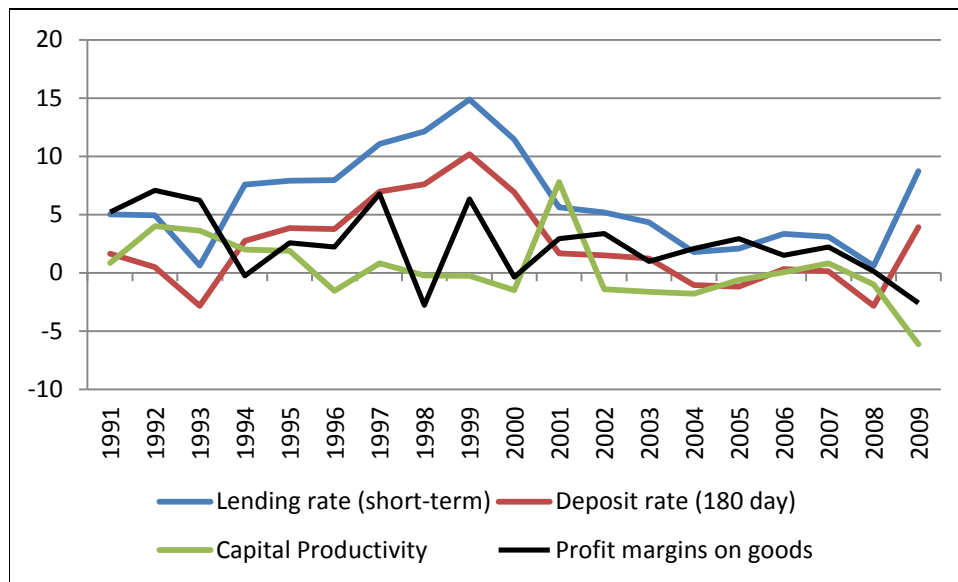
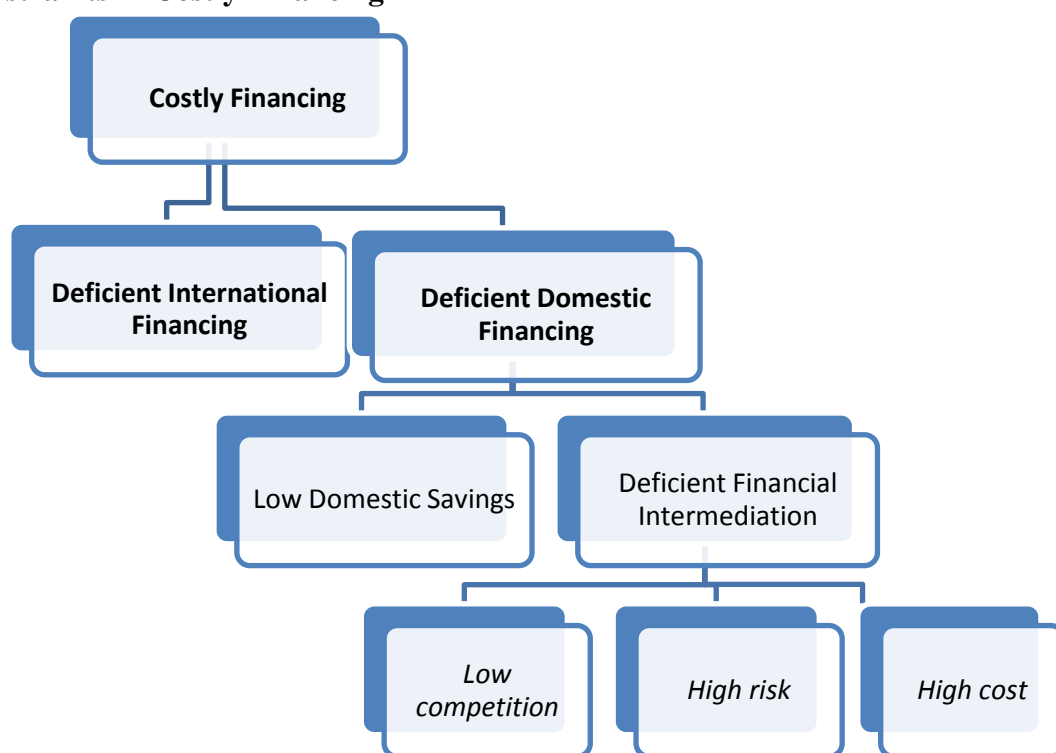


Fig. 4.2 illustrates how we will look at the node of finance: we will first examine whether it is the cost of finance or returns to economic activity that is more responsible for low investment, and then we will look at access to external finance and domestic savings; finally, we will look at financial intermediation and possible reasons for it being a constraint: low competition, high cost, or high risk. Financial intermediation is the work that banks and financial institutions do in collecting savings and deposits and lending them out to businesses and individuals in the economy.



**Figure 4.2: Constraints in Costly Financing**

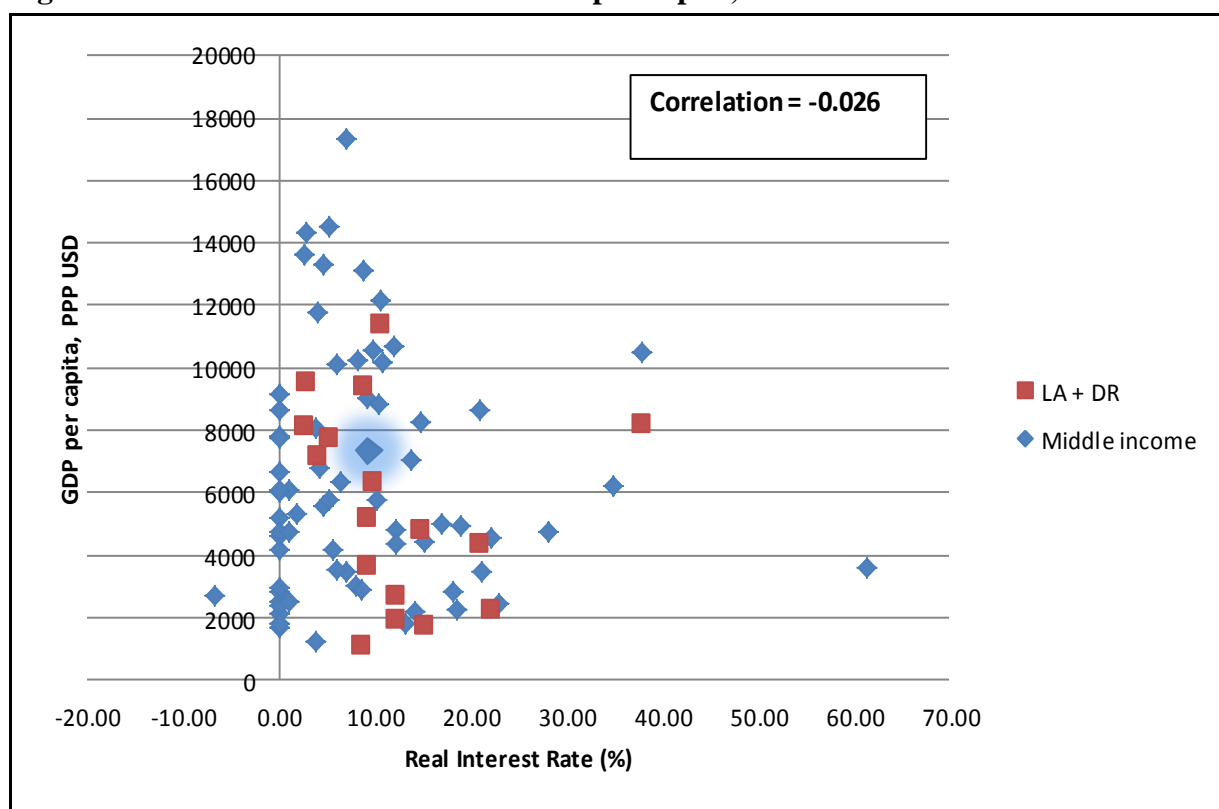


### **A. Interest Rates**

We begin with the first decision node on investment by considering the price of private investment: the real interest rate. The growth diagnostic approach suggests that if we find that the real interest rate is not abnormally high relative to historical values or comparator countries, we can infer that investment demand, and not investment supply (financing) may be the problem.

Figure 4.3 is a scatterplot of GDP per capita versus the real interest rate for El Salvador relative to comparator countries in Latin America (red squares) and the World Bank middle-income group (blue diamonds). Based on its income, El Salvador's real interest rate is squarely in the middle of the sample. As Table shows, El Salvador's real interest rate is not statistically different from that of its comparator countries, lying well within a standard deviation relative both to Latin America/Dominican Republic and middle-income countries.

**Figure 4.3: Real Rate of Interest and GDP per capita, 2009**



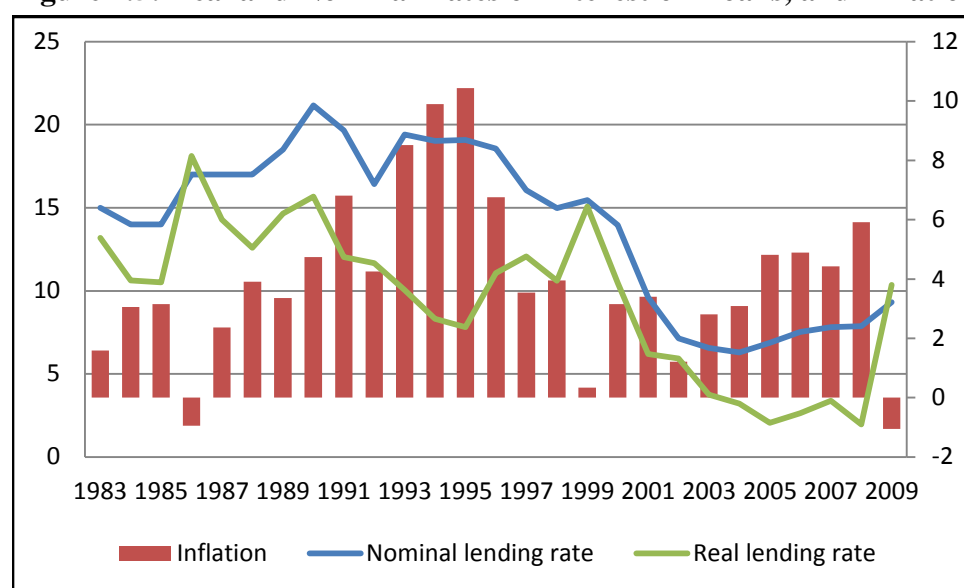
Source: World Development Indicators (2011) and Central Reserve Bank

**Table 4.4: Standard deviation of the real interest rate**

| El Salvador minus mean (in standard deviations) | 2005  | 2006 | 2007 | 2008 | 2009  |
|---|-------|------|------|------|-------|
| Latin America and the DR                        | -0.28 | 0.00 | 0.04 | 0.03 | -0.34 |
| Medium Income                                   | 0.06  | 0.44 | 0.33 | 0.72 | 0.05  |

Figure 4.5 juxtaposes the nominal and real lending rates over time, with bars identifying the rate of inflation. With the exception of the period immediately following the Peace Accords of 1992, and especially since the adoption of the U.S. dollar, El Salvador has experienced relatively low inflation. When linked to low interest rates, this has led to low real interest rates over time and in relation to comparator countries.

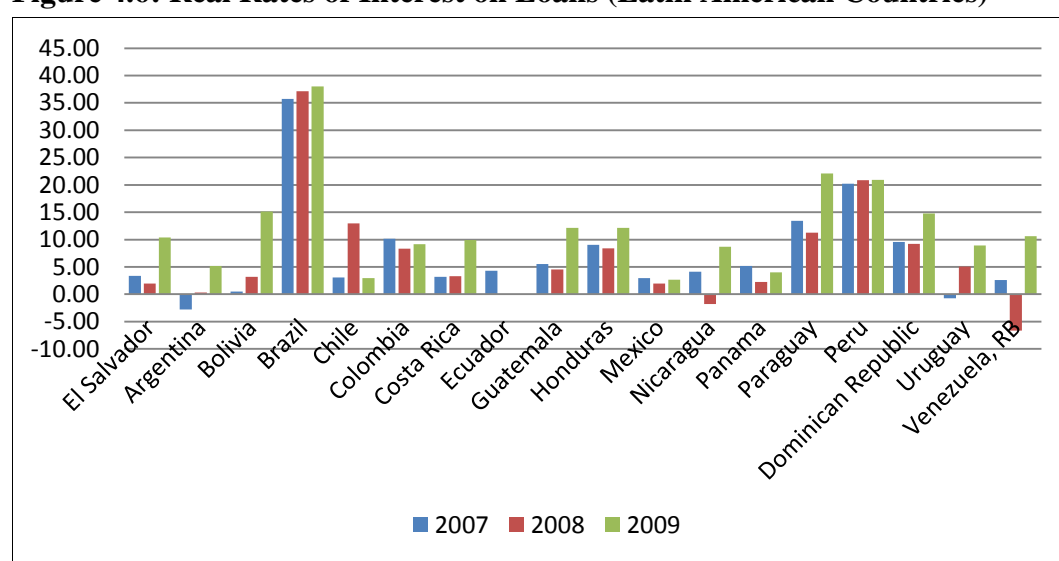
**Figure 4.5: Real and Nominal Rates of Interest on Loans, and Inflation**



Source: World Development Indicators (2011) and Central Reserve Bank

Figure 4.6 compares the real interest rate with that in other Latin American countries for 2007, 2008, and 2009.

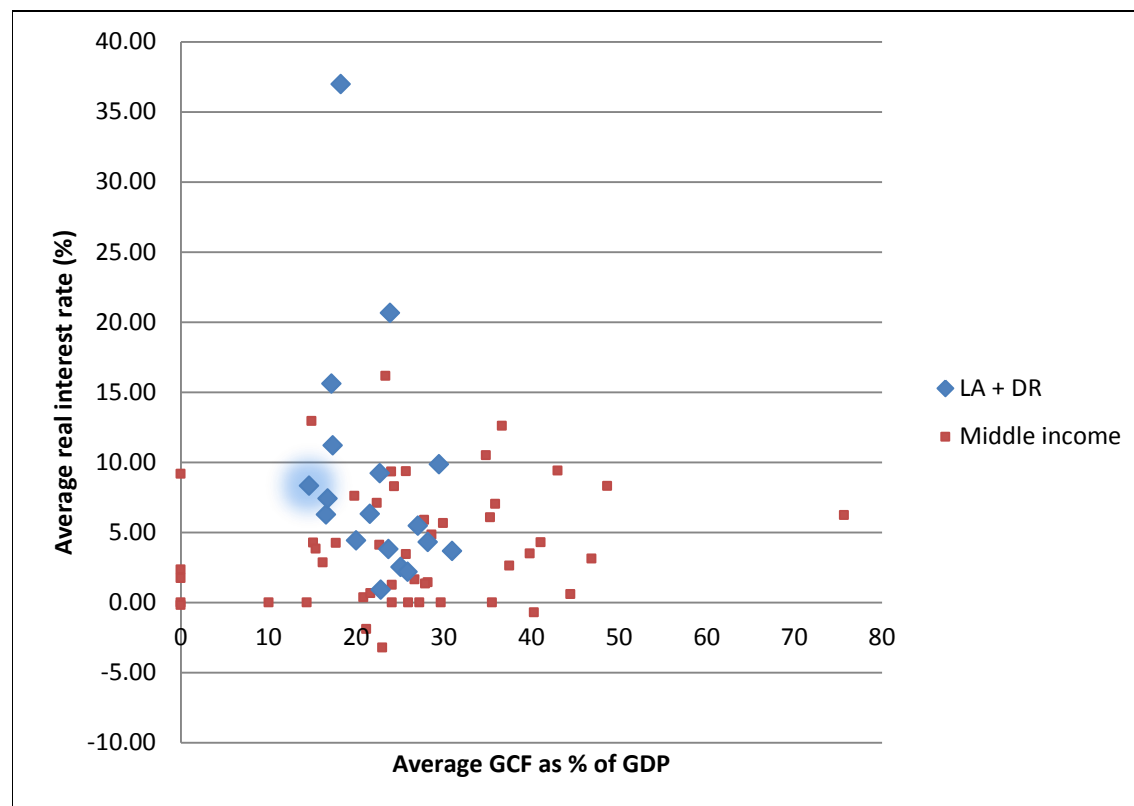
**Figure 4.6: Real Rates of Interest on Loans (Latin American Countries)**



Source: World Development Indicators (2011) and Central Reserve Bank

The relationship between interest rates and investment rates also can tell us about the level of investment demand in a country. Figure 4.7 juxtaposes average real interest rates and investment in a scatterplot of data from 2007 to 2009. Although El Salvador had an average real interest rate similar to those of Colombia and the Republic of Congo in 2007-2009, the investment share of GDP was significantly lower. This suggests that El Salvador has a lower investment demand curve, i.e. a fewer number of projects that can produce a certain rate of return.

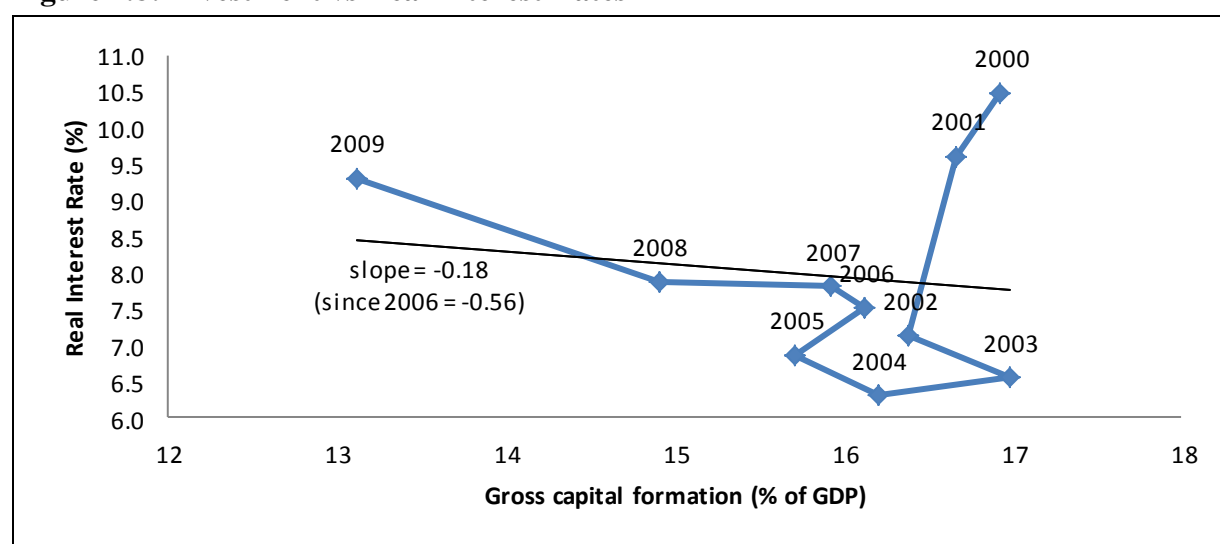
**Figure 4.7: Real Average Rates of Interest on Loans and Investment (Percentage of GDP) for Latin American Countries**



Source: World Development Indicators (2011) and Central Reserve Bank

Figure 4.8 displays graphically the relationship between investment and real interest rates. According to Hausmann et al (2008), access to finance is a binding constraint if a reduction in interest rates leads to an increase in the investment rates. As shown in Figure 4.8, the relationship between investment and real interest rates has formed a downward-sloping curve since 2006, suggesting that changes in the quantity of investment were affected primarily by supply shocks during that time. Note the rather small percentage change: a 1.5-percentage-point increase in the real interest rate from 2006 to 2009 led to only a 2.8-percentage-point drop in gross capital formation as a percentage of GDP. This evidence supports the conclusion that access to finance may be a binding constraint, but if so it affects only a small part of the economy. In addition, our analysis focuses on the posted interest rates, which may in fact only be available to a few prime borrowers, especially in developing countries.

**Figure 4.8: Investment vs Real Interest Rates**



Source: World Development Indicators

## B. Small and Medium Enterprise (SME) Credit

Access to credit for SMEs is an area commonly lacking reliable statistics such as interest rates or share of SME credit in most countries (IDB 2005, 187). According to the Inter-American Development Bank, “In general, there are four main causes of credit problems for small firms: fixed lending costs [for smaller loans], imperfect enforcement of credit contracts, bankruptcy costs, and asymmetric information” (IDB 2005, 191).

Fixed costs of lending to SMEs include assessing, monitoring and recovery. The cost per loan is higher than for larger loans if lenders use the same rating system and credit evaluation process. However, lending technology to SMEs of late has increased in specialization, which has produced greater efficiencies in granting loans to SMEs, and lower fixed costs.

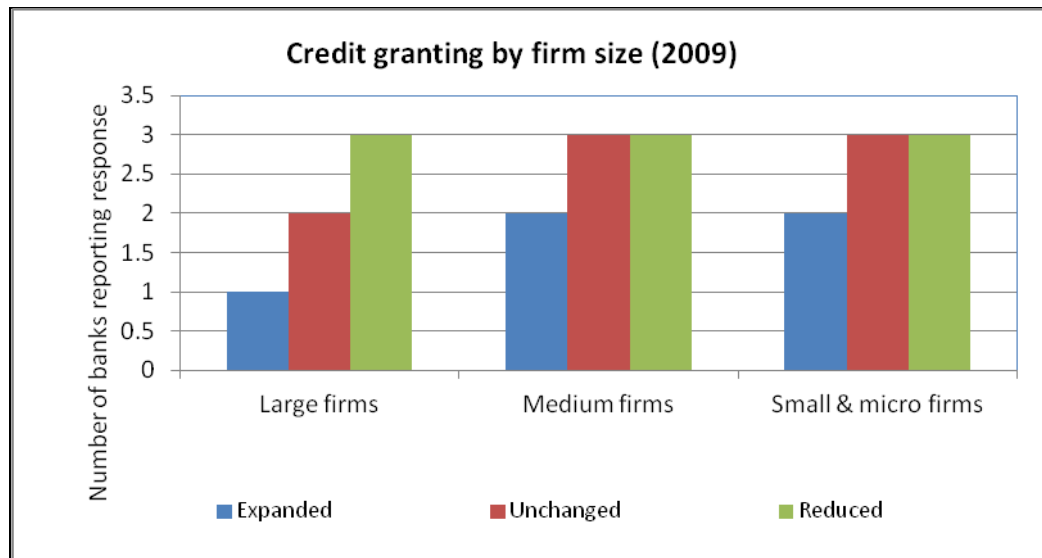
The imperfect enforcement of credit contracts increases bank losses in case of default. Hence, banks are unwilling to lend to SMEs without collateral that exceeds the loan amount. Regarding bankruptcy costs, according to the IDB, “Even without bankruptcy costs, it is reasonable to expect banks to charge a higher interest rate to firms with more leverage because, other things equal, banks will recover a smaller share of loans to such firms in the event of bankruptcy” (IDB 2005, 193).

Finally, there is the risk of asymmetric information, moral hazard and adverse selection. These raise information costs for the bank to understand the repayment capacity of SMEs and strengthen their system of risk measurement. One way banks get around this is using more collateral for the value of credit.

In the next section, we then focus our examination on the hypothesis that small and medium enterprises (SMEs) find credit to be a binding constraint to their investment and growth. This is important because micro firms and SMEs contribute roughly 43 percent of GDP and 65 percent of employment (MINEC 2005). The BCR's survey on credit market conditions shows that during 2009, SMES tended to be the ones suffering from the credit crunch (see Figures 4.9 and 4.10.)

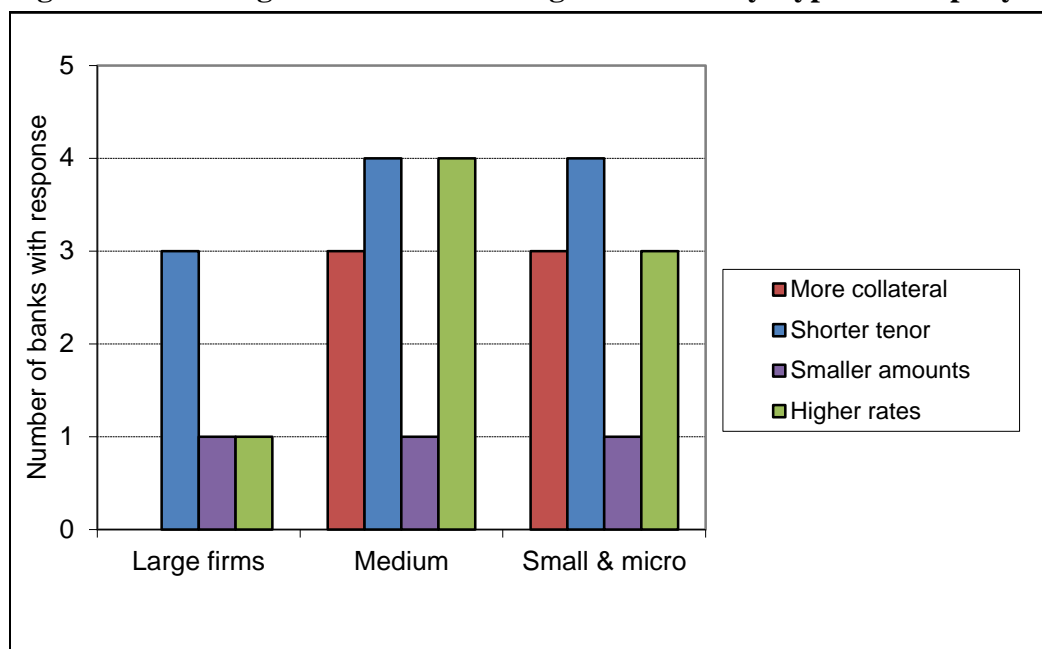
The Financial Sector Assessment (International Monetary Fund and The World Bank 2010, 20) maintains that some regulatory standards requirements also limit access to credit for the SMEs. These include requirements from the commercial code, tax code, and anti-money laundering regulations, which require the presentation of financial statements and proof of tax payments. There are standards that favor granting consumption credits over entrepreneurial credits, such as NCB-022 issued by the Superintendence of the Financial System.

**Figure 4.9: Banks' Granting of New Credit during 2009**



Source: Reserve Central Bank, 2010

**Figure 4.10: Changes to Credit Granting Conditions by Type of Company**



Source: Reserve Central Bank, 2010

The main changes that occurred during the crisis were shorter tenors, higher interest rates, and greater amounts of collateral, particularly for small and medium enterprises (SMEs) and microenterprises.

In the following section we apply the four tests of the HRV methodology for binding constraints, and conclude that in El Salvador, deficient intermediation in credit does not constitute a binding constraint for SMEs' investment.<sup>3</sup>

<sup>3</sup> The SSF defines micro firms as those with up to SVC 600,000 (USD68,580) in annual sales and up to 10 employees. Small firms have SVC 600,000-6m (USD68,580-685,500) in annual sales and 10-49 employees. Medium firms have SVC6m-40m (USD685,500-4.6m) in annual sales and 50-200 employees.

*The Shadow Price of the Constraint should be High*

**Table 1.11: Loan terms and amounts of commercial banks, cooperative banks and savings and loans associations**

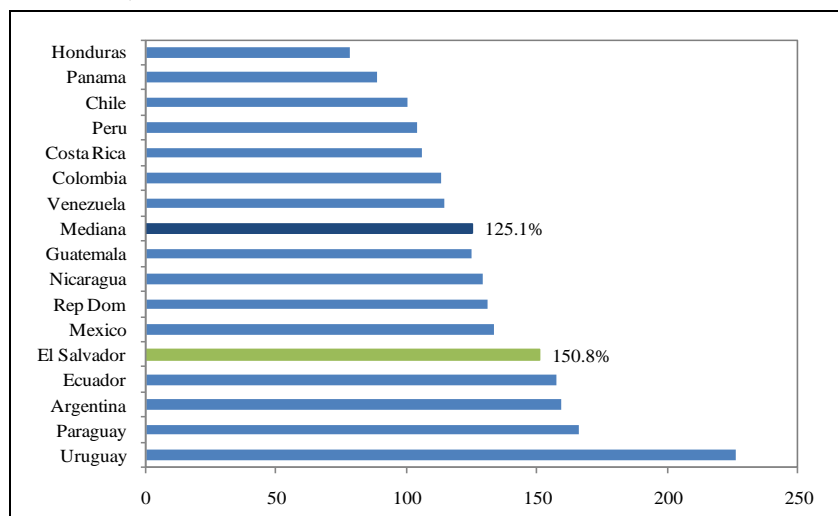
| <i>Loan terms</i>       | <i>March 2011</i> |
|-------------------------|-------------------|
| 6 months                |                   |
| <b>Up to \$1000</b>     | 20.03%            |
| <b>\$1000-\$5000</b>    | 11.53%            |
| <b>More than \$5000</b> | 6.35%             |
| 6-12 months             |                   |
| <b>Up to \$1000</b>     | 29.88%            |
| <b>\$1000-\$5000</b>    | 12.63%            |
| <b>More than \$5000</b> | 6.39%             |
| Longer than 12 months   |                   |
| <b>Up to \$1000</b>     | 22.47%            |
| <b>\$1000-\$5000</b>    | 14.04%            |
| <b>More than \$5000</b> | 7.97%             |

*Source: Reserve Central Bank, 2011*

As we can see from the current snapshot shown in Table 1.11 above, SMEs in El Salvador pay significantly higher interest rates for the same term than do larger borrowers (who presumably take out larger loans). However, comparator information on the interest premium that SMEs pay is not available for Latin America or other countries, especially since the definition of SMEs differs by country. Nonetheless, the implicit cost to access credit includes active rates and commissions and also includes the required collateral, which in the case of the small enterprise can go as high as 174 percent of the value of the credit. This is far above the requirement for medium and large enterprises and far exceeds the mean for the Latin American region (117 percent) (Figures 4.11 and 4.12).

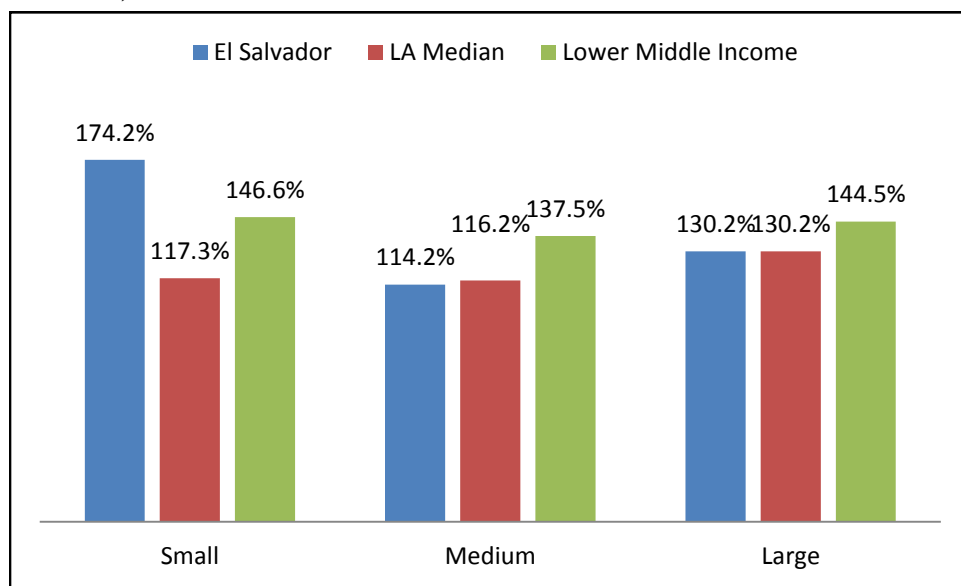


**Figure 4.11: Value of Collateral Necessary for Obtaining a Loan (as percent of Loan Amount )**



Source: (World Bank, Enterprise Survey 2006)

**Figure 4.12: Value of Collateral Necessary for Obtaining a Loan (as percent of Loan Amount)**



Source: World Bank Enterprise Survey 2006

The credit survey carried out by the BCR confirms that collateral requirements increased for micro, small and medium enterprises (MSMEs) during 2009. It would appear that lenders observe the higher credit risk of small firms and charge them accordingly. This is corroborated by anecdotal reports of commercial banks exiting the lending market for smaller firms (WB and IMF 2010). The general problems of delays in executing collateral through the legal system and lack of credit history are worse constraints for small firms compared to others (International Monetary Fund and The World Bank 2010), and yet they tend to have fewer assets to pledge than

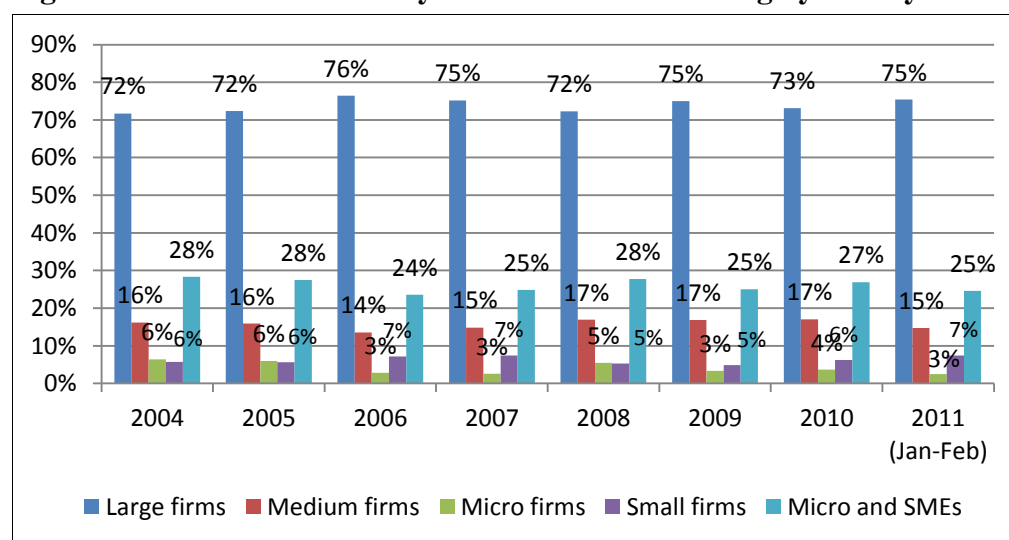
do larger firms. Net interest margins are also slightly higher for cooperative banks, who lend to consumers and SMEs, than for commercial banks (6 percent in 2009) (SSF data).

In short, borrowing costs are higher for small firms than for large firms, but it is not clear that this is worse than the situation faced in comparator countries.

### ***Movements in the constraint should produce significant movements in the objective function***

On average, only 22 percent of bank financing went to SMEs during the period 2004 to 2009, in comparison to 70 percent for large firms (See Figure 4.13). Information for SME borrowing costs over the same time period is not available, although we know that credit granted to SMEs hovered around 21-23 percent in 2004-2010 and that overall credit, as well as credit to SMEs, fell sharply in 2009 in response to the financial crisis and a doubling of overall real lending rates to 10 percent (Table 4.15 below). This reflects sharper contraction in credit relative to overall GDP, rather than something specific to SME credit, as shown by SME credit as share of total credit.

**Figure 4.13: Loans Granted by the Salvadoran Banking System by Share of Total**



Source: Superintendence of the Financial System 2010

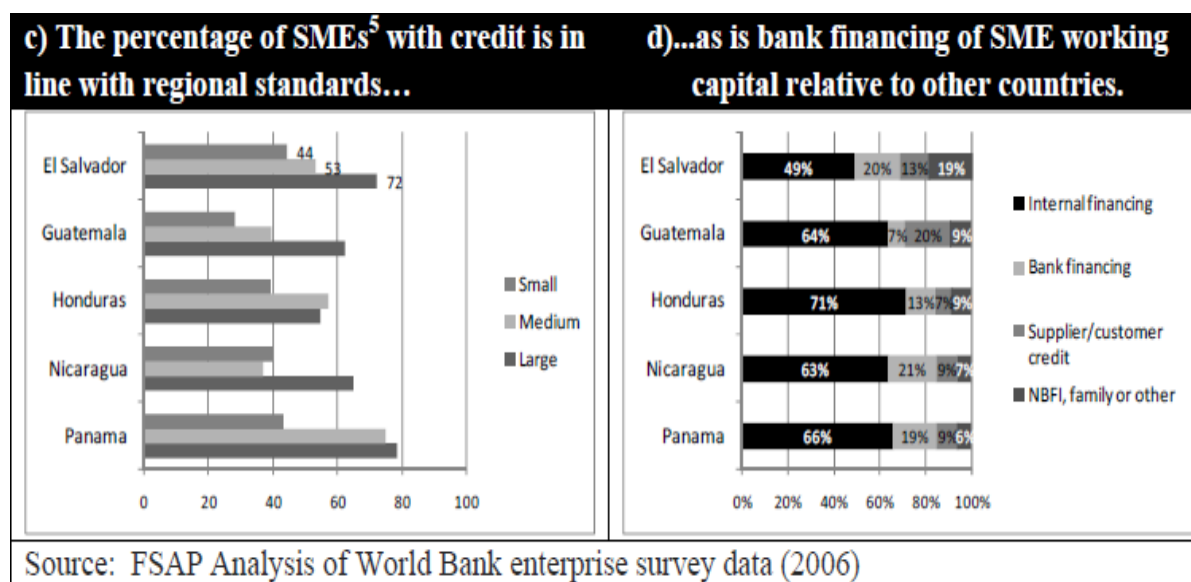
**Table 4.14: Credit extended to firms, by company size (USD millions)**

| Firm size | 2006    | 2007    | 2008    | 2009    | 2010    |
|-----------|---------|---------|---------|---------|---------|
| Large     | 3,339.2 | 3,333.6 | 2,992.7 | 2,509.1 | 2,685.7 |
| Medium    | 591.0   | 658.7   | 701.3   | 563.5   | 625.3   |
| Small     | 312.9   | 327.8   | 220.9   | 162.9   | 228.7   |
| Micro     | 124.7   | 115.3   | 226.0   | 110.5   | 134.4   |
| Total     | 4,367.8 | 4,435.3 | 4,140.9 | 3,346.1 | 3,674.1 |

Source: Superintendence of the Financial System 2010

As shown in Figure 4.15 below, the 2006 World Bank Enterprise Survey data shows that SME access to bank credit is roughly in line with regional standards, in terms of both percentage of SMEs with credit and bank financing of SME working capital.<sup>4</sup>

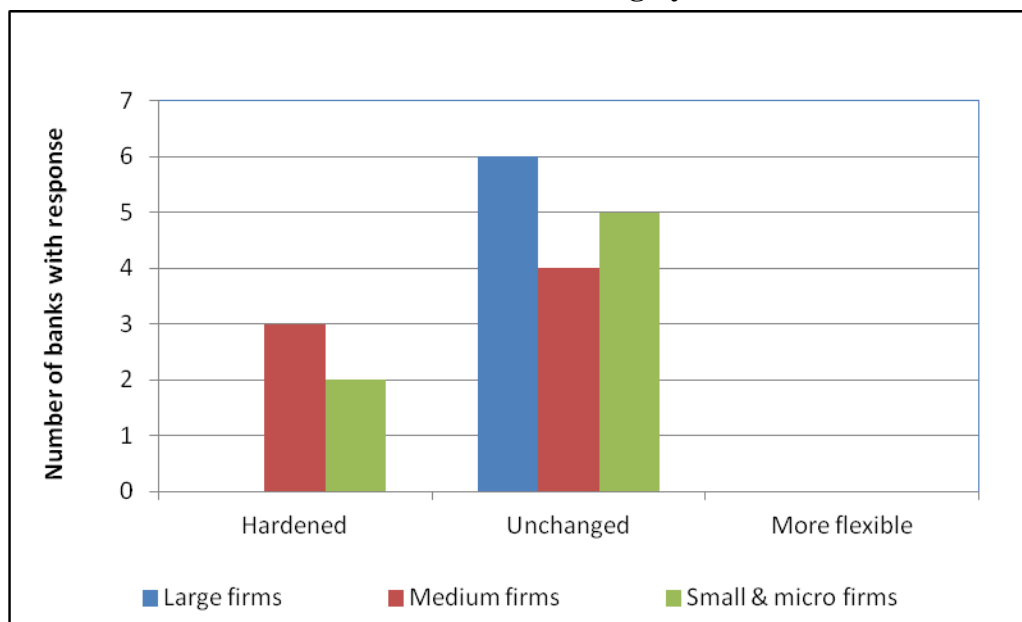
**Figure 4.15: SME Credit and Bank Financing**



Unfortunately, we do not have data for comparator countries. According to a BCR survey, the banks made it slightly more difficult for SMEs to obtain loans from 2008-2009 (See Figures 4.16 and 18.) This challenge has been driven in part by economic uncertainty.

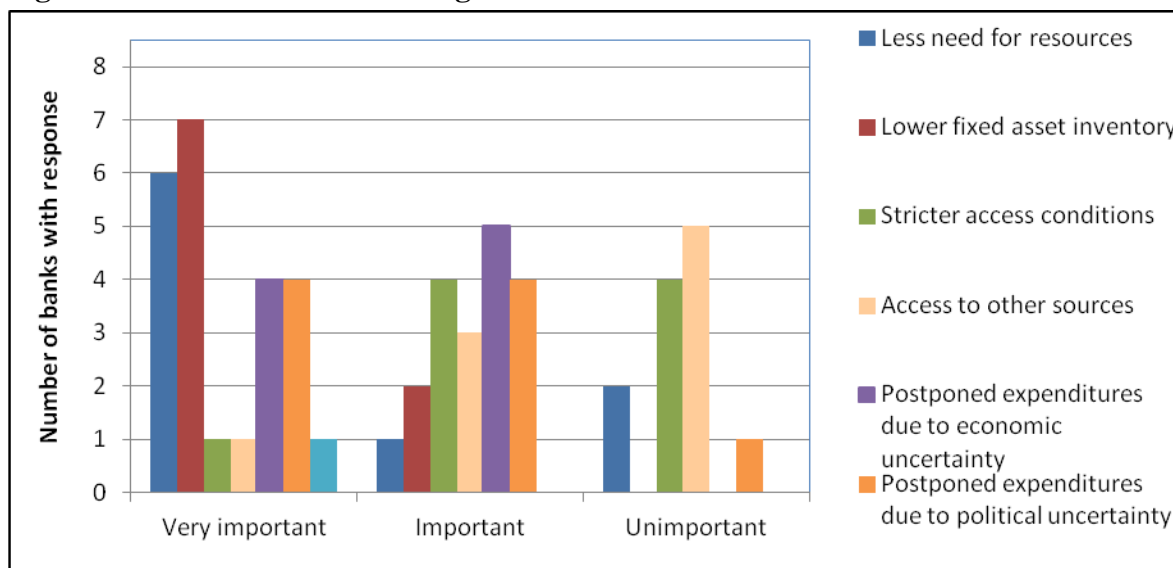
<sup>4</sup> The World Bank enterprise surveys define small firms as those with 5-20 employees, medium firms as those with 20-99 employees, and large firms as those with 100+ employees.

**Figure 4.16: Changes in Requirements for Approving Business Loan Requests during 2008 – 2009 in the Salvadoran Commercial Banking System**



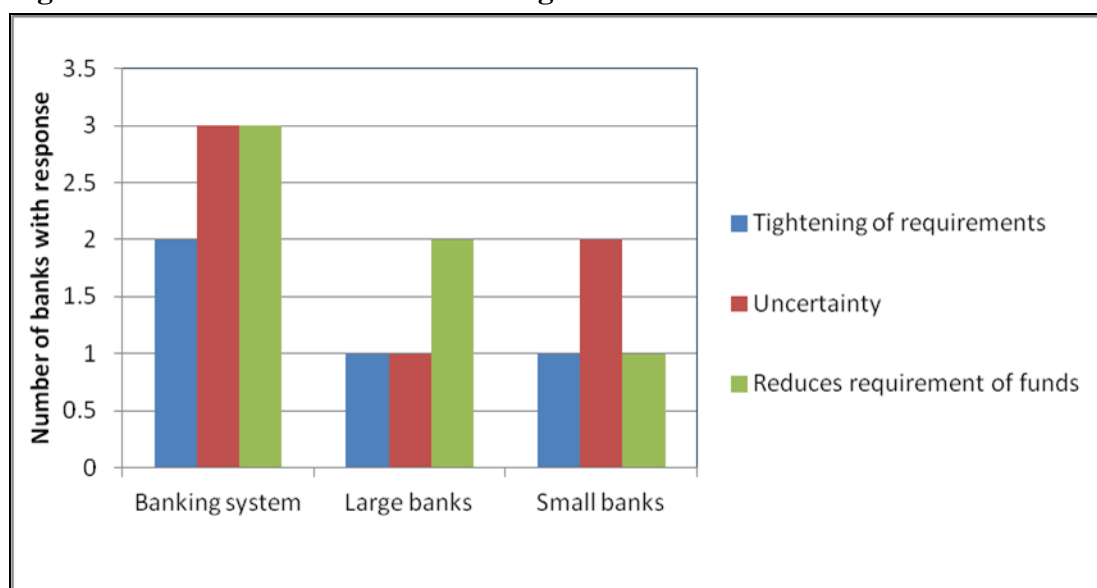
Source: Central Reserve Bank based on Superintendence of the Financial System, 2010

**Figure 4.17: Factors Contributing to the Credit Reduction**



Source: Central Reserve Bank based on Superintendence of the Financial System 2010

**Figure 4.18: Bank Factors Contributing to the Credit Reduction**

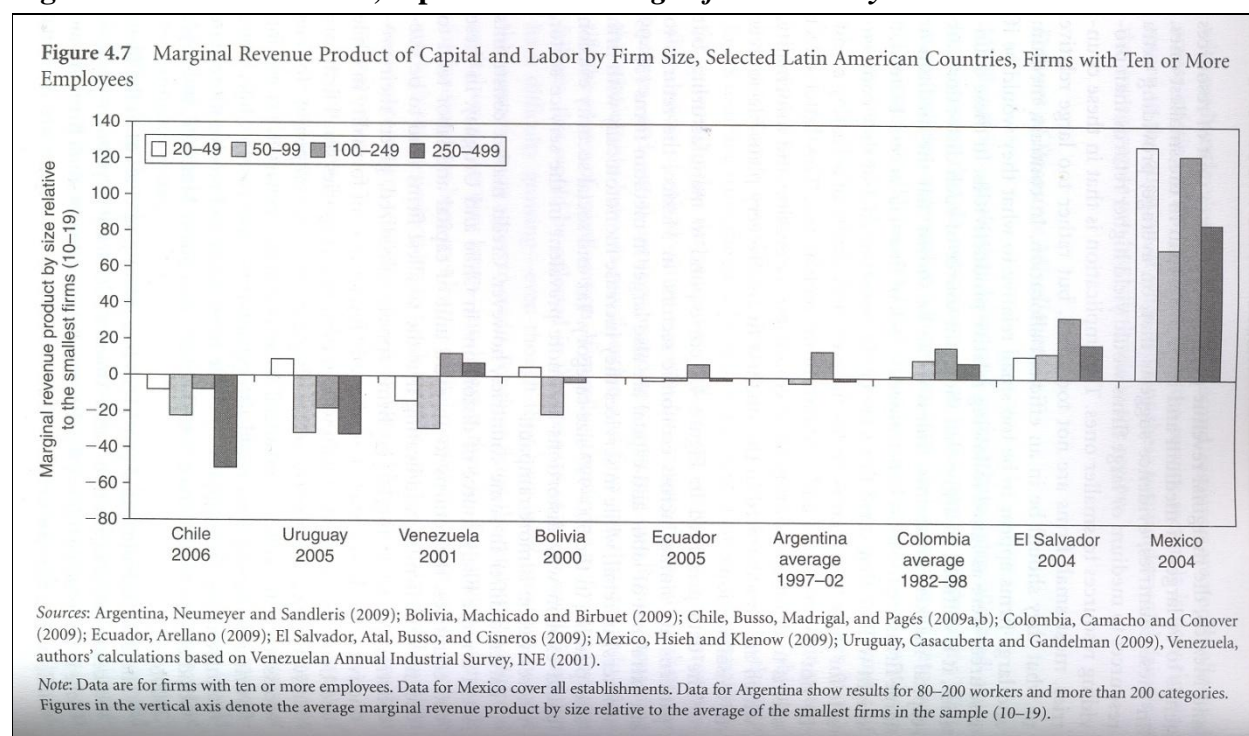


*Source: Central Reserve Bank on Superintendence of the Financial System, 2010*

These survey responses could highlight a “fan belt effect” of the 2008 credit crisis. Pritchett (2008) references a fan belt effect in which “an initial binding constraint may have affected the rest of the economy causing now other constraints to be binding.” The frozen credit markets in 2008 lead to concentrated, risk-averse banks that have consequently shifted their credit allocations away from SMEs in the face of economic uncertainty. Although global credit markets may have recovered, the long-term effects of the crises linger with SME development in El Salvador.

Looking then at the relationship between SME investment and output, this test should show that overall investment or growth increases as access to credit for SMEs improves. The IDB has found that El Salvador lacks medium and high-productivity firms compared to their regional peers (Pages 2010, 77), and that marginal productivity (relative to micro firms) is especially high among medium-sized manufacturing firms.

**Figure 4.19: MPK & MPL, reproduced from *Age of Productivity***



We can also look at sectors in the Salvadoran economy that have stronger backward and forward linkages than the average, weighted by final demand from the 2006 Input-Output tables. These sectors are compared to the value added of SMEs in total. The sectors that have longer production chains are basic chemical and metal products, and transport, storage and communications. These include new industries key to the Salvadoran economy, such as machinery, equipment and supplies for the maquila industry.

**Table 4.20: Sensitivity indices of dispersion (SD) and power dispersion (PD) weighted by final demand, 1990 and 2006**

| Sector   | 1990  |       |           | 2006  |       |           |        |
|--|-------|-------|-----------|-------|-------|-----------|--------|
|  | SD    | PD    | Class     | SD    | PD    | Class     | VBP/OT |
| 10. Mining products                                | 1.04  | 0.30  | Strategic | 0.60  | 0.20  | Enclave   | 0.21   |
| 14. Milling and baked products                     | 0.92  | 0.99  | Enclave   | 0.93  | 0.93  | Enclave   | 0.75   |
| 16. Other processed food products                  | 1.29  | 0.85  | Strategic | 1.51  | 0.99  | Strategic | 0.55   |
| 19. Textiles and apparel                           | 1.07  | 0.81  | Strategic | 1.11  | 0.85  | Strategic | 0.38   |
| 24. Printing and related industries                | 0.72  | 0.43  | Enclave   | 1.08  | 0.56  | Strategic | 0.47   |
| 25. Basic and processed chemicals                  | 3.41  | 1.25  | Key       | 3.52  | 1.46  | Key       | 0.32   |
| 26. Petroleum refining                             | 4.54  | 0.77  | Strategic | 2.83  | 0.51  | Strategic | 0.43   |
| 27. Rubber and plastic products                    | 0.69  | 0.53  | Enclave   | 0.98  | 0.67  | Enclave   | 0.27   |
| 29. Basic metal and processed products             | 1.05  | 1.19  | Key       | 1.40  | 1.36  | Key       | 0.36   |
| 30. Machinery and equipment                        | 0.71  | 0.62  | Enclave   | 1.85  | 1.19  | Key       | 0.11   |
| 31. Transport equipment and miscellaneous products | 1.16  | 0.60  | Strategic | 1.67  | 0.84  | Strategic | 0.15   |
| 34. Construction                                   | 0.81  | 0.99  | Enclave   | 0.85  | 1.04  | Driving   | 0.99   |
| 35. Trade  | 0.01  | 20.02 | Driving   | 0.02  | 17.81 | Driving   | 0.54   |
| 36. Restaurants and hotels                         | 0.60  | 0.72  | Enclave   | 0.68  | 0.76  | Enclave   | 0.84   |
| 37. Transport and storage                          | 11.63 | 1.11  | Key       | 11.63 | 1.27  | Key       | 0.83   |
| 38. Communications                                 | 0.51  | 0.32  | Enclave   | 1.22  | 0.82  | Strategic | 0.94   |
| 40. Real estate and business services              | 3.36  | 0.50  | Strategic | 2.17  | 0.49  | Strategic | 0.91   |
| 41. Housing rental                                 | 0.99  | 1.02  | Driving   | 0.66  | 0.73  | Enclave   | 1.00   |
| 42. Community, social and personal services        | 2.01  | 0.76  | Strategic | 1.64  | 0.70  | Strategic | 0.88   |
| 44. Government services                            | 0.85  | 1.03  | Driving   | 0.61  | 0.95  | Enclave   | 1.00   |
| 45. Maquila industrial services                    | 0.03  | 0.11  | Enclave   | 1.13  | 1.17  | Key       | 0.23   |

Source: Oscar Cabrera and Morales de Hada (2005 and 2006). MIP 2006 updated by Cabrera (2010)

*\*If  $PD < 1$  and  $SD > 1$ , the sector is defined as strategic: strong forward linkages  
If  $PD > 1$  and  $SD < 1$ , the sector is defined as driving: strong backward linkages  
If  $PD > 1$  and  $SD > 1$ , the sector is defined as key: strong linkages in both directions*

*Tables 1990 and 2006, final*

According to the 2005 Economic Census, SMEs represented 59 percent of value added in chemical industries, 88 percent of value added in machinery and equipment, and 36 percent of value added in manufacturing of basic and other metals. SMEs contributed 46 percent of value added in wholesale and retail trade.

**Table 4.21: Value Added and Employment by 2005 Economic Census**

| Branches of economic activity  | Classification by size of enterprise | Value Added, USD | Employment (Number) |
|--|--------------------------------------|------------------|---------------------|
| Manufacturing of Chemicals and Chemical Products                     | SMEs                                 | \$2,247,533      | 82                  |
|  | total                                | \$3,836,251      | 221                 |
| Manufacturing of basic and other metals                              | SMEs                                 | \$15,877,786     | 1,814               |
|  | total                                | \$46,538,516     | 4,441               |
| Manufacturing of machinery and equipment                             | SMEs                                 | \$854,694        | 84                  |
|  | total                                | \$969,217        | 122                 |
| Transport  | SMEs                                 | \$396,821,667    | 14,248              |
|  | total                                | \$1,094,667,322  | 30,819              |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | SMEs                                 | \$1,138,045,120  | 78,623              |
|  | total                                | \$2,453,392,602  | 258,137             |

Simulations with the Input-Output table show that an increase of 5 percent in investment in one of the key sectors produces multiplier effects in other economic sectors on the order of 0.4 percent to 1.4 percent of GDP. For example, a 5 percent increase in investment in the trade sector produces a 0.7 percent increase in GDP over the next year. 5 percent increase in investment in the maquila industry produces a 1.4 percent increase in GDP. The same increase in investment in chemical industries and machinery and equipment would increase GDP produced in other industries by 0.5 percent.

***Agents in the Economy should be attempting to overcome or bypass the constraint***

Firms could get around credit constraints by relying on retained earnings, or remittance income. Recent studies on remittances show that the vast majority goes towards funding consumption rather than investment. Firms could also simply apply for bank credit. Salvadoran firms apply for credit at about the same rate as all of Central America, although they had slightly lower probability of having loan applications accepted (83 percent vs. 87 percent) (World Bank Enterprise Survey 2006, Table 4.22). Nevertheless, most of those not applying did not need



credit and there was actually a lower percentage, compared to the rest of Central America, who did not apply because of high interest (Table 4.23).

**Table 4.22: Did Firm apply for credit in the past fiscal year? (2006)**

| <b>Response</b> | <b>El Salvador</b> | <b>Central America</b> |
|-----------------|--------------------|------------------------|
| Yes             | 43.29%             | 42.88%                 |
| No              | 56.13%             | 56.51%                 |

**Table 4.23: Main Reasons for not applying for Loans or Lines of Credit (2006)**

| <b>Reason</b>                                  | <b>El Salvador<br/>Percentage</b> | <b>Central America<br/>Percentage</b> |
|--|-----------------------------------|---------------------------------------|
| There was no need for a loan                   | 70.69                             | 71.60                                 |
| Difficulties with processing                   | 5.40                              | 4.93                                  |
| High interest rates                            | 6.43                              | 11.01                                 |
| Strict collateral requirements                 | 4.37                              | 3.48                                  |
| Inadequate amounts and ending dates of loans   | 0.26                              | 0.44                                  |
| Believed that credit was not going to approved | 1.03                              | 1.08                                  |
| Other reasons                                  | 11.83                             | 7.40                                  |
| Total  | 100                               | 100                                   |

Table 4.24 shows that 71 percent of entrepreneurs who did not apply for credit said they "there was no need" for one.

**Table 4.24: Sales volume by credit decisions**

| <b>Survey responses</b>                            | <b>Number of firms</b> | <b>Mean Total Sales in Previous Year</b> | <b>Std. Dev. Of Total Sales</b> |
|--|------------------------|--|---------------------------------|
| Applied for credit                                 | 329                    | 3,593,617                                | 1.05e+07                        |
| Did not apply for credit                           | 253                    | 3,007,201                                | 1.19e+07                        |
| Did not apply for credit because there was no need | 126                    | 3,205,216                                | 1.18e+07                        |

Also, there appears to be no clear difference between the sales revenue of firms who sought bank credit and firms who did not. Of course, this data is from successfully established firms, not the ones who are just starting up and trying to grow to a viable size, typically small firms. The only information available on start-up and informal firms is anecdotal. Current commerce, tax and AML regulations require financial statements and proof of tax compliance for loans of all sizes,

which constrain access more heavily for informal and smaller firms (assuming some fixed costs for registration, bookkeeping and tax compliance regardless of firm size) (International Monetary Fund and The World Bank 2010). Industry experts widely report that these informal firms and SMEs then turn to consumer credit to fund their business activities, as documentation requirements are lower and the large international banks have focused on consumer and mortgage credit as a business strategy in recent years.

**Agents less intensive in that constraint should be more likely to survive and thrive, and vice versa**

In order to conclude that SME credit is a binding constraint, this test should show that capital-intensive SMEs are faring worse than their relatively labor-intensive counterparts in the economy. We do not have specific data on capital-intensive SMEs, but taking construction and mining sectors as a loose proxy for capital-intensive firms overall, we see that their share of real GDP fell slightly in 2000-2009, but stayed relatively stable during the credit crunch of 2008-2009.

**Table 4.25: Gross Domestic Products by Sectors (as percent of real GDP)**

| Year | Agriculture,<br>Livestock,<br>Forestry &<br>Fishing<br>(%) | Mining<br>(%) | Manufacturing<br>(%) | Electricity,<br>Gas &<br>Water<br>(%) | Construction<br>(%) | Services<br>(%) |
|------|--|---------------|----------------------|---------------------------------------|---------------------|-----------------|
| 2000 | 12.3   | 0.4           | 23.0                 | 0.6                                   | 3.6                 | 60.1            |
| 2001 | 11.8   | 0.4           | 23.6                 | 0.6                                   | 3.9                 | 59.8            |
| 2002 | 11.5   | 0.4           | 23.7                 | 0.7                                   | 4.0                 | 59.7            |
| 2003 | 11.4   | 0.5           | 23.7                 | 0.7                                   | 4.1                 | 59.8            |
| 2004 | 11.5   | 0.4           | 23.5                 | 0.7                                   | 3.6                 | 60.4            |
| 2005 | 11.7   | 0.4           | 23.1                 | 0.7                                   | 3.6                 | 60.6            |
| 2006 | 11.8   | 0.4           | 22.8                 | 0.7                                   | 3.7                 | 60.6            |
| 2007 | 12.3   | 0.4           | 22.6                 | 0.7                                   | 3.4                 | 60.6            |
| 2008 | 12.9   | 0.3           | 22.7                 | 0.7                                   | 3.2                 | 60.3            |
| 2009 | 13.1   | 0.3           | 22.7                 | 0.7                                   | 3.3                 | 60.0            |

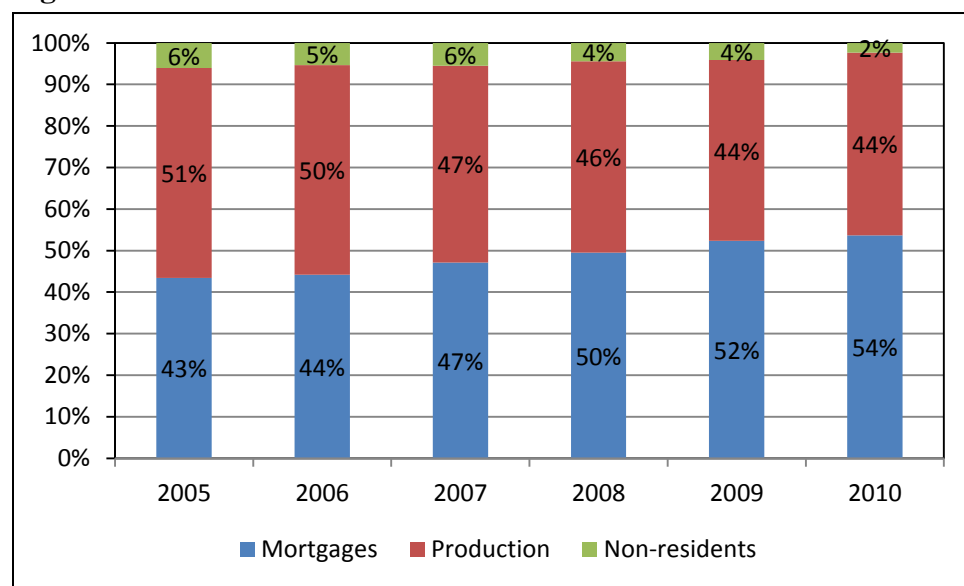
*Source : Reserve Central Bank of El Salvador*

Test 1 is inconclusive without interest rate information, Test 2 gives evidence that SME credit could be a binding constraint to overall growth, and Tests 3 and 4 do not support the binding constraint hypothesis. In sum, the evidence we have fails to reject the null hypothesis that SME credit is not a binding constraint. Nonetheless, it is clear that there are significant access to credit issues that pose significant limitations on the SMEs themselves, as well as their employees.

What is the ultimate reason that lending to small businesses is limited? This could be credit risk remaining from the financial crisis as explained earlier, and diseconomies of scale, including

regulatory requirements for documentation and possibly transaction costs. A second possible reason is low competition: the highest reported return on assets (ROA) among micro and SME lenders in 2009 was 10.2 percent. We do not have comparator ROAs for this credit segment. Anecdotally, we know that increased commercial banking concentration has spurred consumer lending and introduced foreign banks who have different risk appetites for SME lending than their Salvadoran predecessors. As a result of the banking consolidation and acquisition that occurred from 2005 until September 2008, all commercial banks in El Salvador became foreign-owned. The business strategies of these new banks (e.g. HSBC and Citibank) involved global credit risk policies or financial institutions that specialize in credits to households. For example, HSBC and Citibank's offerings of mortgage and consumer credit have shifted credit towards these uses, rather than for productive investment. Credit afforded to households has grown from 43 percent of the total portfolio in 2005 to 54 percent in 2010 (See Figure 4.26). For the reasons discussed above, consumer loans are sometimes used by micro and SMEs for production, although these can only fund short-term working capital-type needs.

**Figure 4.26: Sectoral Distribution of the Credit**



Source: SSF 2010

For the sake of completeness, we will examine below the rest of the finance node for the whole Salvadoran economy, i.e. firms of all sizes.

### C. International Financing

Finance can be accessed domestically or internationally. The first step is to identify whether access to foreign borrowing is restricted. El Salvador's sovereign risk rating has recently been downgraded by three major credit agencies. In January 2009, Moody's downgraded El Salvador's government bond rating to "Ba1" from "Baa2" with a stable outlook, but by March

2011 it was downgraded again, to “Ba2”, or “questionable credit quality.” Moody’s judges “Ba” issues “to have speculative elements and subject to substantial credit risk.” In January 2011, Standard and Poor’s and Fitch had both downgraded El Salvador’s government bonds to “BB-” or “speculative grade,” such that the issues are “less vulnerable in the near term but face major ongoing uncertainties to adverse business, financial and economic conditions.” Based on the following table of comparators, El Salvador’s rating ranked roughly in the middle of Latin American countries in 2010, with a decline in 2011 due to the recent downgrade.

**Table 4.27: Moody’s Sovereign Ratings for Comparative Countries 2010 - 2011**

| Country            | January 2010 Rating | Present (May 2011) |
|--------------------|---------------------|--------------------|
| Chile              | A1                  | Aa3                |
| México             | Baa1                | Baa1               |
| Brazil             | Baa3                | Baa3               |
| Costa Rica         | Ba1                 | Baa3               |
| Panamá             | Ba1                 | Baa3               |
| Peru               | Baa3                | Baa3               |
| Colombia           | Ba1                 | Ba1                |
| Guatemala          | Ba2                 | Ba1                |
| Uruguay            | Ba3                 | Ba1                |
| El Salvador        | Ba1                 | Ba2                |
| Dominican Republic | B1                  | B1                 |
| Paraguay           | B3                  | B1                 |
| Honduras           | B2                  | B2                 |
| Venezuela          | B2                  | B2                 |
| Argentina          | B3                  | B3                 |
| Nicaragua          | Caa1                | B3                 |
| Ecuador            | Caa3                | Caa2               |

Figure 4.28 **Error! Reference source not found.** shows that there has been some volatility in El Salvador’s spread with U.S. Treasuries for international borrowing, but its relationship to gross investment is not statistically significant. Also, the recent Eurobond rollover was oversubscribed, indicating that the authorities could have borrowed more internationally had they chose to do so.

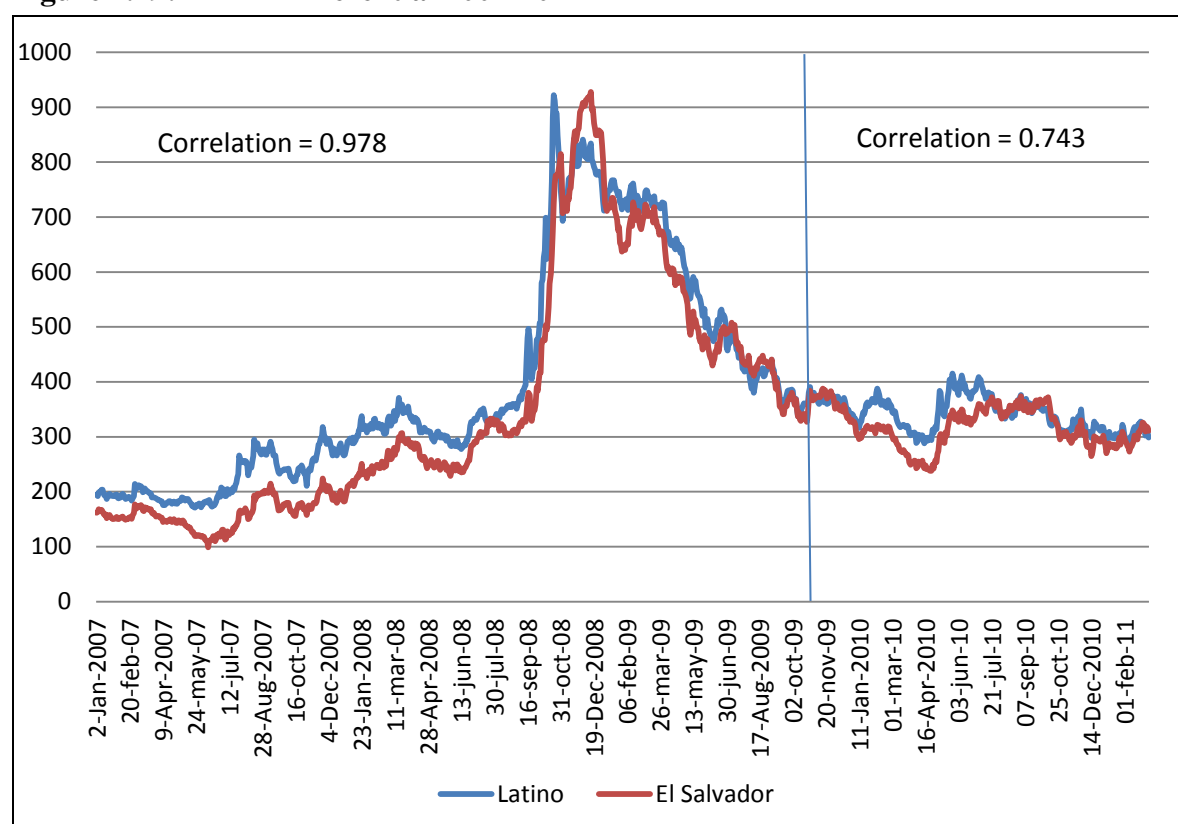
**Table 4.28: El Salvador's External Debt (Sovereign Issues)**

| Issue  | 25-<br>Jan-<br>11              | 20-<br>Nov-<br>09          | 13-<br>Jul-<br>06 | 19-<br>Apr-<br>06 | 1-<br>Jun-<br>05                | 14-<br>Sep-<br>04 | 25-<br>Feb-<br>03  | 17-<br>Oct-<br>02 | 23-<br>Jul-<br>02 | 3-<br>April-<br>02 | 18-<br>Jul-<br>01 | 24-<br>Jan-<br>00 | 4-<br>Aug-<br>99  |
|--|--------------------------------|----------------------------|-------------------|-------------------|---------------------------------|-------------------|--------------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|
| Amount<br>(U.S. \$<br>million)                                     | 653.5                          | 800.0                      | 225.0             | 400.0             | 375.0                           | 286.4             | 348.5              | 451.5             | 300.0             | 500.0              | 353.5             | 50.0              | 150.0             |
| Maturity   | 01-<br>Feb-<br>41              | 1-<br>Dece-<br>mber-<br>19 | 15-<br>Jun-<br>35 | 15-<br>Jun-<br>35 | 15-<br>Jun-<br>35               | 21-<br>Sep-<br>34 | 24 -<br>Jan-<br>23 | 24-<br>Jan-<br>23 | 25-<br>Jul-<br>11 | 10-<br>Apr-<br>32  | 25-<br>Jul-<br>11 | 15-<br>Jan-<br>07 | 15-<br>Aug-<br>06 |
| Term   | 30<br>Years                    | 10<br>Years                | 30<br>Years       | 30<br>Years       | 30<br>Years                     | 30<br>Years       | 20<br>Years        | 20<br>Years       | 10<br>Years       | 30<br>Years        | 10<br>Years       | 7<br>Years        | 7<br>Years        |
| Demand<br>(Million U.S.<br>\$)                                     | 1,700.<br>0                    | 3,500<br>.0                | 1,000<br>.0       | 1,071<br>.2       | 800                             | 2,649             | 1,160              | 1,625             | 1,200             | 2,500              | 1,000             | -                 | -                 |
| Grades   | Ba1/B<br>B/BB<br>-             | Ba1/<br>BB/B<br>B          | Baa3/<br>BB +     | Baa3/<br>BB +     | +<br>Baa3/<br>BB                | Baa3/<br>BB +     | Baa3/<br>BB +      | +<br>Baa3/<br>BB  | Baa3/<br>BB +     | Baa3/<br>BB +      | +<br>Baa3/<br>BB  | Baa3/<br>BB +     | Baa3/<br>BB +     |
| Spread (bp)  | 313.1                          | 403                        | 275               | 240               | 345                             | 349               | 355.5              | 361               | 300               | 265                | 350               | 355               | 500               |
| Gross Capital<br>Formation as<br>% of GDP                          |                                | 13.12                      | 16.13             | 16.13             | 15.72                           | 16.20             | 16.98              | 16.39             | 16.39             |                    | 16.67             | 16.93             | 16.43             |
| GDP per<br>capita (PPP)  |                                | 7355                       | 6862              | 6862              | 6420                            | 6013              | 5802               | 5591              | 5591              | 5591               | 5413              | 5240              | 5056              |
| Correlation<br>between<br>gross capital<br>formation<br>and spread | -0.179220877                   |                            | Cov: - 12.4382    |                   |                                 |                   |                    |                   |                   |                    |                   |                   |                   |
| Correlation<br>between<br>GDP and the<br>spread                    | -0.295501197                   |                            |                   |                   |                                 |                   |                    |                   |                   |                    |                   |                   |                   |
| * Reopening  | ** Option to<br>put a 10 Years |                            |                   |                   | *** Option to<br>put a 15 Years |                   |                    |                   |                   |                    |                   |                   |                   |

Source: Central Reserve Bank

Figure 4.29 below illustrates the daily spread between the Emerging Markets Bond Index (EMBI) for Latin America and U.S. Treasuries, and El Salvador's spread, from January 2007 through March 2011. The spreads are strongly correlated at 0.978, although correlation has dropped recently. Since the first drop in November 2009, the correlation has been only 0.743. Volatility in the Latin America and El Salvador spreads have decreased substantially, with standard deviation for both dropping from about 200 basis points in 2007-2009 to about 30 basis points in 2009-2011 (2011 year to date).

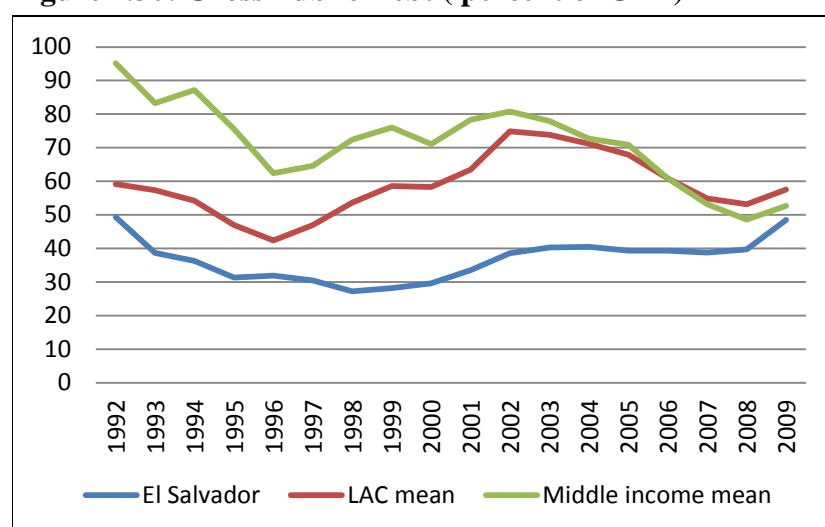
**Figure 4.29: EMBI Differential 2007-2011**



The rating of the country has deteriorated due to several factors, with the growing level of public debt playing an important role. The drop in ratings from investment grade to speculative grade is relevant in terms of the conditions and access to international financing markets in the short term. In fact, the loss of private leverage that occurred at the end of 2008 and beginning of 2009 reflects, in part, the hardening of the financial markets, which moved their resources to markets considered safer. This restricted access to certain type of investors, which shows the volatility of these resources.

Part of the reason for El Salvador's relative ability to borrow in international capital markets is its fiscal balance. Figure 4.30 compares gross public debt as a percent of GDP for El Salvador relative to the average ratios for Latin American and middle-income countries. El Salvador has historically been below the average for both, with the IMF projecting movement above 50 percent only after 2010 (IMF 2010). Based on the optimal debt literature, the IMF (2010) suggests a target debt-to-GDP ratio of 35 percent in El Salvador, including sufficient space to absorb contingent liabilities. Nonetheless, as shown in Figure 4.30, El Salvador's level of gross public debt has not been statistically different from comparable countries since 2005 – it is slightly lower, but within the range of a single standard deviation.

**Figure 4.30: Gross Public Debt ( percent of GDP)**



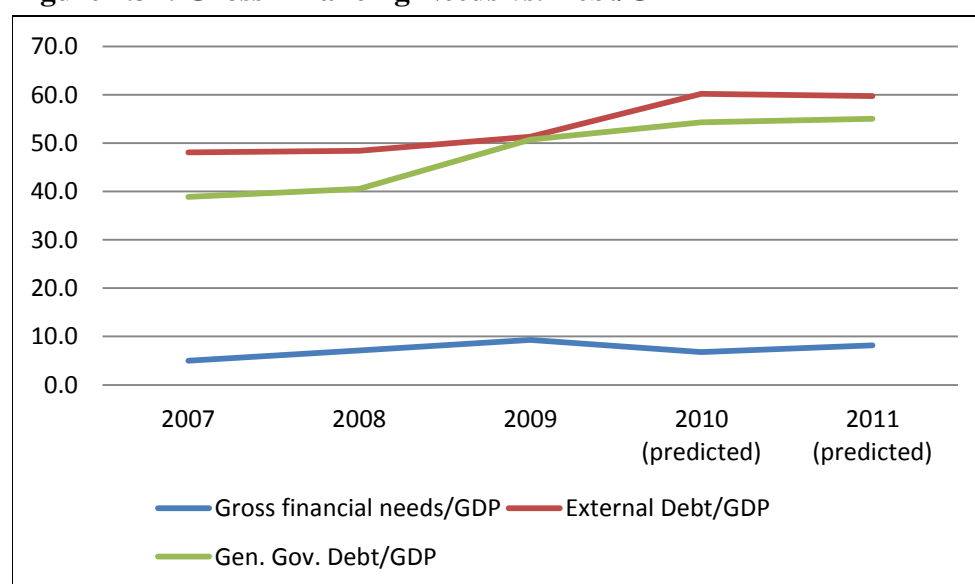
Source: World Development Indicators (2011)

**Table 4.31: Comparison Statistics of Gross Public Debt (percent of GDP)**

| El Salvador compared with mean, in terms of standard deviations: | 2005  | 2006  | 2007  | 2008  | 2009  |
|--|-------|-------|-------|-------|-------|
| Latin America and the DR   | -0.70 | -0.56 | -0.44 | -0.38 | -0.23 |
| Middle-income Countries  | -0.53 | -0.46 | -0.40 | -0.29 | -0.12 |

Source: IMF World Economic Outlook

**Figure 4.32: Gross Financing Needs vs. Debt/GDP**



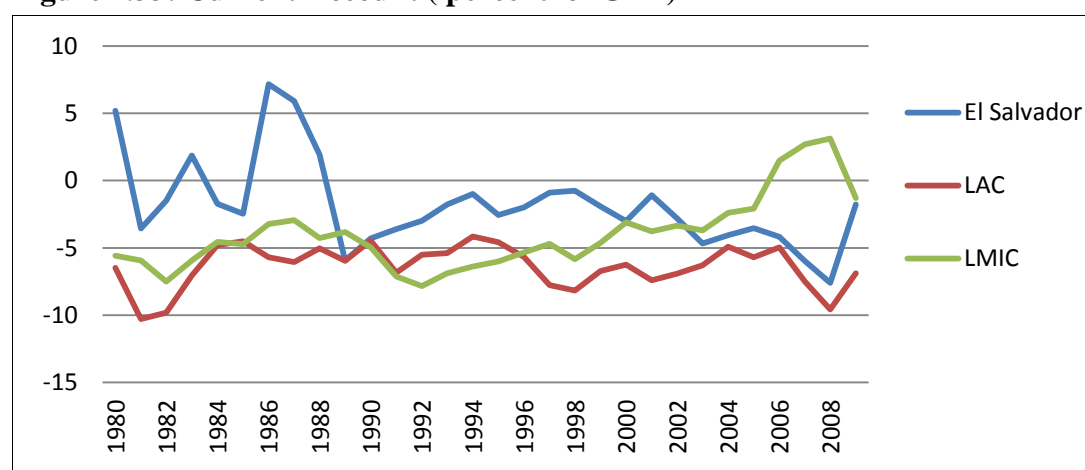
Sources: World Development Indicators (2011) and IMF Article IV Report (2010)

Although both the IMF and private ratings agencies have noted the potential for El Salvador's fiscal environment to further weaken in the near to medium term, the general prognosis seems to

be that this is not very likely. Although the country's fiscal balance could be stronger, there is no indication that this might be a binding constraint to private investment.

Similarly, the current account balance does not suggest that El Salvador may have trouble accessing foreign credit. Economies with substantial access to international financing can carry current account deficits. Figure 4.33 shows the current account balance as a percent of GDP in El Salvador and in relation to Latin American countries (LAC) and lower-middle income countries (LMIC) from 1980 through 2009. Since 2003, El Salvador has been relatively correlated with movements across LAC. Table 4.34 provides a statistical comparison that shows El Salvador is well within a single standard deviation.

**Figure 4.33: Current Account ( percent of GDP)**



Source: World Development Indicators (2011)

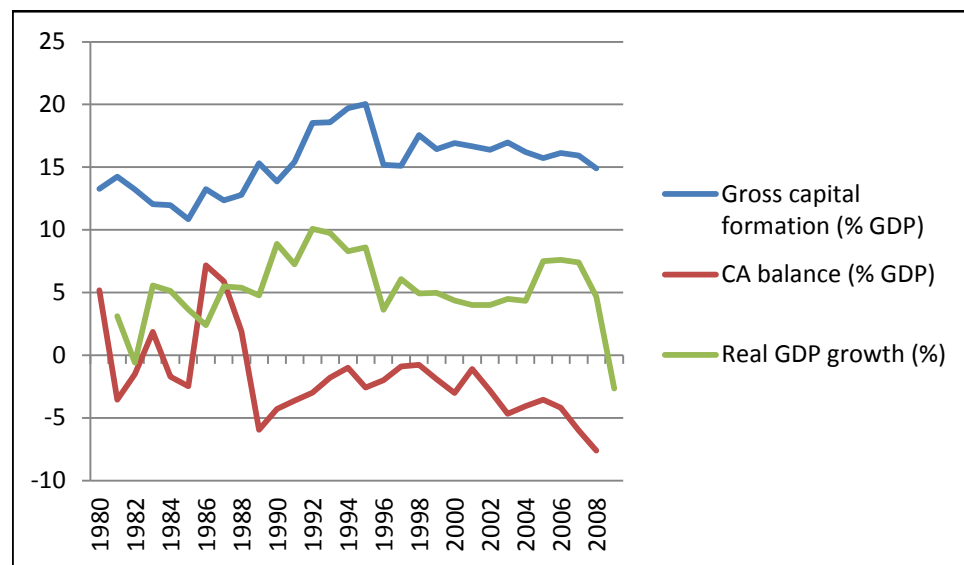
**Table 4.34: Comparison of Current Account of El Salvador with other countries**

| El Salvador in comparison means of (in terms of standard deviations): | 2005  | 2006  | 2007  | 2008  | 2009  |
|---|-------|-------|-------|-------|-------|
| Latin America and the DR  | 0.19  | 0.06  | 0.10  | 0.13  | 0.48  |
| Middle-income countries   | -0.10 | -0.22 | -0.18 | -0.17 | -0.01 |

Figure 4.35 shows some relationship between growth and investment, but no clear relationship between these two variables and the current account balance (as a percentage of GDP).



**Figure 4.35: Rate of Growth of the GDP, Formation of Capital and Current Account of El Salvador**



Source: World Development Indicators (2011)

## D. Domestic Savings

In traditional economic thought, an implied causality runs from domestic savings to growth of GDP due to reduction in the relative cost of investing, which increases the level of production. Mohan (2006) suggests that in some economies the causality is reversed: GDP growth generates a higher disposable income, which then leads to increased savings.

Following Mohan's methodology, a Granger causality test was conducted to determine the endogeneity of National Savings and GDP in El Salvador. "Granger causality" represents a statistical relationship between two correlated variables, such as savings and wealth (Granger 1969).<sup>5</sup> If data suggests that one data trend "precedes" another – say, people save more and so they get richer – then we would say that savings "Granger causes" wealth. If people happen to get wealthy and therefore save more, we would say that wealth "Granger causes" savings. It is possible for two variables to "Granger cause" each other, just as it is possible for two correlated variables to have no statistical relationship of causality.

The series used to perform the exercise from the World Database of the World Bank Development Indicators (WDI, 2011):

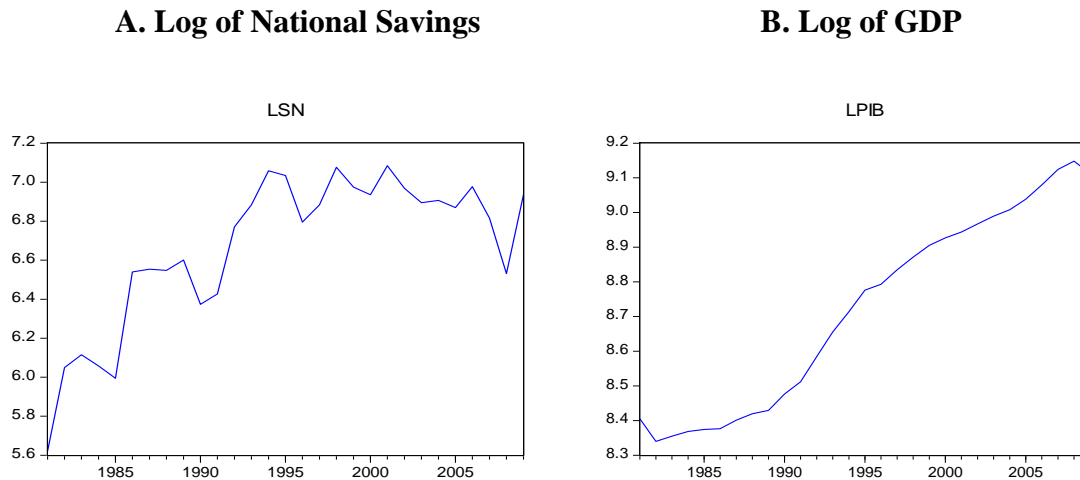
**Saving** is calculated as current savings published by the WDI<sup>6</sup> using the GDP deflator for constant 1990 prices over the period 1981-2009, in log form (LSN) (Figure 4.36).

<sup>5</sup> The test is named after its originator, Clive Granger.

<sup>6</sup> Gross National Income Available less Final Consumption Expenditure

**Gross Domestic Product (GDP)** from WDI at constant 1990 prices , also in log form (LGDP) (Figure 4.36).

**Figure 4.36: National Savings and logarithm of GDP in El Salvador (1981-2009)**



Source: Authors' calculations based on WDI 2011 online database

### The test of causation:

We performed Granger causality test provided by Eviews ("Pairwise Granger Causality Tests") for the variables in level and difference with two lags.<sup>7</sup> The first case tests the null hypothesis that national savings (LSN) "causes" national income (LGDP), and the second whether GDP "causes" savings. Figure 4.37 shows the conclusions. The results give weak evidence that National Savings does not Granger-cause GDP (in levels and differences) and strong evidence that GDP does not Granger-cause National Savings. In econometrics terms, National Savings precedes GDP.

**Figure 4.37: Granger Causality Tests**

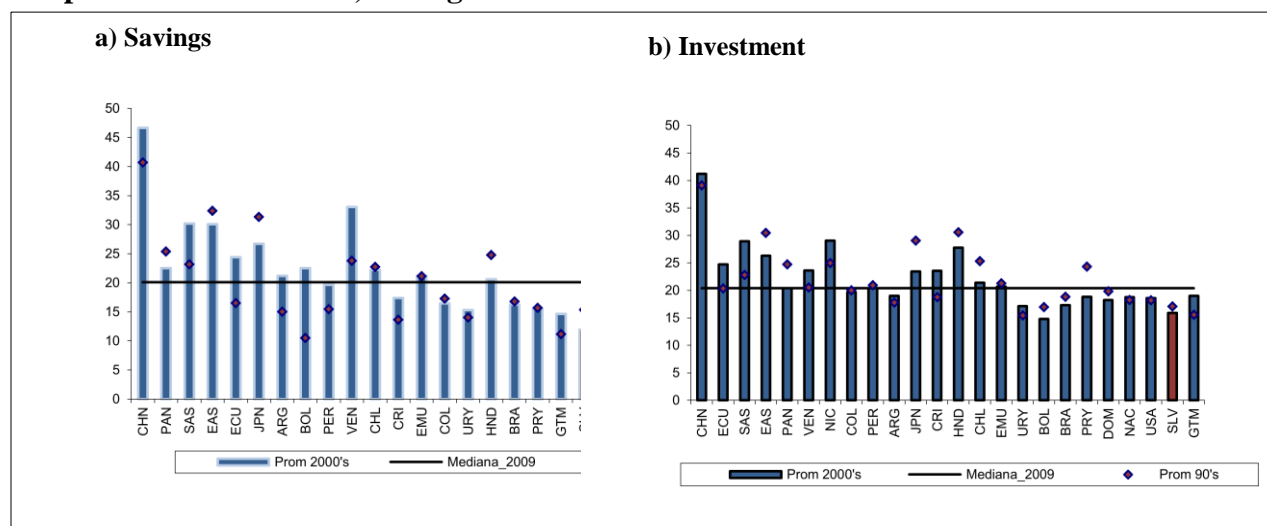
| Pairwise Granger Causality Tests |     |             |        | Pairwise Granger Causality Tests  |     |             |        |
|----------------------------------|-----|-------------|--------|-----------------------------------|-----|-------------|--------|
| Date: 04/26/11 Time: 10:11       |     |             |        | Date: 04/11/11 Time: 11:25        |     |             |        |
| Sample: 1981 2009                |     |             |        | Sample: 1981 2009                 |     |             |        |
| Lags: 2                          |     |             |        | Lags: 2                           |     |             |        |
| Null Hypothesis:                 | Obs | F-Statistic | Prob.  | Null Hypothesis:                  | Obs | F-Statistic | Prob.  |
| LSN does not Granger Cause LPIB  | 27  | 4.407       | 0.0246 | DLSN does not Granger Cause DLPIB | 26  | 3.2986      | 0.0568 |
| LPIB does not Granger Cause LSN  |     | 0.81351     | 0.4562 | DLPIB does not Granger Cause DLSN |     | 0.01036     | 0.9897 |

<sup>7</sup> Two lags were chosen, considering that two years is a prudent time for the use of savings in investment decisions that ultimately generate growth in GDP.

Note that evidence of Granger causality may arise from existence of a third “unobserved” variable that influences both the behavior of savings and GDP completely independently of each other, and therefore the implementation of policies aimed at changing the savings may have no impact on output growth. For example, a dramatic improvement of a financial system could improve overall productivity – and thus GDP – while also increasing the incentives for citizens to save.

The high correlation between savings and investment, which was identified during the 1980’s by the Feldstein-Horioka (FH) paradox, continues to be a robust finding for developed and developing economies. The comparison of the average domestic savings rates and investment during the 1990’s and 2000’s for a sample of countries shows that investment follows the movements of domestic savings and is an indication of either imperfect mobility of capital or financial restrictions<sup>8</sup> (Figure 4.38).

**Figure 4.38: Savings and Investment as a percent of the GDP in El Salvador and in a sample of other countries, averages for 1990’s and 2000’s**



Source: Online Database 2011 of World Development Indicators

Latin American and Caribbean countries have shown, since the 1990’s, the lowest rates of savings and investment in relation to the rest of the regions of the world, with the exception of Sub-Saharan Africa. Within the Latin American region, El Salvador is one of the countries which has shown the lowest ratios of domestic savings to the GDP, a situation which has been deteriorating since the mid-1990’s. Assuming the Feldstein-Horioka paradox is valid, the low rate of domestic savings implies a restriction to investment and growth of the Salvadoran economy.

<sup>8</sup>There are other elements which could explain this result, such as the existence of common factors behind the movement of savings and investment, follow-up of certain policy objectives and the differentiated short and long-term effects.

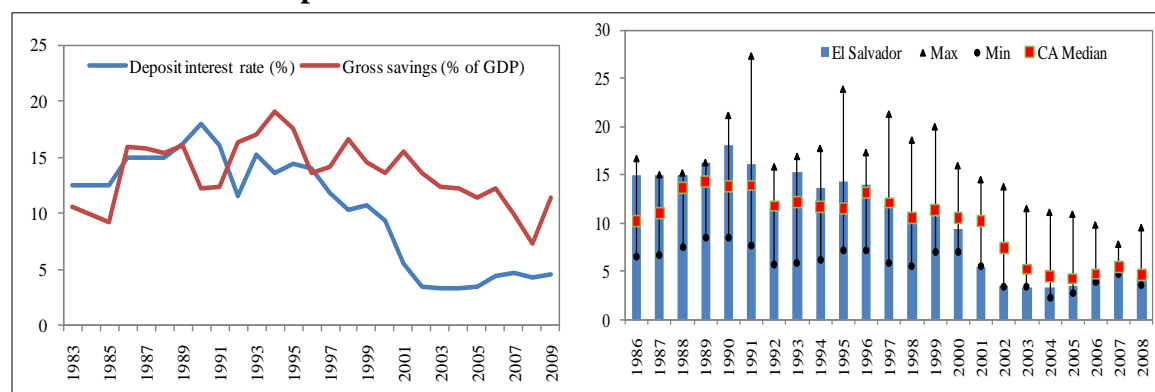
Below we try to follow up on the principles of differential diagnosis established by HKW (2008), to identify if savings is a relevant restriction for El Salvador.

### The price of savings

A binding constraint must have a very high shadow price, while the return on other assets must be depressed (Hausman 2004).

Interest rates on deposits have been decreasing since the middle of the 1990's. The reduction recorded between 1995 and 2008 was 9.4 percentage points. Salvadoran interest rates have remained at low levels in comparison to other Central American countries, staying below the regional mean since 1997. Since 2005, a slight increase can be observed, with their rates coming closer to the medium level of the region (Figure 4.39).

**Figure 4.39: Rate of Deposits and Gross Savings in El Salvador and Maximum and Minimum Rate of Deposits in El Salvador vs. Central American Mean**



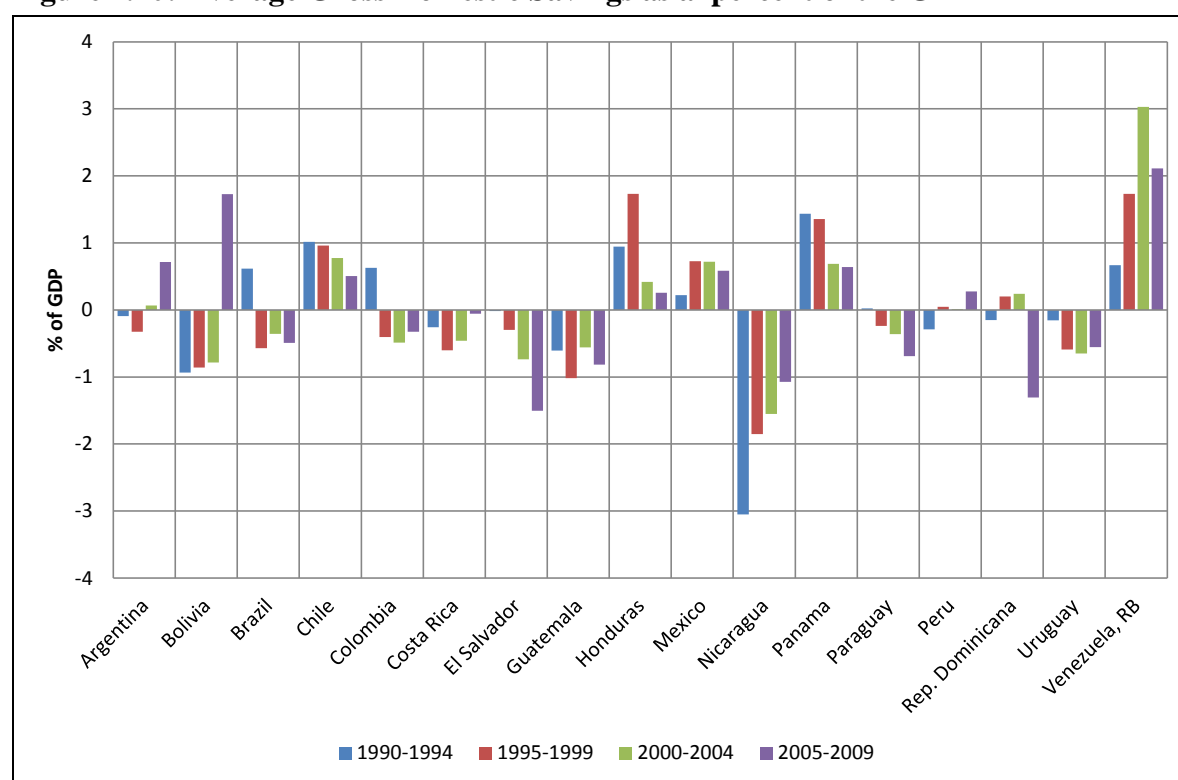
Source: World Development Indicators (2011) and Central Reserve Bank

The behavior of deposit rates would indicate that the economy does not consider savings a scarce resource and therefore is not willing to pay a higher price for it. It is important to note that savings rates have been decreasing at a rate similar to that of interest rates, experiencing a drop of 11.8 percentage points between 1995 and 2008, indicating a certain degree of reaction to its movements.

### Movements in restriction should produce significant movements in the objective

Gross domestic savings as a five-year average has deteriorated over time and with regard to the rest of Latin American countries. During the first five years of the 1990's, El Salvador showed a ratio close to the regional mean, with Nicaragua being the country with the lowest ratio; however, while Nicaragua has been reducing its gap, El Salvador has moved in the opposite direction, becoming at the end of 2009 the country with the lowest ratio of savings to GDP (see Figure 4.40).

**Figure 4.40: Average Gross Domestic Savings as a percent of the GDP**



Source: World Development Indicators (2011) and Central Reserve Bank

The reduction experienced in gross domestic savings has been partially covered by external savings, which went from 1.7 percent of GDP during the 1990's to 3.8 percent in the 2000's; despite this, domestic savings has continued to be the principal source of financing for investment<sup>9</sup>. On the other side, investments have been declining since the middle of 1990's and dependence on more volatile external savings (compared to domestic savings) has been increasing (see Table 4.41).

Assuming the FH paradox, the behavior observed in variables provides descriptive evidence of the significant effect of the movements in the restriction (savings) over the objective (investment). Savings impacts growth indirectly through movements in investments.

<sup>9</sup>The principal source of financing of the Salvadoran private sector is local banking credit, which in turn is funded mostly through local deposits.

**Table 4.41: Domestic, External Savings and Investments**

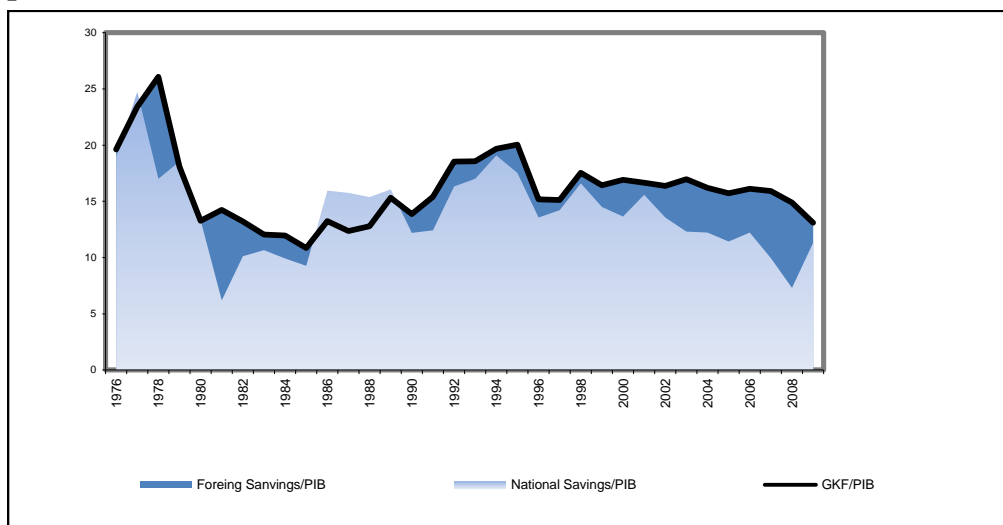
| Period           | Statistics               | Gross savings | Foreign savings | Gross capital formation |
|------------------|--------------------------|---------------|-----------------|-------------------------|
| <b>1990-1994</b> | Median                   | 15.41         | 1.91            | 17.21                   |
|                  | Coefficient of variation | 19.48         | 66.76           | 14.30                   |
| <b>1995-1999</b> | Median                   | 15.28         | 1.59            | 16.87                   |
|                  | Coefficient of variation | 11.09         | 51.40           | 12.10                   |
| <b>2000-2004</b> | Median                   | 13.47         | 3.17            | 16.63                   |
|                  | Coefficient of variation | 10.09         | 42.78           | 2.03                    |
| <b>2005-2009</b> | Median                   | 10.45         | 4.34            | 15.16                   |
|                  | Coefficient of variation | 18.59         | 49.65           | 8.13                    |

Source: Online Database World Development Indicators 2011

### The agents try to solve the constraint

Nonetheless, as mentioned in the previous section, external savings have partially compensated for the reduction in internal savings. External savings in terms of gross formation of fixed capital went from approximately 11 percent during the 1990's to around 24 percent in the 2000's (see Figure 4.42).

**Figure 4.42: External Savings, National Savings and Gross Formation of Capital as a percent of GDP in El Salvador**



Source: Online Database of World Development Indicators 2011

The balance of gross external debt grew during the 2000's; as of 2010, the ratio of debt to GDP was 54 percent. Private external debt has shown signs of deceleration since the end of 2008, after growing at significant rates during the two previous years in which the economy expanded and agents tried to resolve their financial restrictions (under savings and deficient intermediation of

resources) through direct external acquisition of debt. Access to this type of financing is, however, limited to a certain type of agents in the economy, therefore internal financial restrictions are the most relevant to certain segment of companies.

The balance of private external debt represented 22 percent of GDP for 2010, while public external debt, which has steadily grown, constituted 32 percent of GDP.

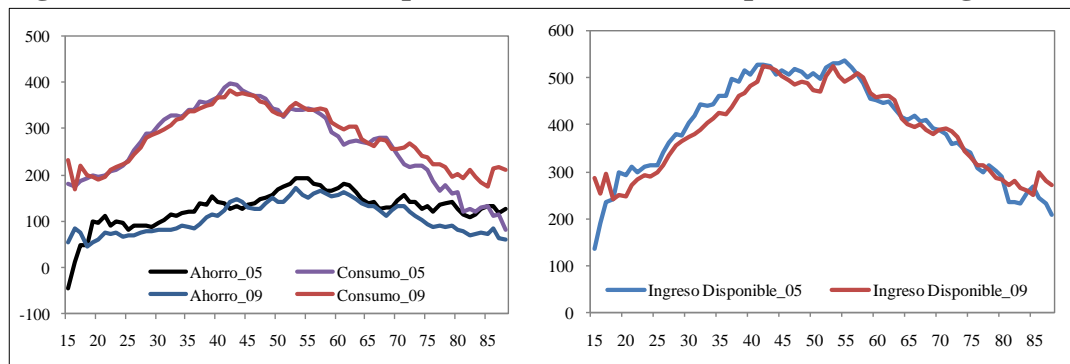
### Contrasting the life cycle hypothesis

In order to establish the importance of some variables in the behavior of national savings, we attempted to verify empirically the validity of the life cycle hypothesis for the case of El Salvador. We perform the exercise using two alternative approaches, the first to follow the patterns of income, consumption and savings of individuals throughout their lives, through disaggregated data from Multipurpose Household Surveys (EHPM). The second methodology involves the construction of an econometric model based on the series aggregate savings rate, change in disposable income and other variables proxy the same, the rate of economic dependence (non-working population as a proportion of working population), among others to determine their impact on the saving rate.

### Evidence from the information in the Household Surveys for Multiple Purposes

A fundamental element of domestic savings is family-level savings. The EHPM can construct a curve of income, consumption and household savings in terms of age of household head, which can be considered as an individual representative of the population. The information derived from surveys in 2005 and 2009, indicates that individuals have little capacity to save or even dissave in the early years of the life cycle and increase their savings gradually until reaching an average age of 53 years (peak income), from which point their savings fall off.<sup>10</sup>

**Figure 4.43: El Salvador, Disposable Income, Consumption and Savings**



Source: Authors calculations based on Household Surveys for Multiple Purposes (EHPM) 2005 and 2009.

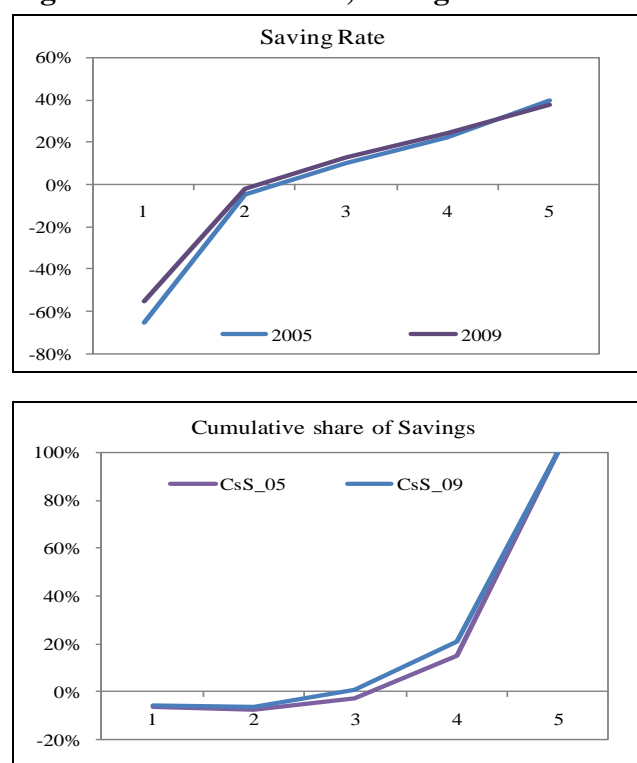
<sup>10</sup> The figures were deflated by the Consumer Price Index (CPI, base 2009).

Behavior patterns derived from household surveys show that individuals do not smooth their consumption inter-temporally, i.e. there is no stable consumption curve over time and the life cycle. Rather, it moves in line with disposable income<sup>11</sup>, indicating liquidity constraints.

The constant comparison in terms of income levels, consumption and savings from 2005 and 2009 indicates that on average there have been significant improvements in income levels, and patterns of consumption and saving have remained virtually unchanged in the five years studied.

Regarding the savings rate by income decile, the EHPM information indicates that it is only possible to obtain a positive savings ratio to the fourth income decile, and from decile six it is possible to generate a positive cumulative savings. The saving rate increases with income levels, as one would expect, and savings rates exceed 30.0 percent in the last two deciles of the distribution.

**Figure 4.44: El Salvador, savings rate and accumulated savings ratio quintiles**



*Source: Author's calculations based on Household Survey 2005 and 2009 Multi-Purpose*

### Evidence from aggregate data

The simplest way to represent dynamic relationships among multiple time series is through the construction of vector autoregressive models (VAR). In order to examine the impact of variables such as changes in income, the economic dependency ratio and wealth in the national savings rate, we built a multivariate VAR model, which considers the stationarity of the series.

<sup>11</sup> The volatility of the series is similar.



The series used to estimate the model is from the World Bank Development Indicators (WDI, 2011). The savings rate is gross national income less total consumption plus net transfers, calculated as a percentage of GDP. The economic dependency ratio<sup>12</sup> is the ratio of dependents (persons under 15 or over 64) with respect to the working-age population (people between 15 and 64). Wealth is proxied by the ratio of M2 to GDP, and the annual change in disposable income was calculated from the number of Gross National Income Available. The model was estimated with two lags, according to the Akaike criteria (AIC) and Schwarz (SC) and exceeded the contrasts of normality, autocorrelation and heteroskedasticity (see Technical Annex 2).

The results indicate that changes in disposable income help to explain the variance in savings. The reaction of saving to a shock of one standard deviation of the change in disposable income is positive and vanishes over a horizon of 3 years. The main impact is in the first year (see Technical Annex 3). Impulse response functions for the income proxy variables: terms of trade, remittances and variation in per capita also generated a positive impact on savings, to be consistent with the expected results. The reaction of saving to changes in the economic dependency ratio were contrary to what theory suggests, and while the dependency ratio has been declining, the saving rate also fell. This result is evidence against the life-cycle hypothesis in the case of El Salvador.

The results from this model should be taken with caution as the available sample size is relatively small for these estimates.

Low savings rates are not a binding constraint to economic growth since prices (interest rate of deposits) are one of the lowest in Latin America, and the economy has had access to external financing, as shown in the previous section.

## **E. Financial Intermediation**

### **a. Cost of Financing**

In El Salvador, despite the fact that interest rates for bank loans have been under the Latin American mean, there is strong evidence that the costs of financing (interest rates plus commissions) have increased because bank commissions have risen above the Central American mean, as have levels of collateral requirement, especially for smaller firms.

The prices for the different financial products have two components: the rate of interest and fees. The relative importance of both components varies according to the type of user and credit ranking. A more precise way to get closer to the cost of financing in any economy is by estimating the implicit rates of active and passive intermediation operations of the financial

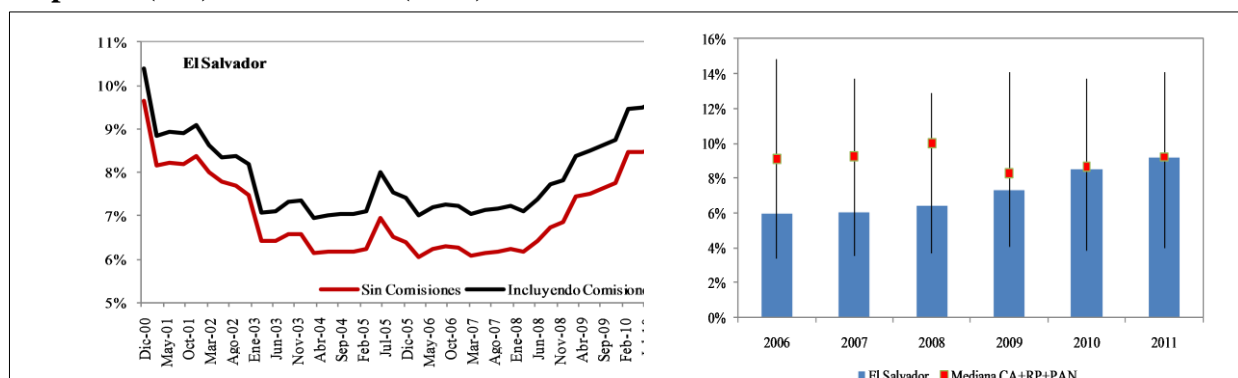
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<sup>12</sup> To preserve the order of integration within the model includes the change in the dependency ratio, because the ADF test did not reject the presence of a unit root in the ratio, which according to this test is a Series I (1).

institutions and their corresponding spread-rates that include commissions/fees plus the interest rate.

Between 2001 and 2005, intermediation spreads fell in El Salvador as a result of an accelerated decrease of the passive rates. The active rates, although in lesser proportion, accompanied the reduction process until 2003, at which point they remained relatively stable and later began to increase; this remained the same until 2005. The behavior of the active rates since the end of 2007 is reflected directly in the upward trend of the implicit spread (see Figure 4.45).

**Figure 4.45: Intermediation Spread: El Salvador, Central America (CA), Dominican Republic (DR) and Panama (PAN)**



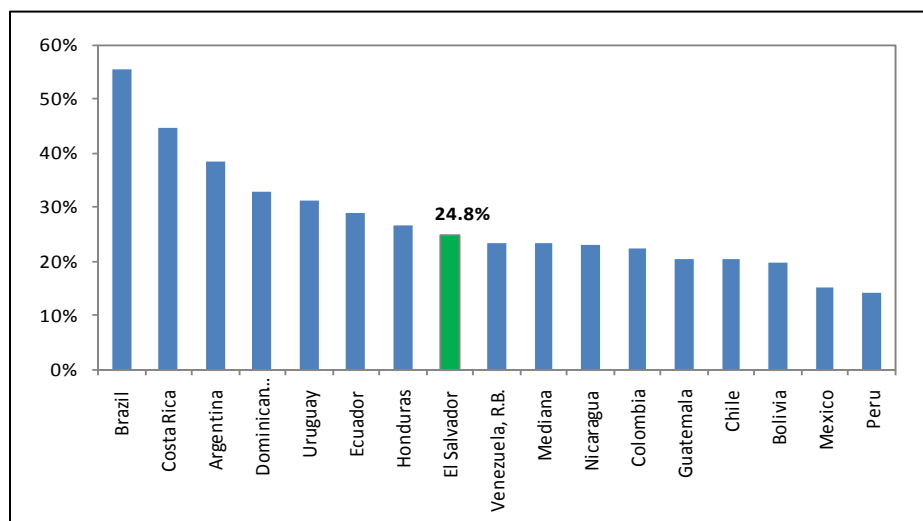
Source: Prepared taking data from the Superintendence of the El Salvador Financial System and from the Central American Monetary Council

Salvadoran interest rates are relatively low when compared with the rest of the countries of Central America (IDB 2005); however, despite dollarization of more than a decade, El Salvador has continued to keep a differential of at least two percentage points from the Panamanian financial system, which has the lowest rates of the region. Since 2009 the spread in El Salvador has placed very near the mean for this group of countries (see Figure 4.46); the data shows that since 2010 it has been higher than the estimate for Costa Rica, and similar to the one for Guatemala.

El Salvador's rates could be considered high with regards to the Panamanian benchmark, showing problems of risk in the banking market. Even during the years of higher growth (2006 and 2007), the Salvadoran spread remained significant and expanded considerably during the financial crisis, until it reached 5 percent at the end of 2010. However, seeing that economies that have similar or even higher levels of spread report better growth performance, there may be more important constraints in terms of access to finance and high cost of non-financial products.

According to the World Bank's Enterprise Survey (2006), 25 percent of Salvadoran companies identify access to financing as a serious or very serious obstacle, among one of the four most important problems, after crime, robbery and unrest (31 percent), informal sector practices (15 percent) and corruption (13 percent) (see Figure 4.46).

**Figure 4.46: Percentage of Companies that Identify Access to Financing as a Serious or Very Serious Obstacle**



Source: World Bank, Enterprise Survey 2006

Compared to the rest of the Latin American region, if we consider the identification of access to finance as a proxy for problematic intermediation, El Salvador would occupy a position closer to the mean (23 percent), weakening its importance; however, other related indicators such as the value of collateral necessary for a loan (as a percentage of the amount of the loan) indicate that the country is one of the five countries that requires a greater amount of collateral (151 percent), exceeding by 25 percentage points the mean for the region (see discussion on SME credit).

## b. Competition

The purpose of analyzing competition in one sector of the economy is to examine the existence of economic efficiency and to ensure the returns of the efficiency on costs can be translated into consumer wellbeing as the prices of goods and services drop and the quality and technological innovation increases.

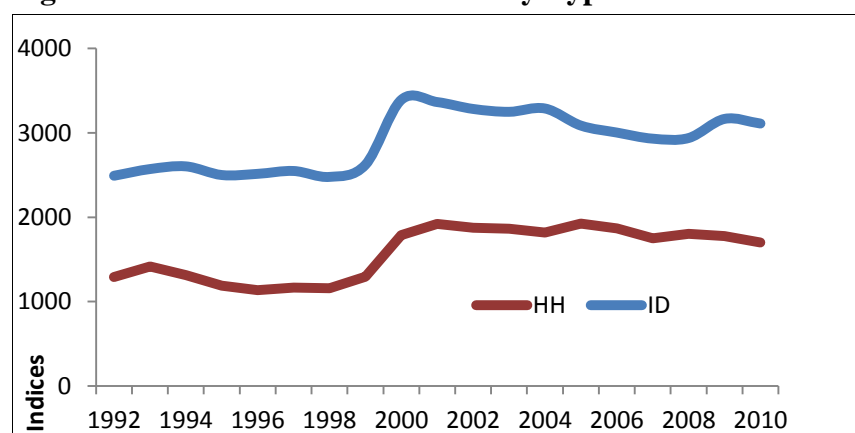
The lack competition in the banking industry has transformed the financial sector into a few conglomerates that concentrate the majority of assets and deposits of the financial system. This characteristic results in market inefficiency and affects consumers.

The Herfindahl-Hirshman and Dominance concentration indices increased in 2000 and remained relatively stable between 2000 to 2010, staying within the highly concentrated market classification interval (see Figure 4.47)<sup>13</sup>. The probability that competition could be affected increases whenever any industry operates under these conditions, since it facilitates collusion or non-competitive practices. The implications of a non-competitive market structure are, in

<sup>13</sup> US Federal Trade Commission (FTC), Comisión Federal de Competencia de México (CFC) and Tribunal de Defensa de la Competencia de España.

general, that the resulting price will be higher than that in a competitive industry, and quality of the good or service will be lower.

**Figure 4.47: Concentration Indexes by Types of Assets**



Source: SSF, 2010

The Herfindahl-Hirshman Index (HHI) for credit by size of company are over 2,000 points on the micro, medium and large enterprises, and exceed 4,000 points on the small enterprises. On the other hand, the dominance indexes exceed the 2,500 point level stated by the Federal Competitiveness Commission from Mexico as having a high probability of affecting competition (Superintendencia de Competencia 2007, 32).<sup>14</sup>

**Table 4.48: Concentration -Indexes According to Size (February 2007)**

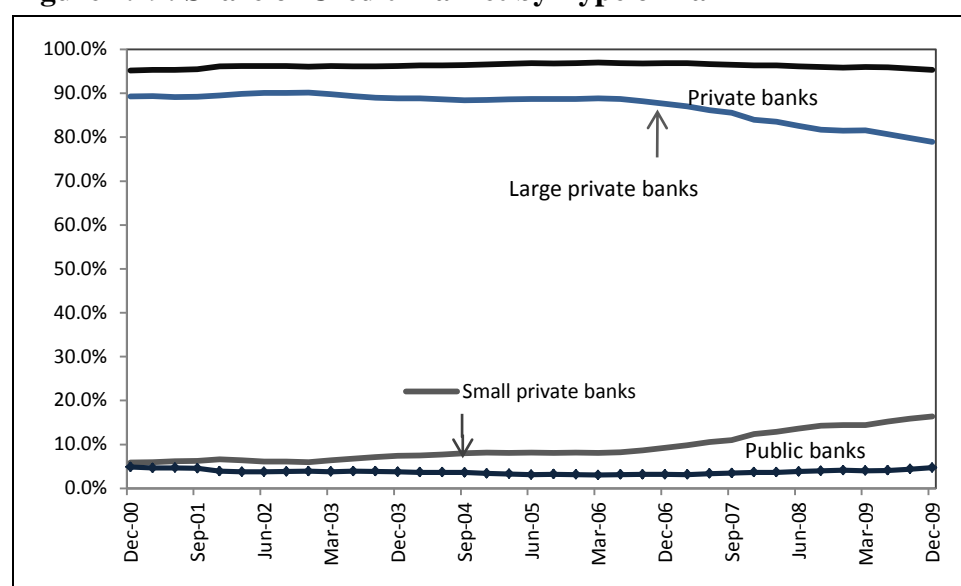
| Credit Classification | HHI     | DI      |
|-----------------------|---------|---------|
| Microenterprise       | 2,298.4 | 3,882.4 |
| Small                 | 4,624.9 | 8,994.8 |
| Medium                | 2,255.9 | 4,251.6 |
| Large                 | 2,798.2 | 3,654.7 |

Source: Prepared internally on data from Competitiveness Superintendence, 2007, Page 52)

Additionally, the private banking system represented approximately 96 percent of the Salvadoran credit market for the period between 2000 and 2009, of which 87 percent corresponded to the four largest banks of the system. In comparison, public banks represented an average of only 4 percent of the credit market, having a very limited contribution to financial intermediation. Consequently, the small group of private banks and the public banks do not have sufficient competition to move the interest rates to levels more in tune with the prevailing excess liquidity conditions (See Figure 4.49).

<sup>14</sup> Updated concentration statistics by size of company are unavailable

**Figure 4.49: Share of Credit Market by Type of Bank**



Source: (Fuentes 2010).

When looking at the relatively small number of banks in the Salvadoran banking system, however, it is also important to remember the size of the economy and banks' need for economies of scale.<sup>15</sup> (See Table 4.50).

**Table 4.50: Returns in the Financial System**

|                                       | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---------------------------------------|------|------|------|------|------|------|
| El Salvador Return on Assets (ROA, %) | 1.0  | 1.2  | 1.5  | 1.2  | 1.0  | 0.3  |
| Other Central America ROA (%)         | 2.1  | 2.1  | 2.2  | 2.3  | 2.3  | 1.7  |
| El Salvador Return on Equity (ROE, %) | 10.9 | 11.8 | 14.6 | 11.3 | 8.7  | 2.8  |
| Other Central America ROE (%)         | 23.4 | 22.8 | 23.5 | 23.8 | 23.1 | 16.3 |

Source: BCR, SSF and Central American Monetary Council

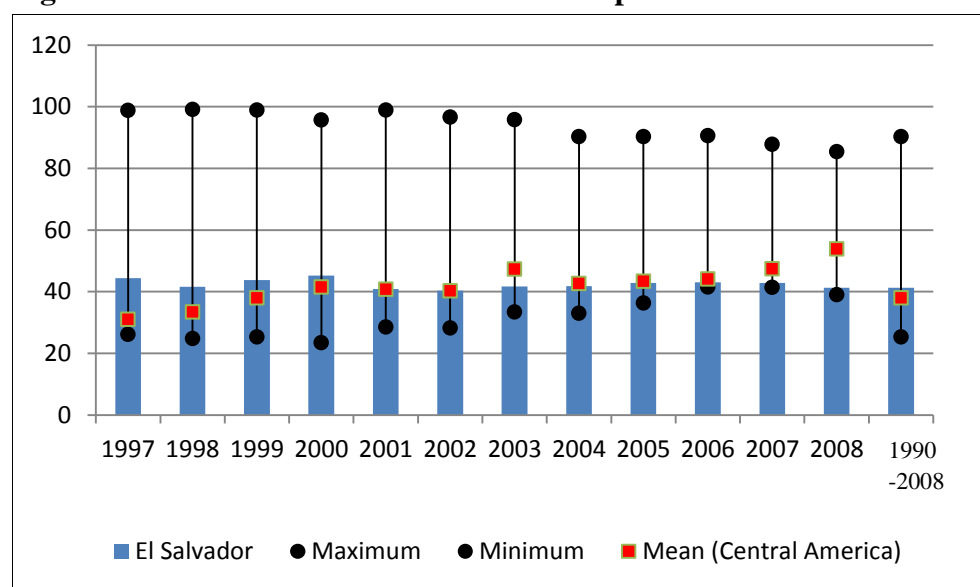
Between 1990 and 2008, El Salvador had a greater financial deepening than the mean for Latin America, as shown in Figure 1.52. During that period, the private credit sector reached a ratio of 40 percent as a proportion of GDP, whilst the mean was 26 percent<sup>16</sup>. However, ever since the banking crisis at the end of the nineties, El Salvador has been losing ground in access to credit, as shown in Figure. Since 2001, credit as a proportion of the GDP has been well below the mean of the region and has been unable to recover the levels reached between 1997 to 2000. As a

<sup>15</sup> In spite of its high operational efficiency, the banking sector in El Salvador appears to be among the least profitable in the region.

<sup>16</sup> However, if we compare El Salvador with countries in East Asia, credit as a percentage of GDP reached in the last forty years 77 percent and 74 percent, respectively. (Pages, La era de la productividad. Cómo transformar las economías desde sus cimientos 2010, 143)

comparison, Panama's economy is also dollarized but has the deepest financial access in the region.

**Figure 4.51: Credit to the Private Sector as percent of GDP**



Source: (World Bank, World Development Indicator Online Database 2010)

### c. Risk

Despite the elimination of exchange risk because of dollarization, financial contract terms have been stretched out, generating a modification of term structures; it seems that the business sector did not benefit from longer loan tenors, since the maturity structure for this segment has remained practically constant (Fuentes 2010). In other words, businesses have not been able to get longer-term loans.

Some of the reasons for the change in loan structures were: (i) the banking concentration process between 2005 and 2008; (ii) change in the business strategies of new competitors: global credit risk policies or financial institutions that specialize in credit to households, such as HSBC and Citibank, who offer mortgage and consumption credit<sup>17</sup>; (iii) foreign bank holdings being located in Panama, which is where they manage lending policy; (iv) the financial crisis' effects on financial conglomerates, which augmented retraction of credit in El Salvador without prior assessment of whether the Salvadoran banking system had positions in toxic assets; and (v) a negative understanding of the role of public banks within the banking industry, which resulted in these banks having marginal operations and not being efficiently competitive, as is the case in the Costa Rican and Guatemalan banking systems.

<sup>17</sup> Between 2004 and 2009, both banks represented 37 percent of the banking system's assets.

## 5. Returns to Economic Activity

If the problem with growth in El Salvador is not one of costly finance (as is the case for all but small and medium enterprises), then it must be because of low expected private returns to economic activities. This may be because the overall social returns to projects are low or because the share of the returns the firm can retain is low.

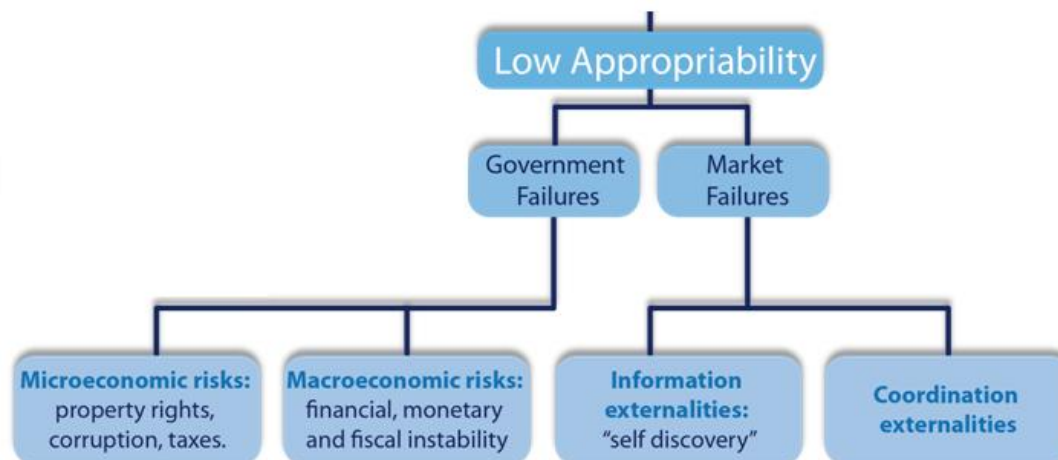
### A. Low Appropriability

Low appropriability in the economy is the “lack of the firm’s ability to reliably capture for itself the benefits in the future of its own investments and initiatives today” (Pritchett 2008). In order to test this hypothesis, this study employs the 4 tests outlined by Hausmann, Klinger and Wagner in their “Mindbook” on growth diagnostics (Ricardo Hausmann 2008):

- a) The (shadow) price of the constraint should be high
- b) Movements in the constraint should produce significant movements in the objective function
- c) Agents in the economy should be attempting to overcome or bypass the constraint
- d) Agents less intensive in the constraint should be more likely to survive and thrive, and vice versa: we should observe few thriving firms that are intensive in the constraint.

In certain nodes of the low appropriability branch these four tests are harder to employ since the branch deals with less measurable areas of interest and therefore shadow prices and measurable movements in a constraint are harder to calculate. As a result, the branch is at risk of receiving superficial treatment despite its importance. In order to avoid that trap, this study employs the four tests where possible and supplements that focus with other relevant evidence, such as cross-country comparisons and perception surveys in order to draw conclusions.

**Figure 5.1: The Low Appropriability Branch of the Growth Diagnostics Decision Tree**



### **Market Failures versus Government Failures**

The low appropriability branch is divided between market failures and government failures. The former explores the possibility that there are coordination and information failures within the market that are constraining growth. The latter explores the possibility that ineffective or insufficient government efforts in various areas are constraining growth.

#### **a. Is Crime a Binding Constraint to Economic Growth in El Salvador?**

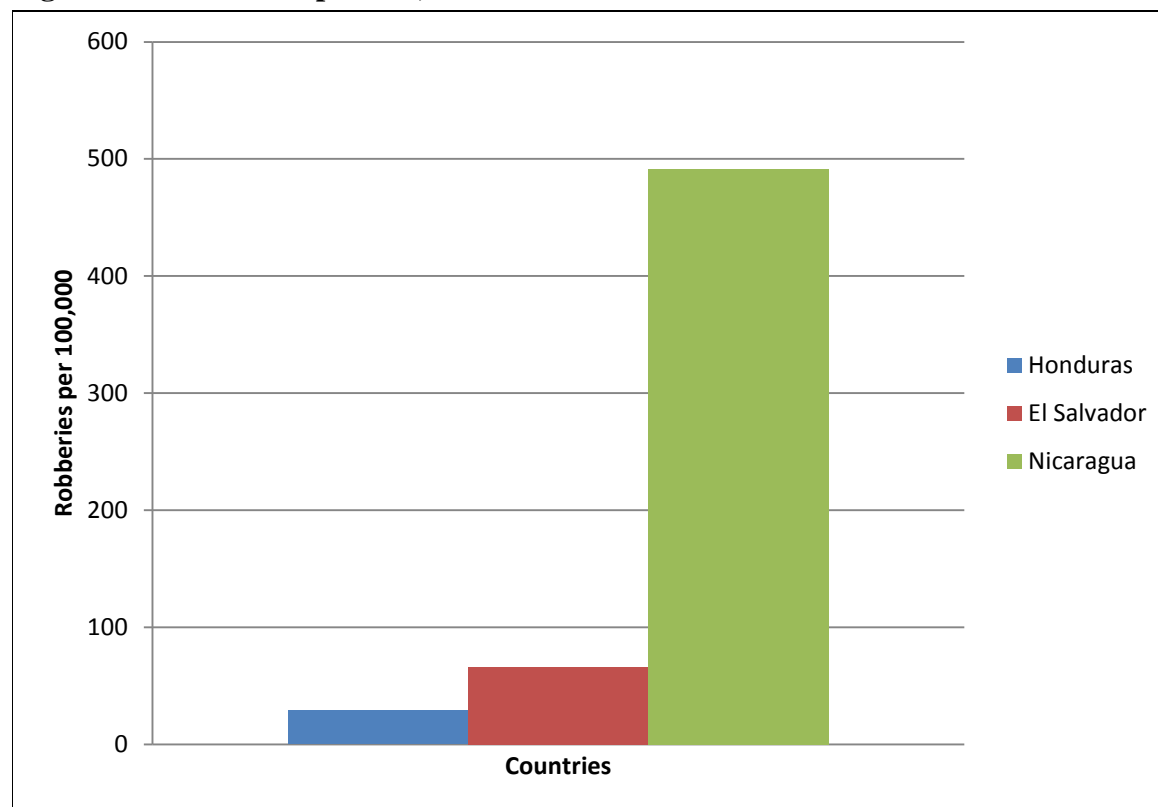
In the predominant literature on growth diagnostics, a variety of potential constraints are grouped together as “micro risks” (Ricardo Hausmann 2008). This is because the subjects studied in this area largely affect growth at the firm level, as opposed to having effects at the economy-wide level. Crime is not normally discussed at length within descriptions of the growth diagnostic methodology, but it must be considered as a potential constraint in the Salvadoran context due to the size and impact of the problem, and is rightly considered a “micro risk” because of its relationship with property rights and therefore investment decisions, and function similar to taxes of corruption as an additional cost to businesses. The prevalence of crime represents a weakening of property rights because it demonstrates government failures to protect property from unlawful seizure and reduces the ability of economic actors to reliably recover the returns of their investments. This study therefore considers crime as a potential constraint in this context.

Based on the evidence compiled, crime and violence is a binding constraint to economic growth in El Salvador. However, first it is necessary to establish that there is a crime problem in El Salvador. Ideally, we would do this by comparing statistics across countries in crime areas most directly related to economic growth. Presumably, these areas are theft, robbery and extortion, because they directly target property and the great prevalence of such activity would indicate weak protection for those property rights. Unfortunately, the lack of availability and reliability



of these statistics make them unhelpful in calculating the problem of crime in El Salvador relative to comparator countries. Based on analyses of U.S. data, there is cause to believe that crime is underreported systematically for many different reasons (Mosher, Miethe and Hart 2011, 93-94). Furthermore, OCAVI, the Central American observatory on crime and violence, attempts to collect crime data for all of its member countries and the effort falls short of being complete.<sup>18</sup> As a result, cross-national data on robbery is limited and probably misrepresentative, as the below graph shows:

**Figure 5.2: Robberies per 100,000 in 2008**



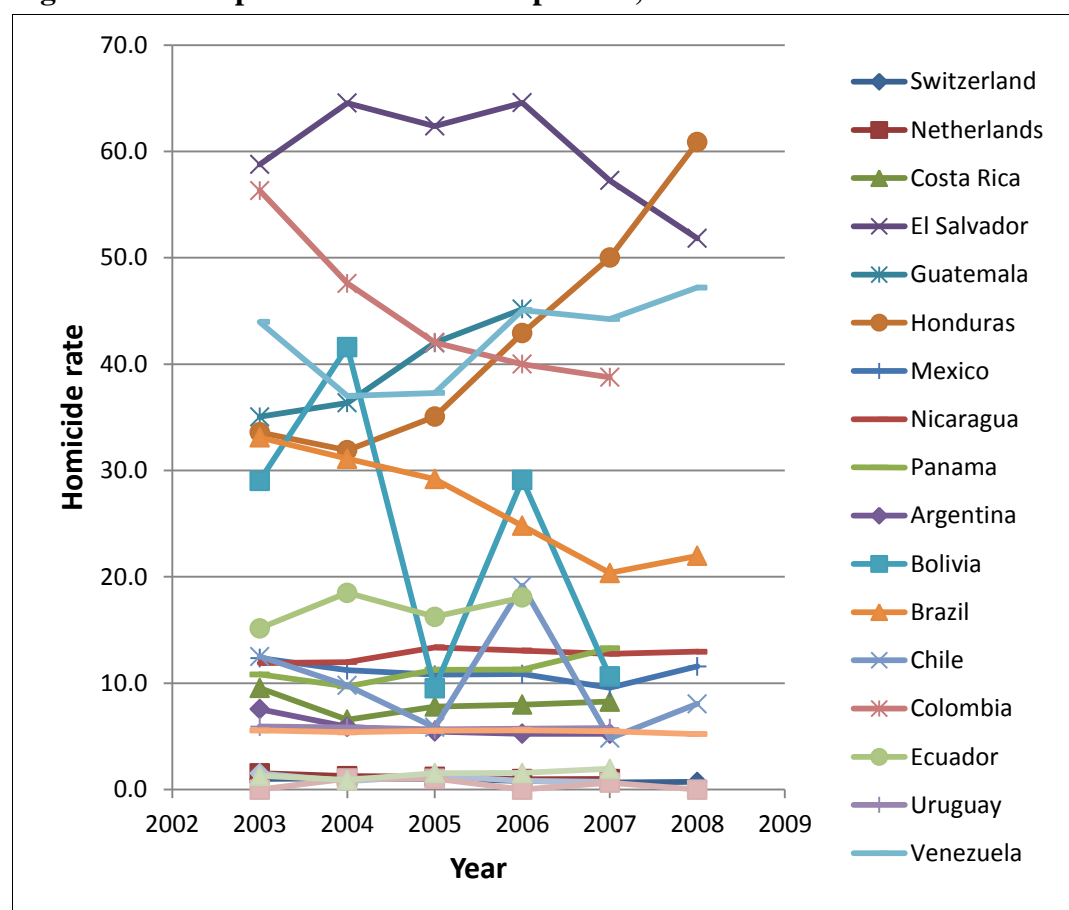
Source: OCAVI

The above data is likely misrepresentative for various reasons: it does not contain data on half of the Central American countries and, as will be shown directly below, Nicaragua's crime situation is less than or at most equal to the problem in El Salvador and Honduras, so it is very difficult to believe that the robbery problem in Nicaragua is more than 5 times that of Honduras or El Salvador. The rate of homicides per 100,000 is a much more common comparative metric used in the crime literature, and statistics are available for many more countries. While some of the same underreporting issues probably exist, the grim fact that homicides produce unavoidable physical evidence—dead bodies—make them more trustworthy statistics for cross-national comparisons. Performing such a cross-national analysis shows that El Salvador was ranked as

<sup>18</sup> Further measurement issues are discussed in a technical annex. This is not to suggest that PFG efforts should not investigate further the types of crime that most restrict economic growth in El Salvador.

the most violent country in Latin America in 2007, and the second most violent country in Latin America in 2008 by the UN Office on Drugs and Crime.<sup>19</sup>

**Figure 5.3: Comparison of Homicides per 100,000**



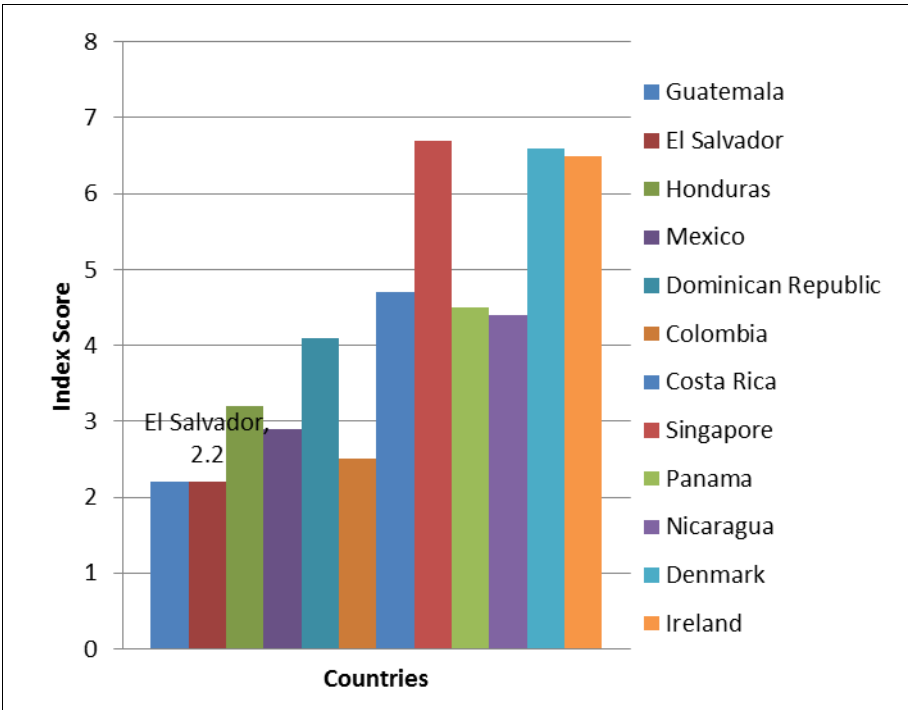
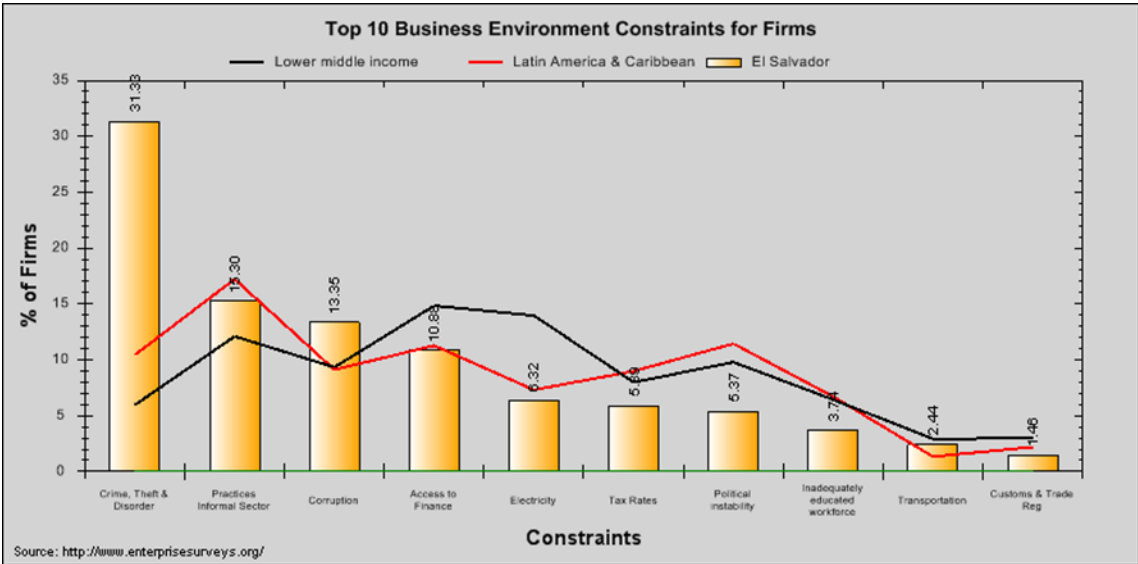
Source: UN Office on Drugs and Crime (UNODC), most recent statistics

Latin America's crime statistics are high compared to other world regions, meaning that El Salvador is often considered one of the most violent countries in the world, at least based on intentional homicide rates per 100,000. While these statistics are alarming, they do not necessarily mean that crime is a binding constraint to growth, it is necessary to analyze the effects of crime on the economy. Responses to the 2006 World Enterprise Survey show that over 30 percent of businesses thought of crime as a factor that constrains their operations in El Salvador, making crime and security issues by far the most frequently mentioned constraint by businesses. Rankings from the most recent World Economic Forum Global Competitiveness Report confirm the severity and persistence of the crime problem, as it is perceived by businesses. In addition to the results from the 2006 World Bank Enterprise Survey, Figure 5.3

<sup>19</sup> It should be noted that UNODC statistics on homicide were used for their comparability across many countries. UNODC data only goes up to 2008 at this time. Furthermore, imprecisions in crime measurements were discussed in this report, but most measures of El Salvador's crime situation put the homicides per 100,000 at between 50 and 70 per 100,000—still among the highest worldwide.

shows the index scores for the Organized Crime indicator for El Salvador alongside comparator countries from the region as well as a few reference countries from the developed world with similar geographic and population sizes.

**Figure 5.4: Business Perceptions of Crime—2006 World Enterprise Survey Results and the 2010-2011 Global Competitiveness Report Organized Crime Index Scores**

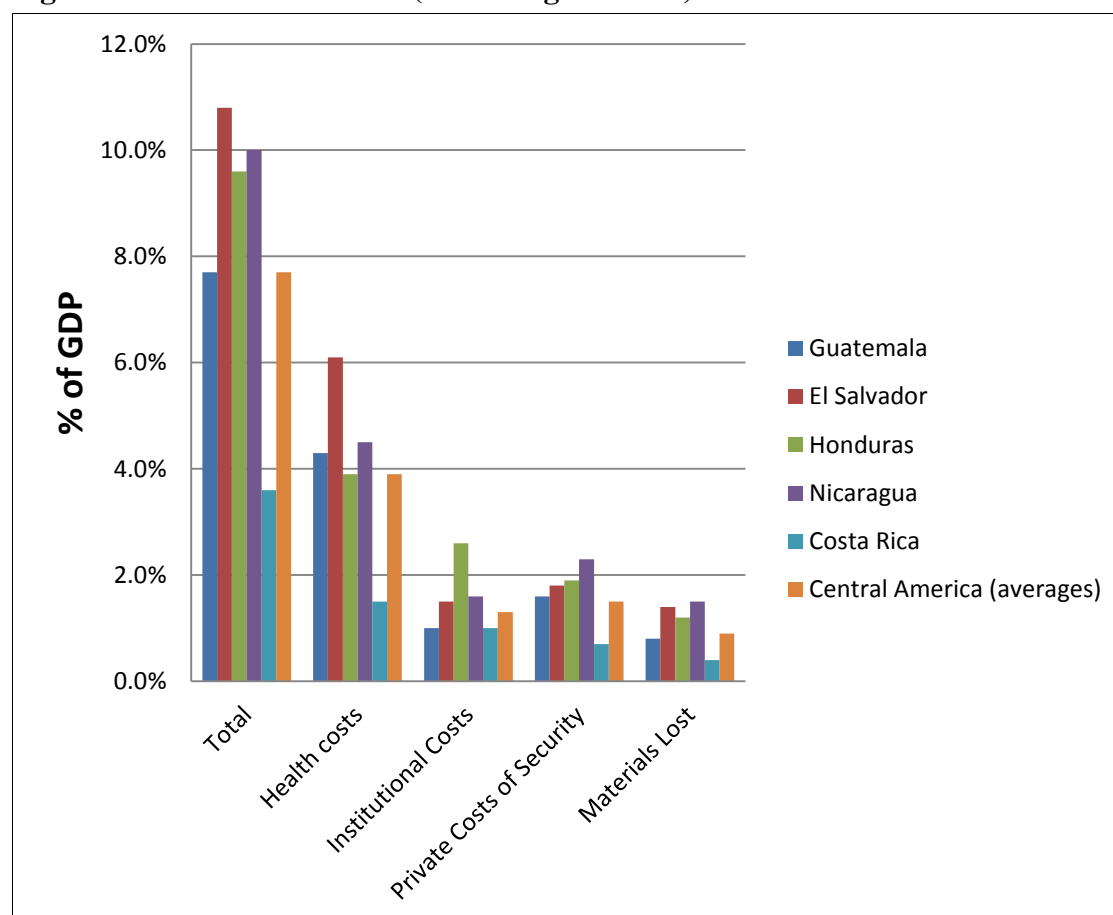


Source: World Economic Forum, the Global Competitiveness Report 2010-2011

Based on how the Global Competitiveness Report is calculated, lower index scores represent poorer performance on an indicator. In the case of the Organized Crime Indicator, El Salvador was the lowest ranked country of the 139 countries in the report.

Rankings in the Global Competitiveness Report provide further evidence suggesting that crime is a binding constraint to growth in El Salvador, but this ranking is still insufficient to make a determination because it is based solely on perceptions and surveys rather than cost estimates for crime that might serve to approximate a shadow price. Carlos Acevedo, using a variety of cost estimation techniques adapted from previous studies on cost estimation from the health field, calculated the costs of crime and violence in Central American countries divided between health costs, institutional costs, private security costs and the costs of lost materials. His results, as shown below, demonstrate that the annual total costs of violence in El Salvador, at 10.8 percent of GDP, exceeds the costs in all other Central American countries.

**Figure 5.5: Costs of Violence (Percentage of GDP)**

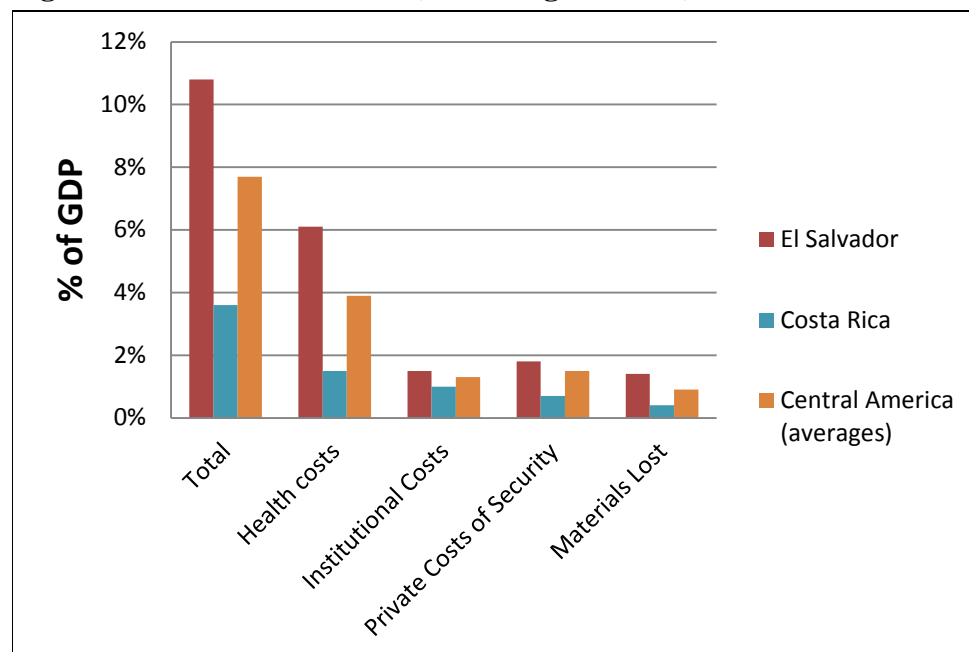


Source: (Acevedo 2008)

The above graph may not seem to indicate that El Salvador's costs are particularly exceptional relative to other countries in Central America, but it is important to remember that the crime statistics in Central America are exceptionally high when compared to the rest of the world. All

of the countries of Central America except for Costa Rica have homicide levels that are defined as “epidemic” by the Pan-American Health Organization (PAHO).<sup>20</sup> Comparing El Salvador specifically with Costa Rica, the only country in Central America without an “epidemic” level of violence, demonstrates the extent of El Salvador’s costs. The total costs of crime and violence in El Salvador, as calculated by Acevedo, are three times the costs in Costa Rica. These cost estimates represent the best approximation of a shadow price for crime and violence in El Salvador and provide strong evidence that crime is a binding constraint to growth in El Salvador.

**Figure 5.6: Costs of Violence (Percentage of GDP)**

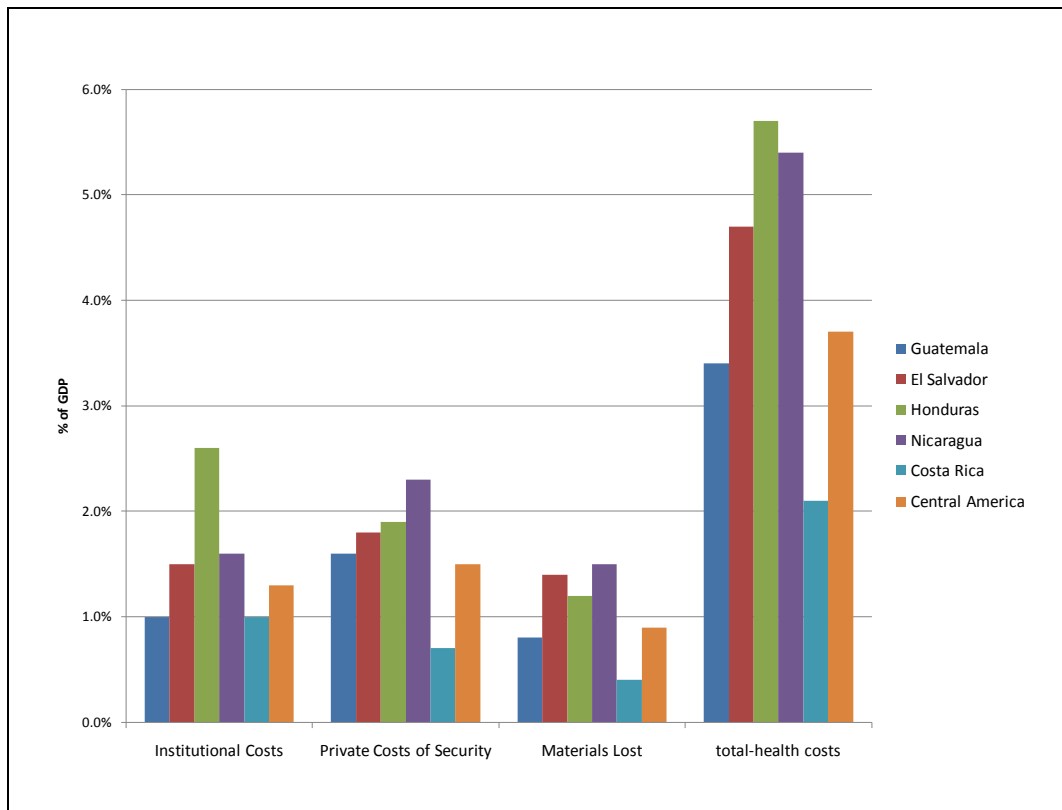


Source: (Acevedo 2008)

The above evidence is strong, but to a certain degree health costs capture some investment as well as some lost productivity, so it is worth repeating the exercise without health costs in order to remove any doubt about the validity of the results.

<sup>20</sup> According PAHO definitions quoted in Acevedo 2008, any country with a rate of 10 homicides per 100,000 people or higher has an “epidemic” level of crime.

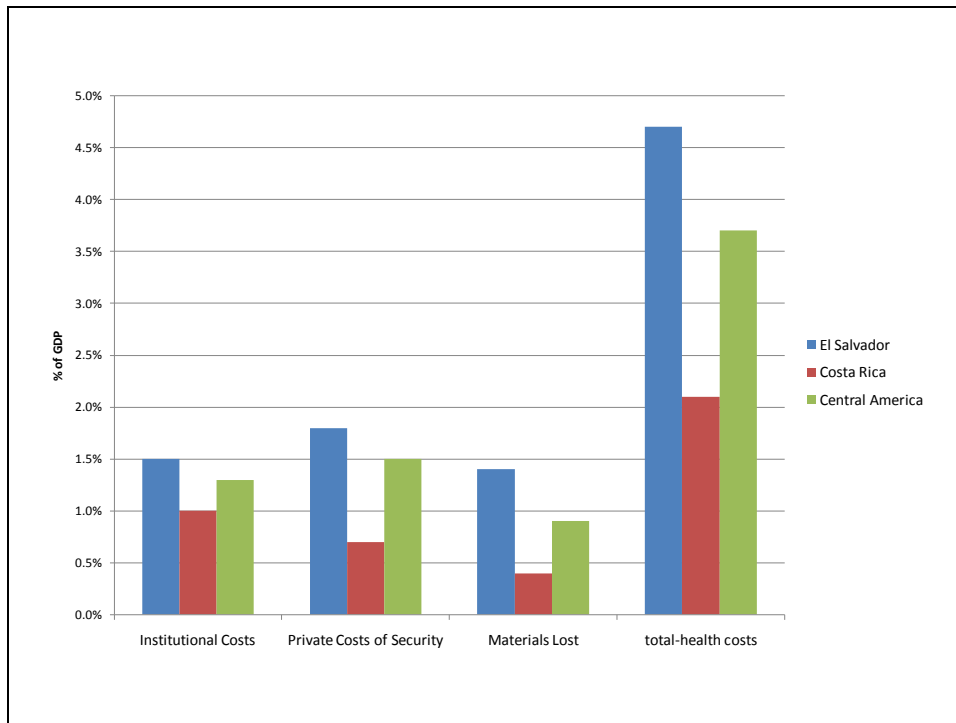
**Figure 5.7: Costs of Violence, Without Health Costs (Percentage of GDP)**



*Source: Acevedo, 2008*

Removing the health costs does show El Salvador spending less as a total than Honduras, which spends significantly more on the institutions to fight crime, and Nicaragua, which has significantly higher costs for private security. Nonetheless, El Salvador still appears to spend more than twice as much as Costa Rica and more than 1 percent of GDP more than the Central American average. Removing the health costs from this calculation in no way refutes the idea that El Salvador pays an extremely high shadow price for crime and violence issues.

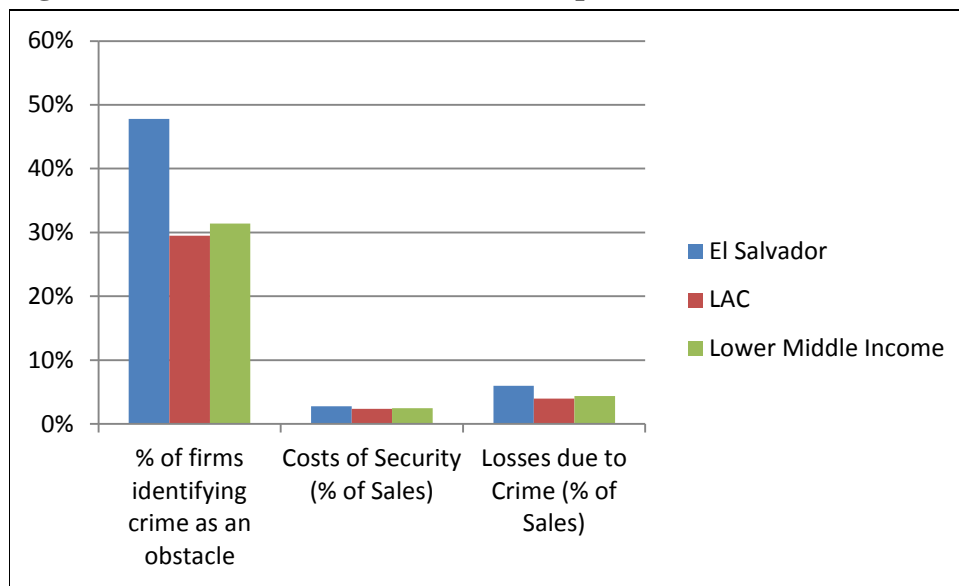
**Figure 5.8: Costs of Violence, Without Health Costs, El Salvador, Costa Rica and a Central America Average Only (Percentage of GDP)**



*Source: Acevedo, 2008*

Evidence of the business perceptions of crime and violence in El Salvador further support these cost estimates. A 2006 World Bank Enterprise Survey asked businesses of varying sizes throughout Latin America, as well as other lower-middle income countries, if they felt that crime was an obstacle to the operations of their business. According to the results shown, 47.8 percent of businesses in El Salvador identified crime as an obstacle to their operations, exceeding average affirmative responses from other Latin American and lower-middle income countries by more than 15 percent.

**Figure 5.9: Crime in El Salvador vs. Comparators**

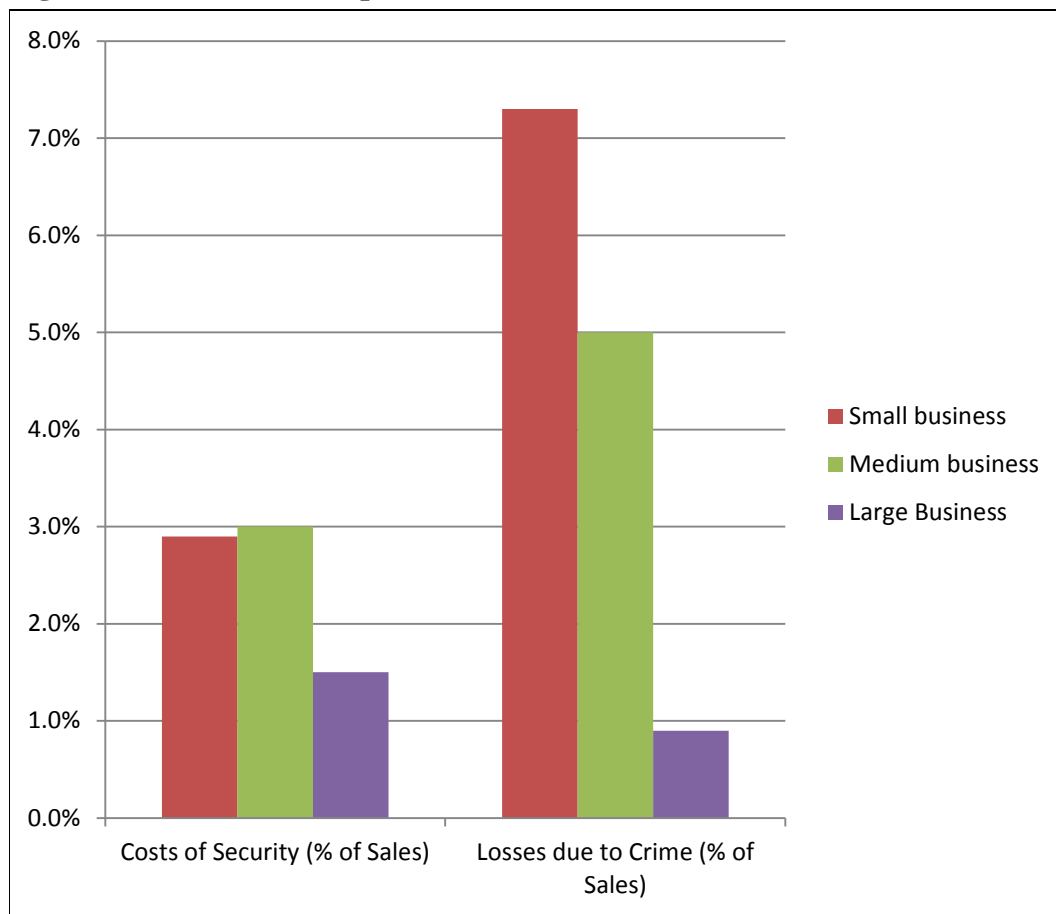


*Source: (World Bank, 2006)*

The 2006 World Bank Enterprise Survey also provides greater specificity regarding how these costs differently affect businesses of varying sizes. Small businesses spend less on security as a percent of sales than medium-sized businesses, likely because higher costs for alarms and guards price them out of that market. However, the losses due to crime of small businesses as a percent of sales greatly exceed losses of medium businesses and large businesses. This is probably largely due to the fact that small businesses simply have lower sales, meaning that any losses will appear as a higher percentage of sales, but a non-negligible component of this figure is likely due to the higher susceptibility of small businesses to crime. This evidence indicates that the crime situation is likely a bigger constraint for smaller businesses, which means that releasing that constraint could do more for economic growth, job creation and reducing inequality if, as some evidence suggests, the small business sector contributes disproportionately to those goals.



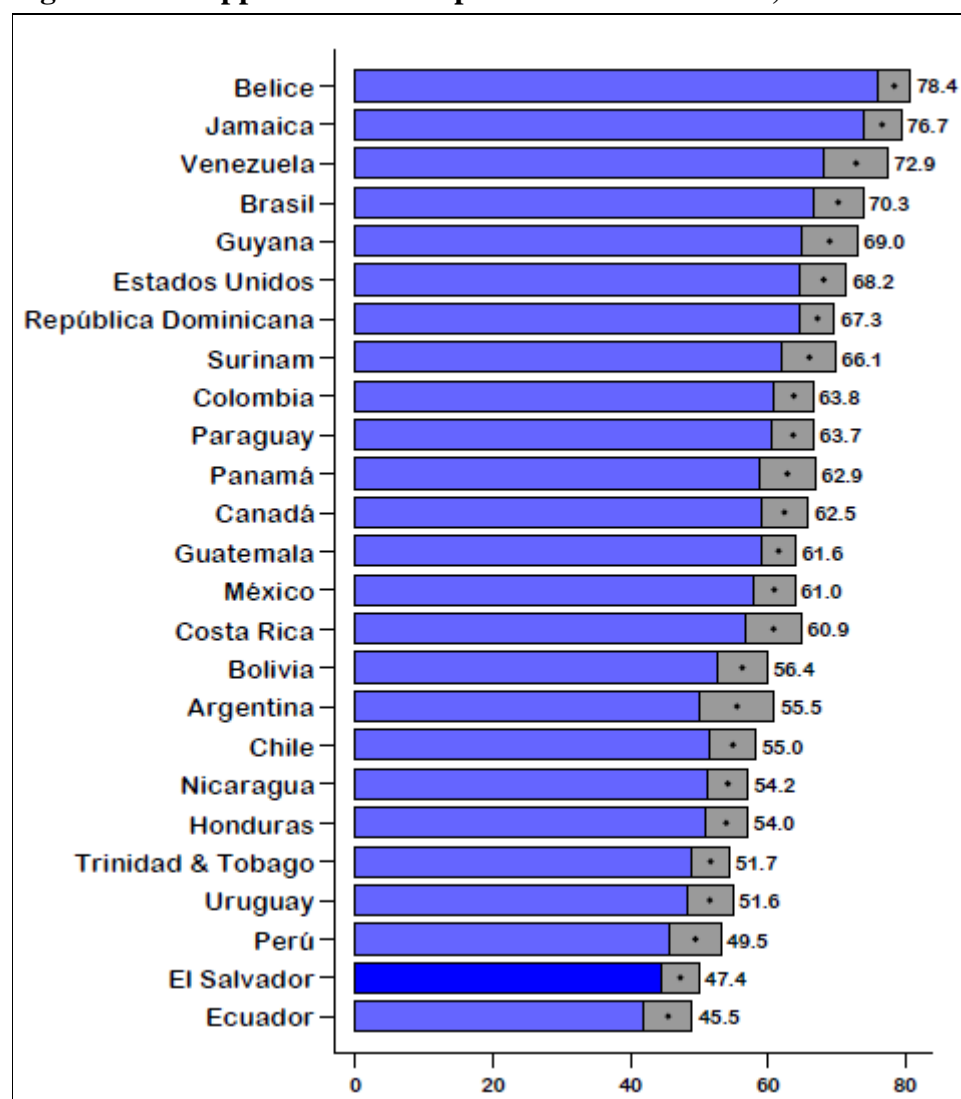
**Figure 5.10: Crime Costs per Size of Business**



*Source: (World Bank, 2006)*

Recent surveys on democracy in Latin America underscore the severity of the crime problem in El Salvador. A recent America's Barometer survey asked respondents in most countries in the Western Hemisphere about their level of support for the respect of the Rule of Law in their country. Respondents in El Salvador were the second least supportive of respecting the Rule of Law in their country, second only to Ecuador. Based on an analysis of determining factors for that response, only age, perceptions of insecurity in the country, and the level of confidence in the justice system were factors that are statistically related.

**Figure 5.11: Support for the Respect of the Rule of Law, Various Countries**



Source: (Macias, Cruz and Seligson 2010)

This evidence shows that, at the very least, the crime situation in El Salvador is significantly correlated with low levels of respect for the Rule of Law in El Salvador. This is a troubling and dangerous trend, largely because it is difficult to predict what may happen if it does not reverse course.

Applying the four tests to the crime situation in El Salvador seems relatively straightforward, but we will delve deeper to solidify the case.

### **1. The shadow price of the constraint should be high**

Based on the calculations above taken from the analysis done by Carlos Acevedo, a shadow price for crime could be 10.8 percent of GDP which are high even by comparison with other Central American countries with severe crime problems. One rebuttal to this estimation might be that

this 10.8 percent of GDP figure does not represent an appropriate shadow price because it does not represent GDP lost due to crime as much of that 10.8 percent figure is still captured on expenditures on healthcare to address wounds from crime and job creation through private security firms. Removing the healthcare component still showed that roughly 4.8 percent of GDP was lost due to crime in El Salvador, well higher than the Central America average and more than twice as much as Costa Rica, the only country in the region without an epidemic level of crime. Also, while it may be true that some of the healthcare expenses represent investment, it is indisputable that much of the money spent on security would be spent more productively on other activities.

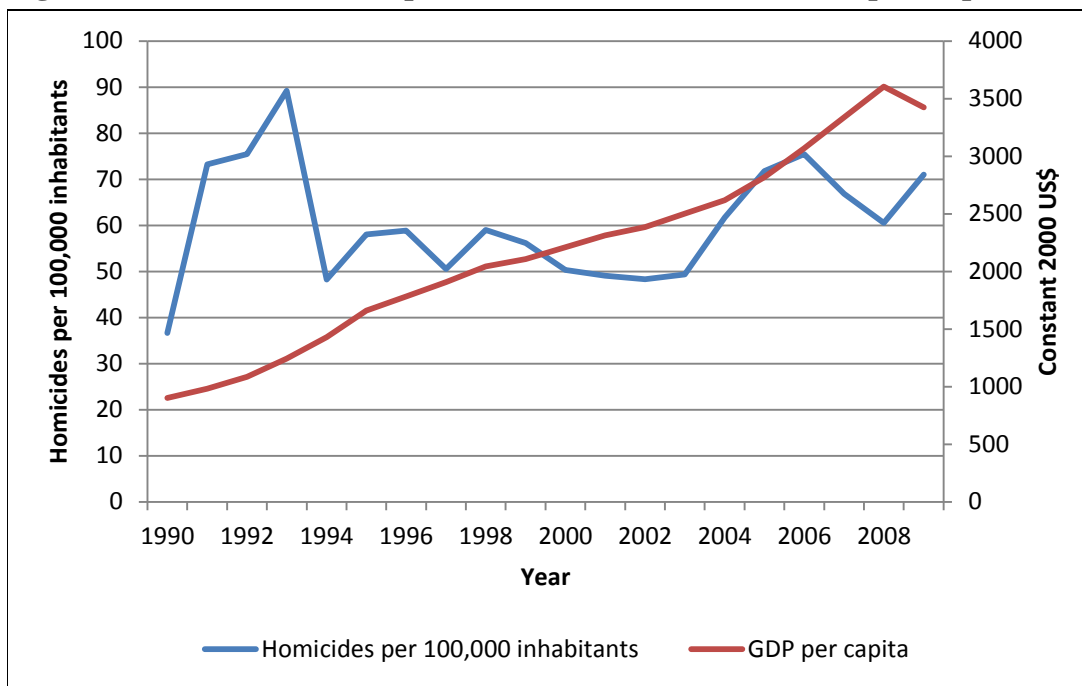
A recent American Chamber of Commerce in El Salvador survey reports respondents spend an average of 7.7 percent of their expenditures on security. When respondents were asked what they would dedicate their security expenditures to if crime was decreased, 33.8 percent responded that they would use those expenditures on human capital development, 20.3 percent responded that they would spend on new areas of work, 16.2 percent said they would spend on research and development and 13.5 percent said they would expand into new markets (Salvador-AmCham 2011). All of these uses add significantly more value and economic growth to the economy than expenditures to address wounds resulting from crime and jobs in the private security industry.

Lastly, a study conducted at the Universidad Centroamericana in El Salvador cited an analysis saying that crime in Latin America has resulted in investors foregoing 16 percent of gross fixed capital formation. This study repeats this methodology just for El Salvador and shows that the country annually lost 0.47 percent of GDP worth of foregone gross fixed capital investment from 2005-2008 due to crime (Gallegos, et al. 2009). This figure can be added to the above costs, resulting in the very high shadow price for crime in El Salvador. The evidence clearly directs us to conclude that the shadow price of crime on economic growth in El Salvador is extremely high and indicative of a binding constraint to economic growth.

## **2. Movements in the constraint should produce significant movements in the growth rate**

This test ultimately proves the most difficult to apply in the El Salvador context. Ideally, this test is applied over time, and a determination of a binding constraint would show that during some period in which the constraint was relaxed, the economy grew more rapidly. We can perform such research for El Salvador, but more than anything it shows that over the past 20 years there was no period in which the constraint of crime was truly relaxed. Homicides per 100,000 inhabitants have exceeded 45 homicides per 100,000 for all but the first year of the entire period. This rate exceeds the epidemic level of crime as defined by PAHO by a factor of 4.

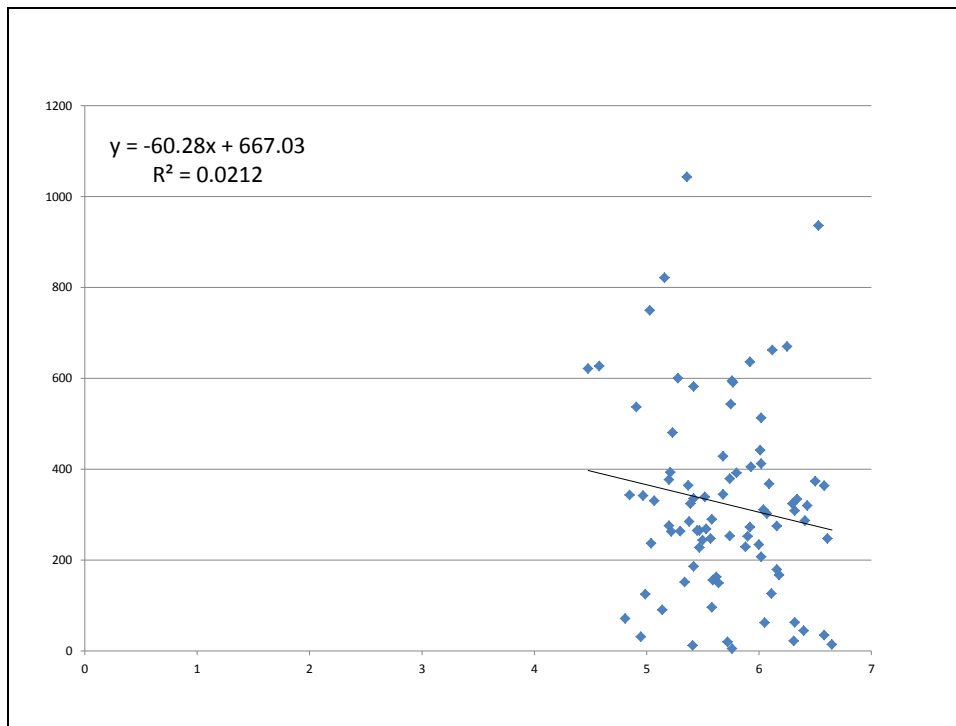
**Figure 5.12: Homicide Rates per 100,000 inhabitants and GDP per Capita over time**



*Source: Author's calculation based on UNODC data and World Bank data*

Given the inability to apply this test based on movements over time, we can attempt to apply this test based on movements across space. That is, we can find out if areas of El Salvador that seem less affected by the constraint of crime are growing faster or are determined to be better environments for investment. In order to do this, we take statistics of robberies—which are available in disaggregated fashion for El Salvador—and correlate them with scores on a recently completed Municipal Competitiveness Index, which rates how competitive a municipality is for economic activity based on perception surveys and some objective factors. This indicates a result that provides some evidence that more competitive municipalities are also municipalities with lower rates of robberies per 100,000.

**Figure 5.13: Robberies per 100,000 vs. Municipal Competitiveness Index Score**



*Source: Author's calculation based on Government of El Salvador data and data from the Municipal Competitiveness Index (USAID, 2009)*

In other words, this provides some support that movements in the crime constraint, represented by robberies per 100,000, produce the predicted movements in the objective function, represented by the Municipal Competitiveness Index score, although in this case this is over space and not time. Based on this information, the second test seems satisfied, if not overwhelmingly so.

### **3. Agents in the economy should be attempting to overcome or bypass the constraint**

In addressing the first test we went fairly far in addressing this test as well. Many of the costs cited are costs incurred by businesses in order to overcome the problems of crime. It is worth mentioning again, however, the American Chamber of Commerce of El Salvador survey saying that businesses spend 7.7 percent of their expenditures on security costs. A further measure of how agents are overcoming or bypassing the constraint of crime in the economy would be to consider overall expenditures on private security in El Salvador. A study conducted at the Universidad Centroamericana, citing an Acevedo (2007) paper, estimates that businesses and private families combined spent 4.7 percent of GDP on private security in 2007 (Gallegos, et al. 2009). Startlingly, the same report mentions that while there were 16,000 policemen in the Policia Nacional Civil in 2007, 400 private security firms employed over 25,000 private security guards. This indicates that private security guards, which represent one of the ways agents are trying to bypass the constraint of crime in El Salvador, outnumbered official police in 2007 by a

ratio of greater than 3 to 2. Clearly, agents are working very hard to bypass the binding constraint of crime in El Salvador.

**4. Agents less intensive in that constraint should be more likely to survive and thrive, and vice versa.**

Lastly, larger businesses that are more capable of absorbing costs of private security see far lower losses as a percent of sales than smaller businesses that are less able to pay for private security measures. This was examined earlier in this chapter, citing evidence drawn from the World Enterprise Survey from 2006. Furthermore, anecdotal—and sometimes gruesome—evidence from interviews and news stories of businesses that are in particularly susceptible industries to crime accentuates how agents who are more intensive are particularly suffering. In a focus group conducted for this study, some delivery companies mentioned how they now refuse to deliver to certain areas of the country they consider particularly dangerous. Busses and bus drivers have been particularly and repeatedly affected by violent extortions. This fact was crystalized by events last summer when a bus was set fire, killing 17 individuals trapped inside and by later bus strikes in response to retaliation threats from gangs that they would specifically target busses. During the strike, 80 percent of public transportation was shut down resulting in economic losses estimated in the millions of dollars as businesses had to close due to the inability of employees to show up for work (BBC 2010). Moreover, we heard from call centers and enterprises in the special economic zones that they have to do extensive background checks on job applicants extending back to applicants' relatives' US contacts to avoid hiring persons with relations to organized crime. We also heard from international couriers that they will not deliver to some zones in El Salvador. While this is largely anecdotal information, it is strong and paints a complimentary picture to the hard data that crime inhibits economic activity. Based on this analysis, the fourth test confirms that crime is a binding constraint to growth in El Salvador.

## **Conclusion**

The application of these four tests clearly indicates that the crime situation in El Salvador is a binding constraint holding back the country's economic growth prospects. Furthermore, it is almost certainly the single most binding constraint. It may also be a danger that threatens the significant progress El Salvador has made since the end of its civil war in the early 1990s. The clarity with which this constraint is demonstrated underscores the severity of the situation.

It is important to note here that the crime problem in El Salvador is far more than an economic problem. Due to the methodology this study employs, it must deal exclusively in facts and figures and stress their relationship with economic growth. However, the crime and security problem in El Salvador has several consequences that are largely unquantifiable in terms of economic costs but are nonetheless central to the overall effects of crime: the emotional and psychological toll resulting from the murder of loved ones, the almost pervasive fear of being a victim of crime, the erosion of social capital, and the effect on opportunities and decisionmaking

for the citizens of El Salvador. None of these issues is mentioned at length in this study, but the impact of these issues in their own sphere exceeds the level of economic loss we observe here. The existence of these issues only serves to reinforce the importance of addressing this binding constraint to growth in a serious and focused manner—El Salvador’s crime problem goes far beyond being an economic problem; it also has a tremendously damaging social effect that must be addressed. In this sense, it is important to note that recognizing crime as a binding constraint and addressing public efforts to mitigate it, would likely bring forth large benefits to the Salvadoran society as a whole. As such, tackling crime is very likely to provide overarching benefits to the society that would spill over directly to the livelihood of the majority of Salvadorans, thus promoting economic growth and greater social and economic equality. These social effects, that go beyond the potential economic impact of removing this constraint, underscore the great importance and opportunity that would come from addressing the crime situation in El Salvador.

The purpose of this study is to identify what the binding constraints are, not what to do with them. However, it is worth noting that the crime problem in El Salvador is extremely complex and its causes and effects are multiple. Homicide statistics were used here as the basis for an examination of the crime problem in El Salvador because of their greater consistency and more reliable comparability across countries, which is extremely helpful in applying the growth diagnostic methodology. That does not imply, however, that homicides are the principal driver of the effect of crime on economic growth in El Salvador. Several types of crime, such as robbery and extortion, may have stronger direct impacts on reducing economic growth but the lack of good comparative statistics about these crimes led to their omission from the study.<sup>21</sup> Furthermore, this section did not go into further detail about the potential causes of the crime levels in El Salvador. However, at the risk of suggesting a policy direction for this initiative after this study, crime’s interaction with rule of law weaknesses in El Salvador is worth noting. As was shown earlier in this section, perceptions of insecurity in El Salvador and a lack of respect for rule of law are correlated at a statistically significant level. It may be difficult to determine causality between rule of law problems and crime problems in El Salvador, but it seems undeniable that there are interrelated problems in these two areas. Any serious effort by this initiative to solve this problem should examine in depth these various causes and effects.

## **b. Political Uncertainty**

Political uncertainty in this context refers to the concern that economic and social policy in El Salvador does not follow a consistent course, but rather changes erratically from one set of goals to another. Political uncertainty is not commonly considered as a potential binding constraint within growth diagnostics, but the level of concern expressed recently in El Salvador regarding

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<sup>21</sup> Illustrative of the problem of statistical availability on these crimes is the fact that the UNODC, which is commonly pointed to as the best available source for crime statistics, only had statistics on robberies in Central America for any country for the 2005 and 2006 years during the period from 2003-2008. To examine this dearth of statistics, feel free to access this data here: <http://www.unodc.org/unodc/en/data-and-analysis/crimedata.html>

this issue merited its inclusion in this study. Several news stories have reported on concerns from the private sector regarding the level of political and policy uncertainty recently, and Standard & Poors downgraded El Salvador's credit rating in January, citing "a growing divide between President Mauricio Funes and the nation's Congress that threatens to derail economic reforms" (Reuters 2011) (La Prensa Grafica 2010) (Alle 2011). While these concerns and stylized facts merit further investigation, they do not necessarily constitute evidence of a binding constraint. Based on the information available, this does not appear to be a binding constraint to growth, although there are issues with political uncertainty in the country that may be worth addressing.

Measuring political uncertainty, especially as it relates to economic outcomes, is a difficult task, which makes coming to a conclusion about this area more difficult. Many studies draw conclusions about the relationship between political uncertainty and economic growth, finding that increased political uncertainty does in fact reduce economic growth. Ari Aisen and Francisco Jose Veiga of the IMF measured political uncertainty or instability by counting the number of times in a year a new leader was named or, at minimum, 50 percent of cabinet posts changed hands. Unsurprisingly, they found that political uncertainty of this type and magnitude has a significant negative effect on economic growth. They do attempt to further disaggregate the effects of political uncertainty on economic growth by creating four additional indices, which include measurements of constitutional changes, coups, executive changes, government crises, number of legislative elections, a fragmentation index, and a measure of revolutions (Aisen and Veiga 2011). These results show that political uncertainty negatively affects economic growth, but replicating this analytical method in the current Salvadoran context would not capture the type of political uncertainty currently being discussed.

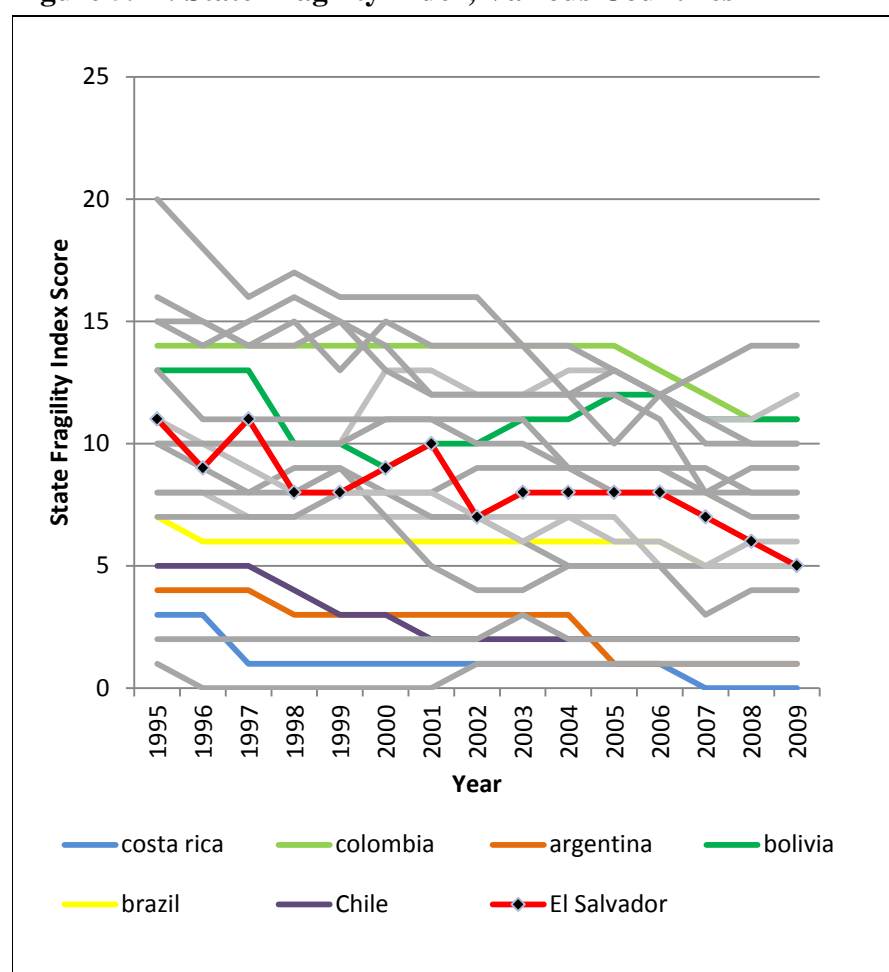
Richard Jong-a-Pin delves further into potential measurements of political uncertainty and develops one area of political uncertainty which measures uncertainty *within* a political regime. This area of political uncertainty includes measurements of changes in the executive, veto players who drop from office, fractionalization, years of ruling party in office, polarization, number of elections and government crises. This measure of political uncertainty to some extent approximates the perceived uncertainty currently taking place in El Salvador, but Jong-a-Pin finds that such uncertainty *positively* affects economic growth, although his results are not statistically significant (Jong-a-Pin 2009). Finally, Dani Rodrik developed a theoretical model where political uncertainty, interpreted as the probability that the government will reverse a policy that is already in place, is considered as a tax on the business sector when there is a risk. He does not develop a model himself, saying that it would not meet econometric standards, but does quote other studies which indicate that the harmful effects of political uncertainty may outweigh the beneficial effects of even good economic policy (Rodrik 1989). Rodrik's concept of political uncertainty could help measure the level of political uncertainty in El Salvador and its effects on economic growth, but there is no way of making his concept actionable and defensible. Despite a number of good ideas and research papers on the effects of political



uncertainty on economic growth, the specific concerns regarding political uncertainty in El Salvador are not captured by these methodologies.

As a result of this dearth of approaches to studying the particular circumstances of political uncertainty in El Salvador, this study relies on available evidence from a variety of sources. One source that is used by all of the studies described above is the Polity IV indicator set. Polity IV produces an annual State Fragility Index that serves as a measure of the stability of a political system in a given country. The State Fragility Index is a composite of a variety of measurements of a country's effectiveness and legitimacy in security, political, economic and social aspects. It is based on hard data regarding events that are occurring in a particular country—such as small-scale wars or violence to help determine security effectiveness—or current conditions of the country—such as the GDP per capita to help determine economic fragility. Each of these areas is scored on a 0 to 3 scale—except for the economic effectiveness indicator which is scored from 0 to 4—and then the scores are compiled to create a country's score on the State Fragility Index. The scores on that index go from the best score of 0, or “no fragility” to 25, or “extreme fragility”. El Salvador compares well with other Latin American countries, as well as reference countries of similar geographic and population composition. Furthermore, the trend in El Salvador is consistently downwards, towards less fragility.

**Figure 5.14: State Fragility Index, Various Countries**



Source: Polity IV State Fragility Index Scores, 1995-2009<sup>22</sup>

The above figure suggests that, at least at a macro level, El Salvador is not significantly more politically uncertain or unstable than any relevant comparison country and, in most cases, it is in fact less politically uncertain.

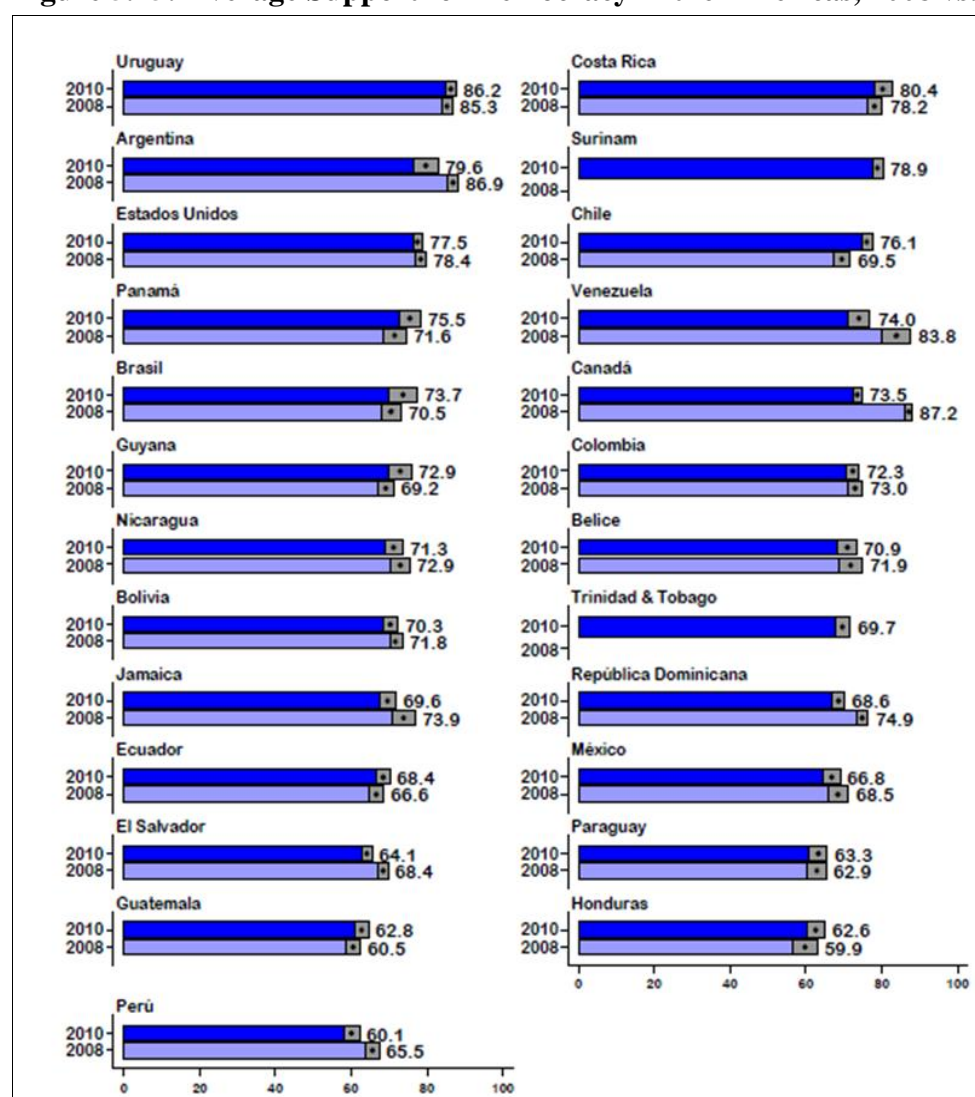
One criticism of this is that it fails to account for the most recent two years, since the latest measurement of the State Fragility Index is from January of 2009, before the FMLN party took control of the government for the first time in El Salvador's history. Since this was a significant change, the State Fragility Index may be missing a very critical data point showing a significant increase in uncertainty. There is no perfect way to respond to these criticisms, but evidence from a recent survey of democratic and government sentiment conducted by America's Barometer does help provide a more in depth story. In conjunction with related surveys conducted around Latin America in 2010, Ricardo Córdova Macías, José Miguel Cruz and Dr. Mitchell A Seligson conducted a survey in El Salvador about various issues and topics related to democratic

<sup>22</sup> For the sake of clarity and readability, we did not assign a color to every line of this graph or include every country in the legend. The countries included in this graph were Latin American countries and the following reference countries: Israel, Malaysia, Singapore

governance. Since the previous survey was conducted in 2008, this survey data provides a good perspective on changes of perceptions of democracy and political certainty since the change in government. Perceptions of political uncertainty are somewhat different than the reality, but when it comes to investment and economic growth, negative perceptions of democracy and increasing perceptions of political uncertainty should have similar effects as the reality of decreasing democracy and increasing political uncertainty.

Generally, the survey data showed that the level of support for democracy in El Salvador dropped slightly between 2008 and 2010, but not significantly and El Salvador remained within normal ranges for Latin America, albeit on the lower end of the scale.

**Figure 5.15: Average Support for Democracy in the Americas, 2008 vs. 2010**

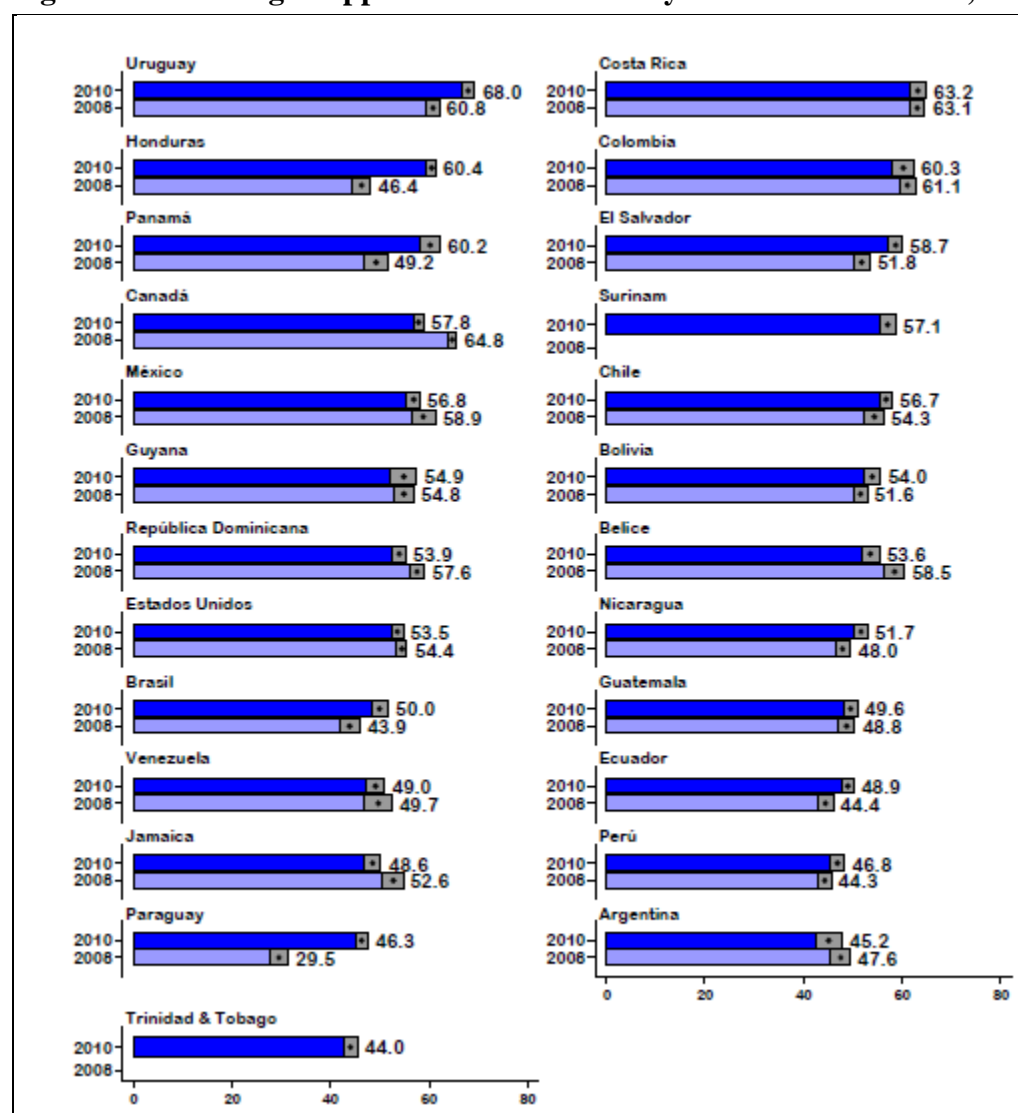


Source: LAPOP America's Barometer Survey

While support for democracy decreased, support for the political system increased from 2008 to 2010. El Salvador now ranks sixth among 25 countries in the Americas, ahead of Canada,

Mexico, the United States and Brazil. This seems like a paradoxical result, since support for democracy decreased while support for the political system increased, despite the fact that democracy is the political system. This could be a result of a misunderstanding that democracy is the political system, or a different interpretation of what the political system is in El Salvador. Regardless of the explanation, neither of these responses demonstrates unequivocally that political uncertainty is a binding constraint to economic growth in El Salvador.

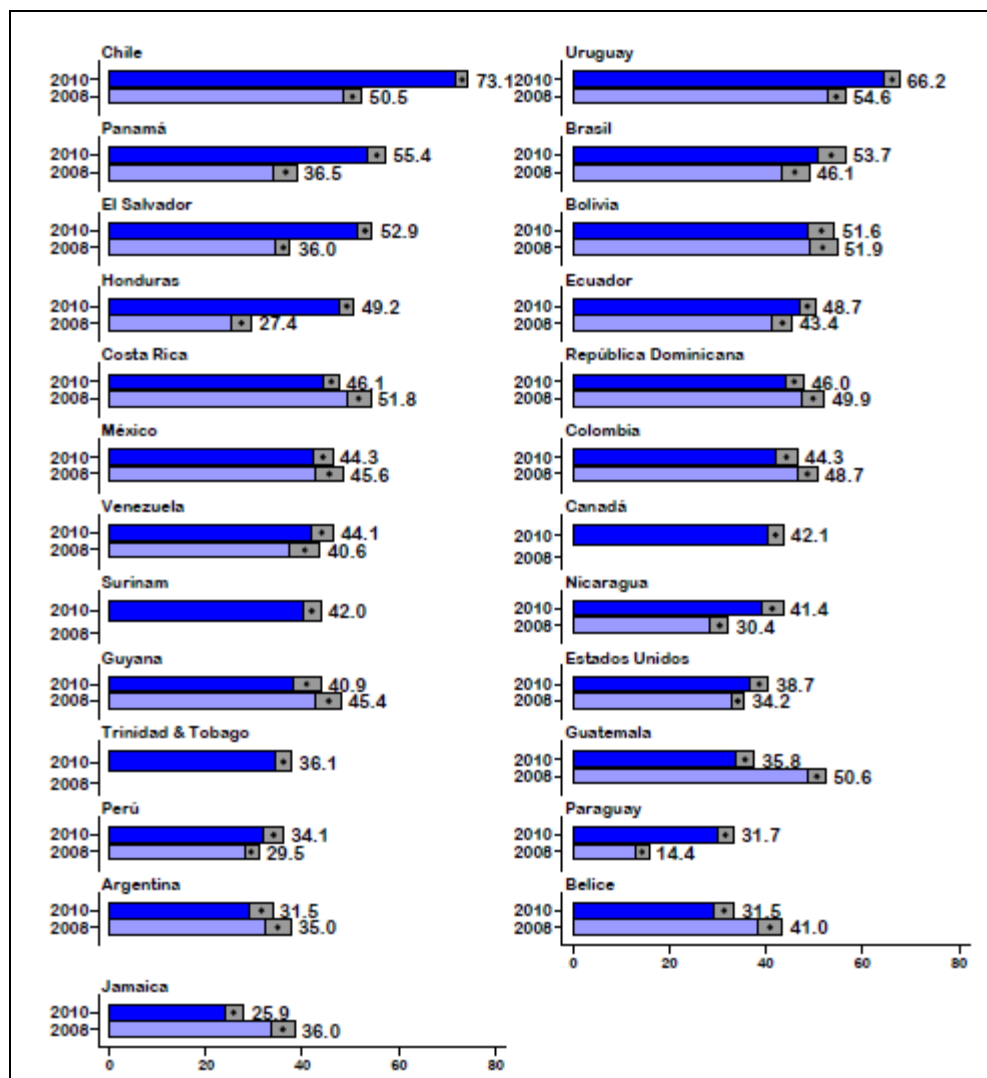
**Figure 5.16: Average Support for the Political System in the Americas, 2008 vs. 2010**



Source: LAPOP America's Barometer Survey

Specifically related to the economic management of the country, which is a more relevant element of political uncertainty, the LAPOP America's Barometer survey demonstrates a sharp increase in public perception. Contrary to what one would expect if political uncertainty related to economic management was on the rise, public perception of economic management by the government improved by nearly 47 percent.

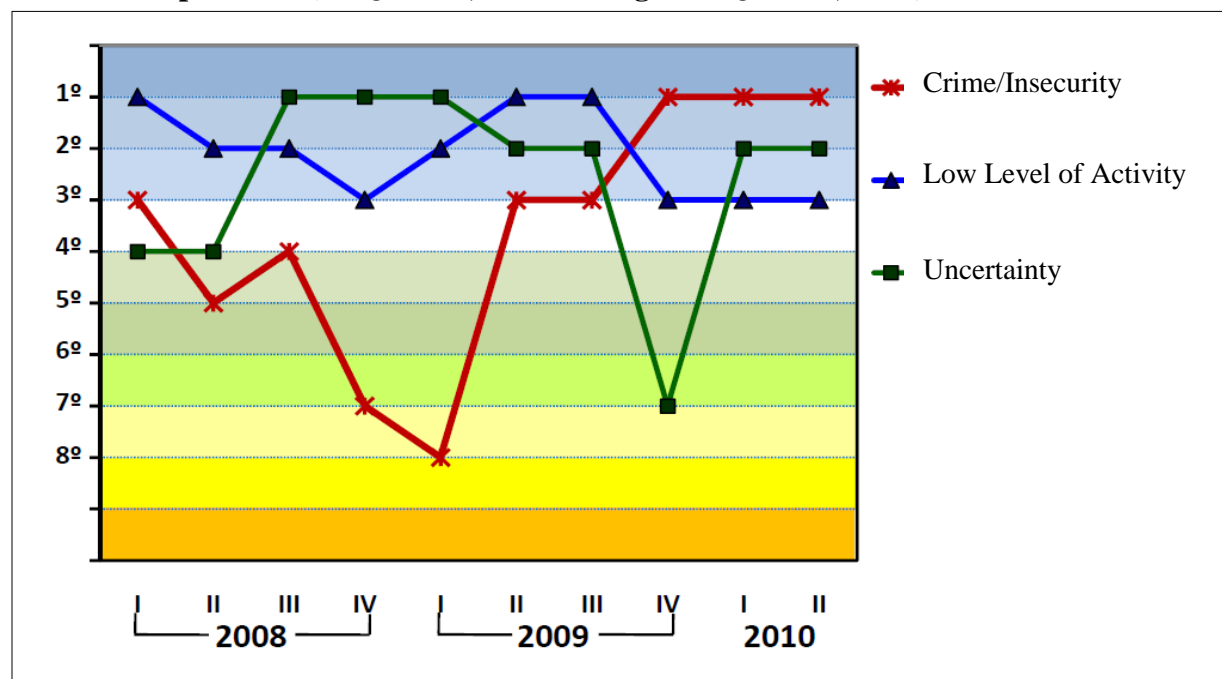
**Figure 5.17: Perceptions of Government Economic Performance in the Americas, 2008 vs. 2010**



Source: LAPOP America's Barometer Survey

This increase may be due to the fact that the FMLN ushered in a more populist strategy of economic management and this survey polls the public and not the private sector more specifically. Thus, this survey result may reflect that the general population is satisfied with the FMLN's economic management, while some in the private sector are less satisfied. In fact, a recent study conducted around the same time by FUSADES, a respected Salvadorian think tank, does demonstrate that the private sector feels differently. Their survey shows that in the past year political uncertainty in the country has moved from the seventh most influential factor contributing to an unfavorable business climate for investors in El Salvador, to the second most influential.

**Figure 5.18: Principal Factors that Influence the Unfavorable Investment Climate, By Order of Importance (1<sup>st</sup> Quarter, 2008 through 2<sup>nd</sup> Quarter, 2010)**



Source: FUSADES, Dynamic Investment Survey

This survey does not show how important the level of uncertainty is relative to the most important factor, or what is causing this uncertainty, but it does provide evidence that seems to contradict the more optimistic picture demonstrated by the LAPOP results.

In conclusion, the evidence regarding the level of political uncertainty in El Salvador and whether or not it could be considered a constraint to economic growth in the country is both imperfect and mixed. Applying the four tests using the current evidence demonstrates the problems with this evidence and suggests that this is not a binding constraint to growth. There is no concrete evidence of any costs of the current political uncertainty, such as investment lost due to uncertainty, so a shadow price cannot be appropriately estimated. Based on information from Polity IV, political uncertainty has consistently fallen over the last 15 years but economic growth has not consistently risen over that time period. Agents in the economy often mention political uncertainty as an important concern, but it is difficult to quantify any measures being taken to overcome uncertainty. Lastly, it is not clear which agents would be less or more intensive in political uncertainty, making it very difficult to consider how that is affecting their growth. As a result, it is not possible to conclude that this is a binding constraint to growth due to lack of evidence; and what evidence does exist does not suggest that this would be a binding constraint.

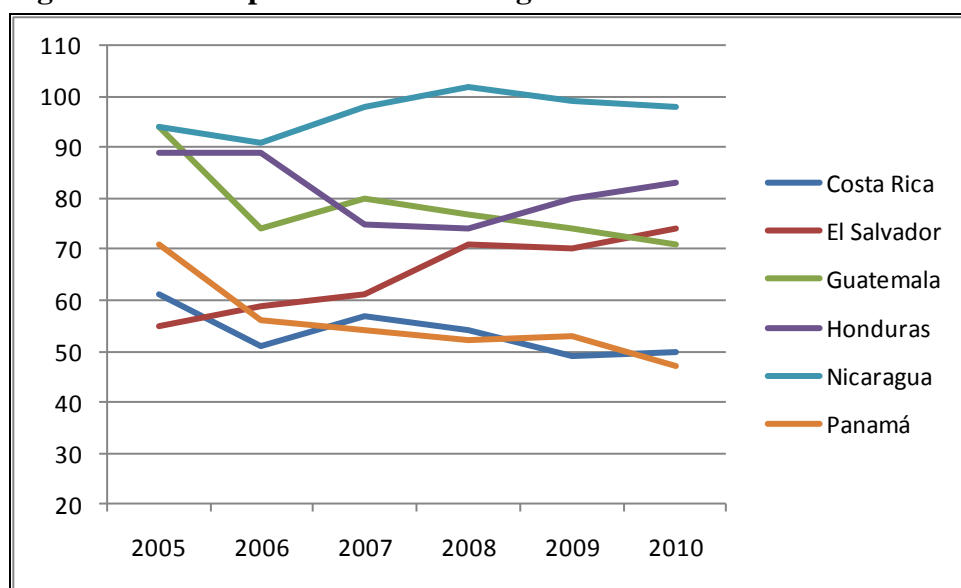
However, there is enough evidence to suggest that at least some important actors within Salvadoran society are deeply concerned about the level of political uncertainty and the potential direction of the Government's management of the economy. Furthermore, most public

pronouncements by the government seem to suggest that the Government wants to work closely and cooperatively with the private sector and does not intend to have a combative relationship. Presumably, private sector actors are mainly concerned with increasing profits and the economic growth that would result from that and will work with a Government that can help them accomplish that goal. If both of the previous statements are true, then it should not cost much in time, effort or resources to diminish the level of political uncertainty in the country. Despite the fact that the level of political uncertainty cannot be determined to be a binding constraint to growth, it may be worthwhile for the U.S. Government, Salvadoran Government and the private sector to work together through a variety of means to address this problem in advance of upcoming elections in 2012 and 2014.

### c. Institutions

The World Economic Forum annually rates the competitiveness of over 100 countries in the world. Over the past five years, El Salvador's position has deteriorated approximately 20 positions to a ranking of 74<sup>th</sup> out of 113 countries (a higher ranking reflects lower competitiveness). The below chart reflects that this deterioration is even somewhat unique in Central America—while El Salvador clearly demonstrates a trend of worsening competitiveness, the rest of Central America has remained relatively steady or has improved over the last five years. As a result of this, El Salvador ranks as the country with the third worst ranking in the region, when it was the best ranked in 2005.

**Figure 5.19: Competitiveness Rankings of Central American countries, 2005-2010**

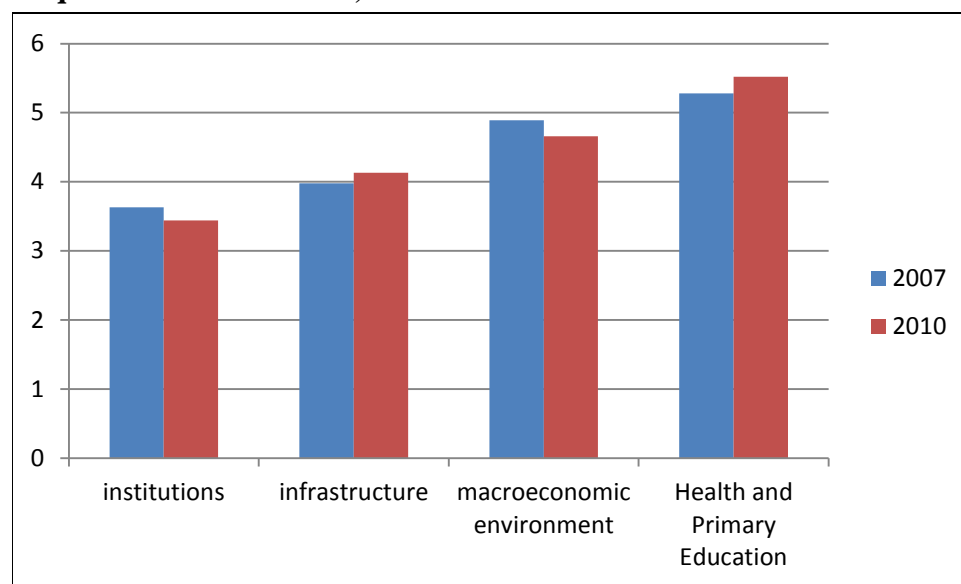


Source: World Economic Forum

After the previous five year period, El Salvador now stands as the third least competitive country in the region, ahead of Honduras and Nicaragua. The circumstances of El Salvador's competitiveness may be negatively impacted by the state of institutions in El Salvador. The

competitiveness ranking is based on measures in three categories: basic requirements (institutions, infrastructure, macroeconomic stability, health and primary education), efficiency and sophistication and innovation. Within the basic requirements category, the component on institutions ranks the lowest, and the measure of institutions has deteriorated since 2007:

**Figure 5.20: El Salvador’s rankings on the Global Competitiveness Report’s Basic Requirements Sub-Index, 2007 and 2010**



*Source: World Economic Forum*

This information suggests quite clearly that El Salvador may have an issue with its institutions, and so we endeavor to study El Salvador’s institutions more thoroughly.

Institutions are sometimes defined as the rules of the game which “structure incentives in human exchange, whether political, social or economic” (North 1990). An institutional structure, when it is lacking, can be a constraint to growth because it fails to provide a clear set of rules that allow transactions to take place. Without a clear set of rules, the costs of conducting a business transaction can become insurmountably high (North 1987). Furthermore, if this framework or set of rules does not exist or does not function properly, then a policy that otherwise would be good, such as privatization, could have negative consequences. Lastly, Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi, the developers of the Worldwide Governance Indicators (WGI) that will provide the organizational structure for this section, define governance, essentially synonymous in this context with institutions, as “the traditions and institutions by which authority in a country is exercised. This includes a) the process by which governments are selected, monitored and replaced; b) the capacity of the government to effectively formulate and implement sound policies; and c) the respect of citizens and the state for the institutions that govern economic and social interactions among them” (Kaufmann, Kraay and Mastruzzi 2010). Regardless of how the concept is defined, providing well-functioning institutions is inherently a



government function, so a study of institutions as a potential constraint to growth falls under the government failures side of low appropriability.

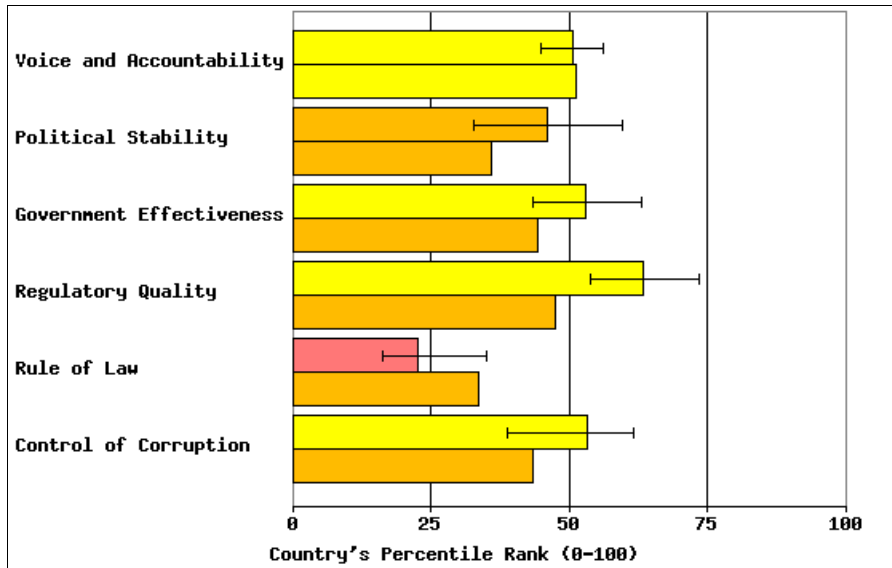
The idea of institutions, even after understanding where it exists within the growth diagnostic methodology, remains a somewhat vague concept. Efforts to measure it have improved recently, but it is still not perfectly clear which are the most important components of institutions or what their impact is on economic growth in the short or long runs (The Economist 2008). In order to truly study it within the methodology, it is necessary to break up the idea into more tangible ideas that can be analyzed using data. Economists have tended to emphasize property rights and the legal institutions that protect those rights as the institutions which need to be focused on, but while those are important they are clearly not the only institutions which merit further investigation.

The WGI provide a good organizing tool to help decide what requires further investigation in the Salvadoran context, although it should be noted that no organizing tool yet exists in the literature that sufficiently disaggregates institutions into truly discrete and complete component parts. As a result, we use the WGI as our introduction to the subject matter, but it does not provide us with a tool upon which to base strong conclusions. In fact, none of the information we can collect in this area provides us with enough detail to conclude whether or not areas in institutions are binding constraints, but the information available does give us a sense of where El Salvador has a weaker institutional structure, and where it is relatively strong. Given the relationship between institutions and a number of other important areas of economic activity, this chapter should prove to be an important contributor to later policymaking within the Partnership for Growth, even if it does not contain conclusions about the constraining effect of El Salvador's institutions.

The WGI rate the quality of institutions in six different areas. These indicators are based on several hundred individual variables measuring perceptions of governance, drawn from 31 separate data sources constructed by 25 different organizations. These individual measures of governance are assigned to categories capturing key dimensions of governance. An unobserved component model is used to construct six aggregate governance indicators. The governance estimates are normally distributed with a mean of zero and a standard deviation of one each year of measurement. This implies that virtually all scores lie between 2.5 and -2.5, with higher scores corresponding to better outcomes. The graphs below show the results for El Salvador, compared to the trends for the whole Latin American Region in two forms. One is the most recent data showing the percentile rank for El Salvador, along with a 90 percent confidence interval, compared with the average percentile rank for the region. The colors reflect potential problem areas and their severity, based on a country or region's percentile rank relative to the rest of the world: a red bar indicates a potentially severe problem (percentile rank below 25 percent), an orange bar indicates a less severe problem but still an issue (percentile rank between 25 and 50 percent), and the yellow bar indicates an area of concern (percentile rank between 50 and 75 percent). The other is time series information showing the change in the indicator scores for El

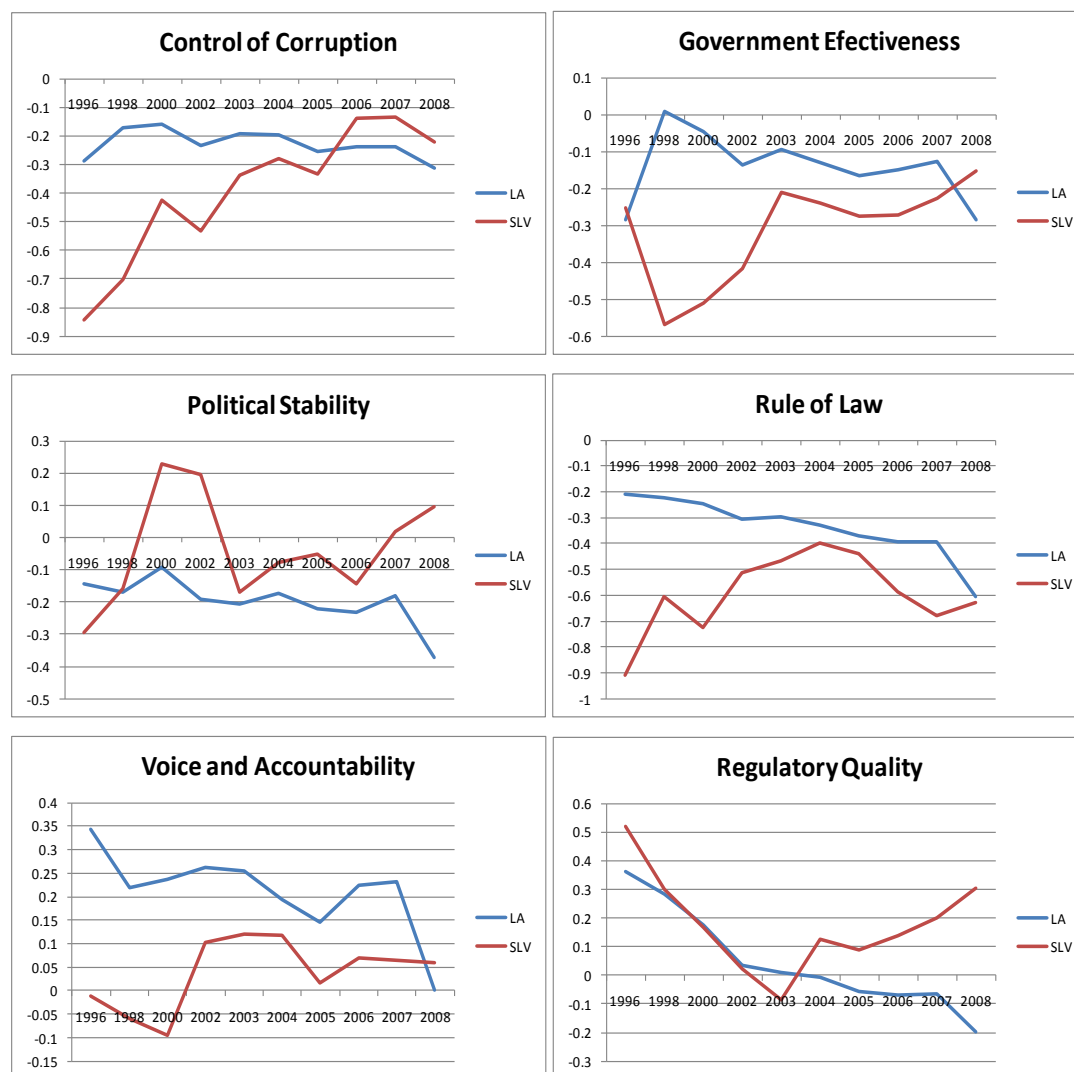
Salvador and Latin America from 1996 to 2008; note that the normalization of the WGI means that cross-year comparisons measure relative not absolute changes. These graphs are presented below:

**Figure 5.21: El Salvador's World Governance Index scores by category, compared to a Latin America average in 2010 (represented by the lower bar)**



Source: (Kaufmann, Kraay and Mastruzzi 2010), World Governance Indicators

**Figure 5.22: El Salvador's World Governance Index scores by category, compared to a Latin America average since 1996**



Source: (Kaufmann, Kraay and Mastruzzi 2010), World Governance Indicators

With a world average of 50 percent in the first graph above, it is clearly visible from the charts that El Salvador is definitively better than the region, at a 90-percent confidence level, and above the world average in the regulatory quality indicator. El Salvador is better than the region, though not at a 90-percent confidence level, and better than the world average in voice and accountability, government effectiveness and control of corruption. El Salvador is better than the region, though not at a 90-percent confidence level, but below the world average in political uncertainty. Lastly, El Salvador is worse than the region, though not at a 90-percent confidence level, and significantly worse than the world average, in the rule of law area. This evidence is not conclusive, but it does give a strong starting point and solid hypothesis that while rule of law, for example, may be a potential problem, regulatory quality seems unlikely to be indicative of a problem. In order to determine this more conclusively, we will disaggregate the information that

contributes to the WGI and other relevant information in each area. We will start first with the area least likely to produce a constraint based on the WGI and end with the most likely.

### *Regulatory Quality*

Regulatory quality, as defined by the World Bank's methodology, refers to the "ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development" (Kaufmann, Kraay and Mastruzzi 2010). "Regulatory Quality" includes measures of the incidence of market-unfriendly policies such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in areas such as foreign trade and business development. According to the World Bank indicator, the regulatory quality has improved significantly since 2003, comparing favorably with the rest of Latin America.

Another measure of regulatory quality is the Fraser Institute – Economic Freedom of the World indicators. This measure has an index that assesses the quality of regulations for credit markets, labor markets and business. The index ranges from 0-10 and measures different indicators such as percentage of deposits held in privately owned banks, foreign bank license denial rate, private sector's share of credit, determination of deposit and lending rates by market forces or the government, impact of minimum wage, use of price controls throughout various sectors of the economy, and ease of starting a new business. El Salvador obtains a score of (6.09), larger than the average in Latin America (5.57) and close to that of advanced countries (6.69). Based on this information, it seems that El Salvador has a good regulatory environment in the areas of finance, trade, and business.

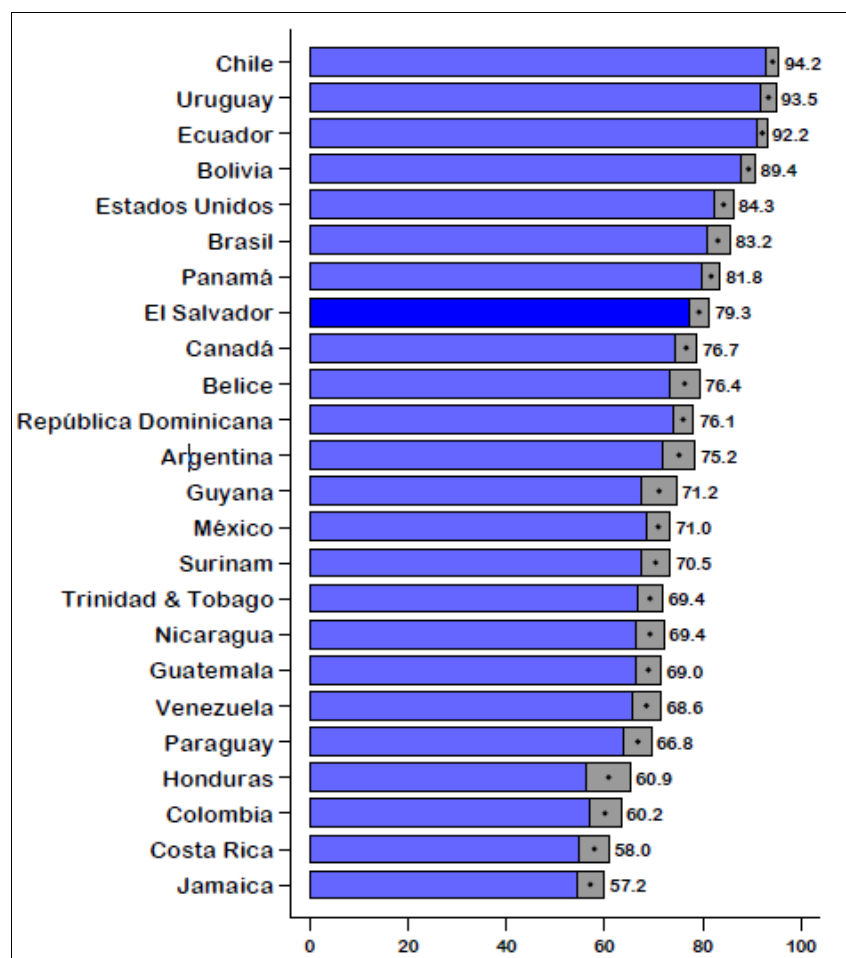
Taking into account the fact that El Salvador performs significantly better than the region in the area of regulatory quality on the WGI, and that the Fraser Institute information does not indicate a problem with the regulatory environment in El Salvador, it seems that regulatory quality, at least in the way it is measured by this indicator, does not present a binding constraint to growth in El Salvador.

It is important to note that these indicators have some limitations, because they are more a measure of non-interference from the government in markets and less a measure of the quality of the government regulatory bodies. In addition, there are other important sectors that contribute to the competitiveness of a country, and institutions in those markets do not perform very well. In particular, regulators in water, electricity and public transport sectors may be performing poorly. Many of these sectors were privatized fairly recently, and in many cases there were fewer efficiency gains than should have been expected. This is likely due, in part, to failures of regulation. These sectors provide great examples of how the issue of regulatory quality needs to be considered not only in terms of how much of it has been removed, but also in terms of the quality and appropriateness of the regulation that exists.

### *Voice and Accountability*

The WGI defines this area as the “extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.” While the WGI shows that El Salvador is at or slightly below the regional average in this category, it also shows that it is above the 50<sup>th</sup> percentile worldwide. The LAPOP America’s barometer survey, which was referred to repeatedly in the political uncertainty section of this constraints analysis, shows that people do not feel too constrained when it comes to their “voice”. As can be seen from the graph below, 79.3 percent of citizens said they voted in the last Presidential election, showing a relatively high level of electoral participation for the region.

**Figure 5.23: Percent of Citizens Who Voted in the Last Presidential Election, Regional Results**



Source: LAPOP America’s Barometer survey (Macias, Cruz and Seligson 2010)

This evidence suggests that Salvadorans feel free to select government in a fair way. Furthermore, potential arguments by which a lack of “voice” would be a constraint to private investment leading to economic growth seem somewhat convoluted. As a result, we accept the initial suggestion by the WGI that this is not a constraint, but further research to verify that may

be merited. Accountability, however, really is a different concept than “voice”, and that issue will be analyzed to some extent in the corruption section presented below.

### *Political Stability*

The WGI measures “Political Stability” by combining several indicators which measure perceptions of the likelihood that the government in power will be destabilized or overthrown by possibly unconstitutional and/or violent means, including domestic violence and terrorism. Political instability presents a major risk of losing investments, so a sound political environment is regarded as beneficial for growth.

According to most international comparisons and indicators, and as discussed in the political uncertainty section of this paper, El Salvador is considered fairly stable in terms of this definition of political stability. As the section on political uncertainty concluded, there is evidence of political instability and concern regarding instability which makes it an important issue to be dealt with, but there is not significant concern of a violent overthrow of government, or of some faction unconstitutionally seizing power. Thus, the particular concern of radical changes in power cannot be considered a constraint to growth in the economy.

### *Corruption*

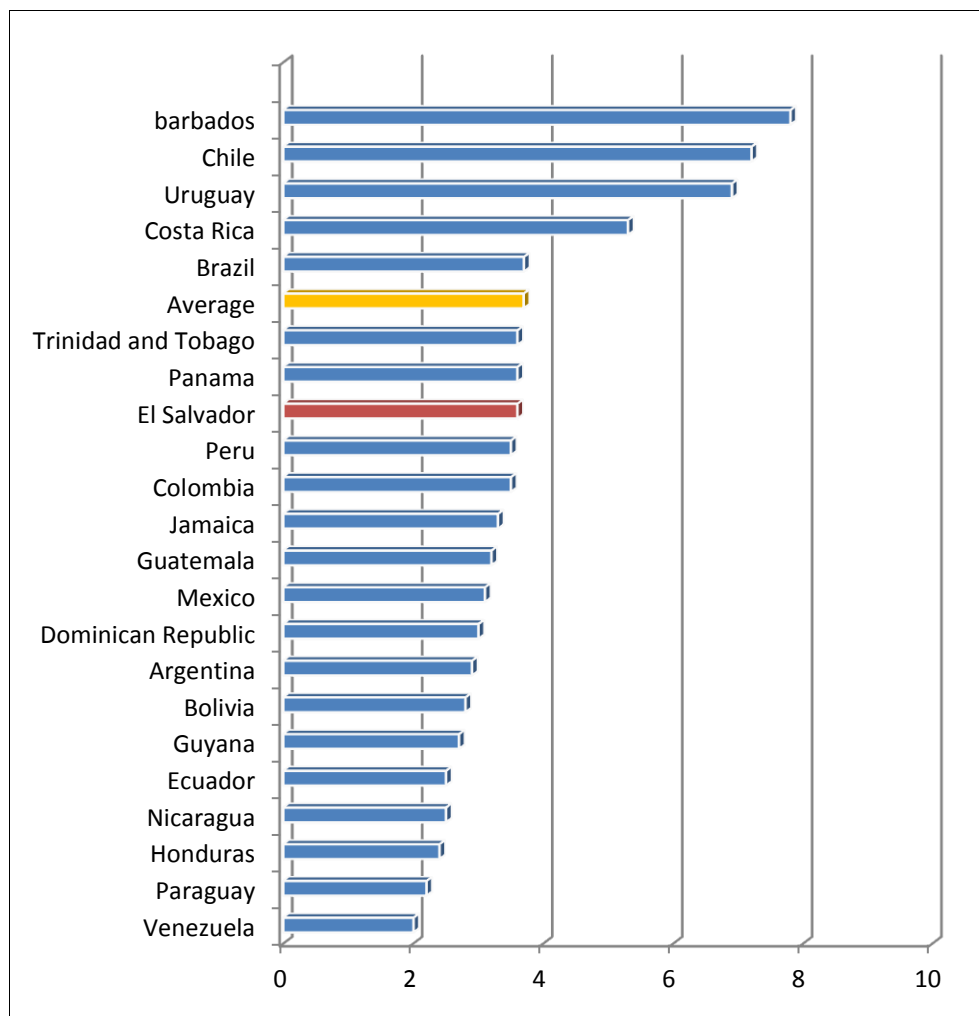
The WGI “Control of Corruption” indicator measures perceptions of corruption, conventionally defined as the exercise of public power for private gain. This phenomenon effectively constitutes a tax and uncertainty around returns, and can deter growth if investors perceive that their returns or risk-aversion-adjusted expected returns are not securely protected. Since institutional accountability essentially refers to the ability to be held responsible for actions done using the public trust, measuring the existence of corruption to a certain degree also measures the absence of accountability.

The evidence of corruption in El Salvador is not clear. The results of World Bank indicators reflect a significant improvement in the control of corruption since 1996. El Salvador had a better outcome on this indicator than the rest of Latin America in 2008, and is currently at a level similar to the rest of the world. However, this contrasts with other surveys and indicators that indicate a high perception of corruption, or at least the presence of a worrying level of corruption. According to Latinobarómetro, in 2008 36 percent of people thought there was more corruption among politicians than before, and only 17 percent thought there was less corruption. To a certain degree, this contradiction can be explained by the fact that the World Bank indicators normalize the results taking into account the average of the world, and therefore a country can improve its position if the world average indicator deteriorates. However, that does not completely explain away this discrepancy.

One of the most cited indicators on corruption is provided by Transparency International. Their Corruption Perception Index compiles survey data and ranks countries in terms of the “degree to

which corruption is perceived to exist among public officials and politicians.”<sup>23</sup> The following table shows the results for Latin America and the Caribbean. El Salvador is below the regional average of approximately 3.7 but above the regional median of 3.3. However, this score is not terribly good at the world level—the index is out of 10, so a score of 3.6 is very low. El Salvador ranks 73<sup>rd</sup> out of 178 countries, which is hardly a stellar performance (though better than the median).

**Figure 5.24: 2010 Corruption Perception Index Scores for El Salvador and other Latin American and Caribbean Countries**

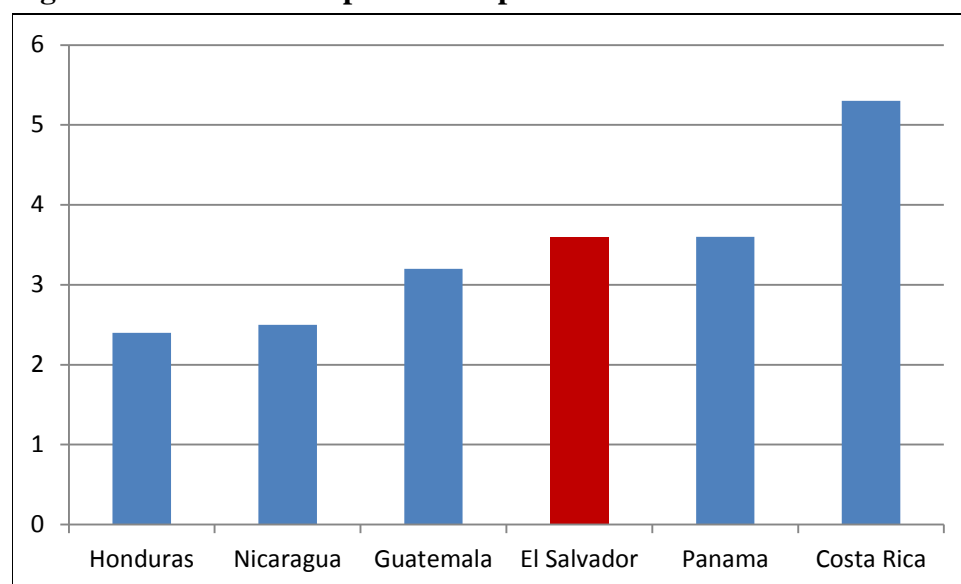


Source: Transparency International, 2010 Corruption Perception Index

Compared to the Central American region, El Salvador ranks third among the six countries and performs almost as well as Panama.

<sup>23</sup> For more information, see the methodological note for the Corruption Perception Index from Transparency International.

**Figure 5.25: 2010 Corruption Perception Index Scores for Central American Countries**



*Source: Transparency International, 2010 Corruption Perception Index*

The evidence from Transparency International does not clearly indicate whether or not corruption in El Salvador is a binding constraint to economic growth. It is apparent that the perception of corruption is still high in El Salvador, but not much worse than in other countries in the region. A more robust conclusion must be based on strong evidence about the extent to which the reality and perception of corruption may be limiting investment in El Salvador.

### *Government Effectiveness*

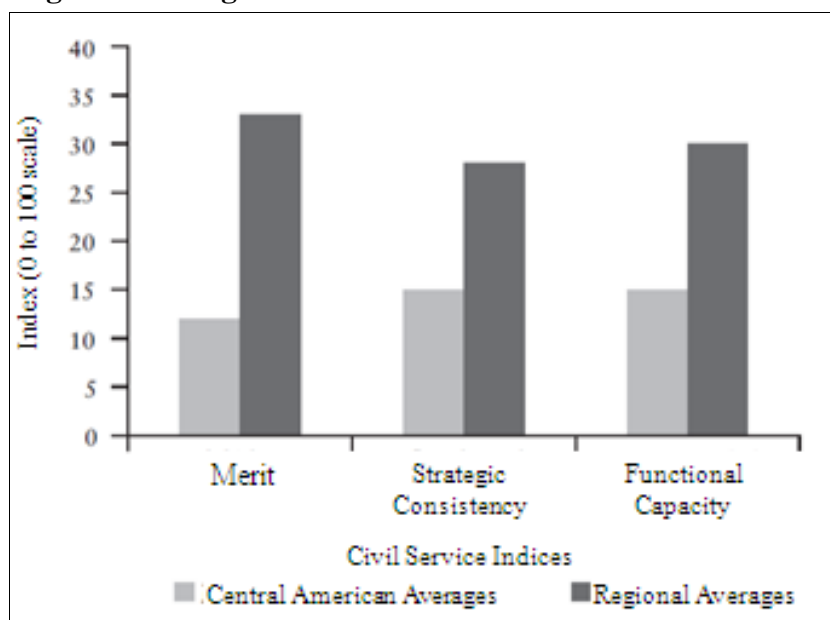
The indicator related to government effectiveness refers to the “quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies” (Kaufmann, Kraay and Mastruzzi 2010). This is pertinent to growth as long as those inputs are crucial for the establishment and well-functioning of markets and the provision of public goods and services. The WGI data shows that El Salvador has shown significant improvement in this area and is currently better rated than the region in this category, almost at a 90 percent confidence level. In addition, percentile rankings indicate that it is probably better than the world average. Nonetheless, anecdotal information from private sector interviews has indicated significant issues in this area which merit further investigation.

Digging deeper into the data reveals that El Salvador’s civil service and public administration are actually very weak, despite the improvements suggested by the WGI. As part of an IDB book entitled “El Estado de las Reformas del Estado en América Latina”, Koldo Echebarría and Juan Carlos Cortázar analyzed civil service quality and effectiveness throughout Latin America. They find that El Salvador’s civil service can be categorized as a clientelistic bureaucracy, characterized by low levels of bureaucratic autonomy and capacity, where politics and not merit



drive personnel decisions (Echebarria and Cortazar 2007). All Central American countries, with the exception of Costa Rica, are rated low in terms of the meritocratic nature, strategic consistency and functional capacity of their bureaucracies.

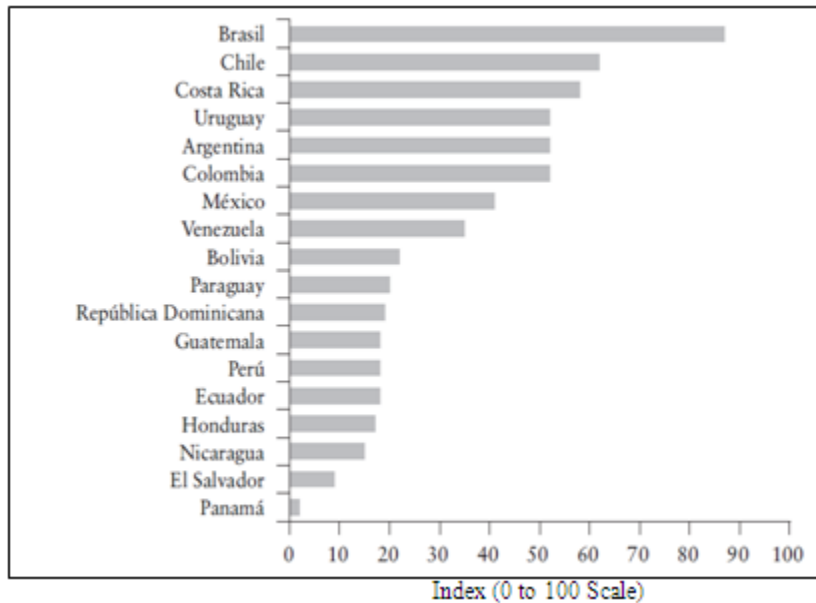
**Figure 5.26: Civil Service Indices, Central American Countries (without Costa Rica) and Regional Averages**



*Source: (Echebarria and Cortazar 2007)*

It is clear from the evidence presented above that Central American bureaucracies are worse than their counterparts from the broader Latin America region. There is further evidence that suggests that El Salvador might be a particularly poor performer among this group, at least in certain areas. In the merit index measured by Echebarría and Cortázar, which measures the effectiveness of employment protections within the civil service and the effectiveness of protection from arbitrary, politicized rent-seeking decision making within the civil service, El Salvador ranks second to last in Latin America, ahead of only Panama.

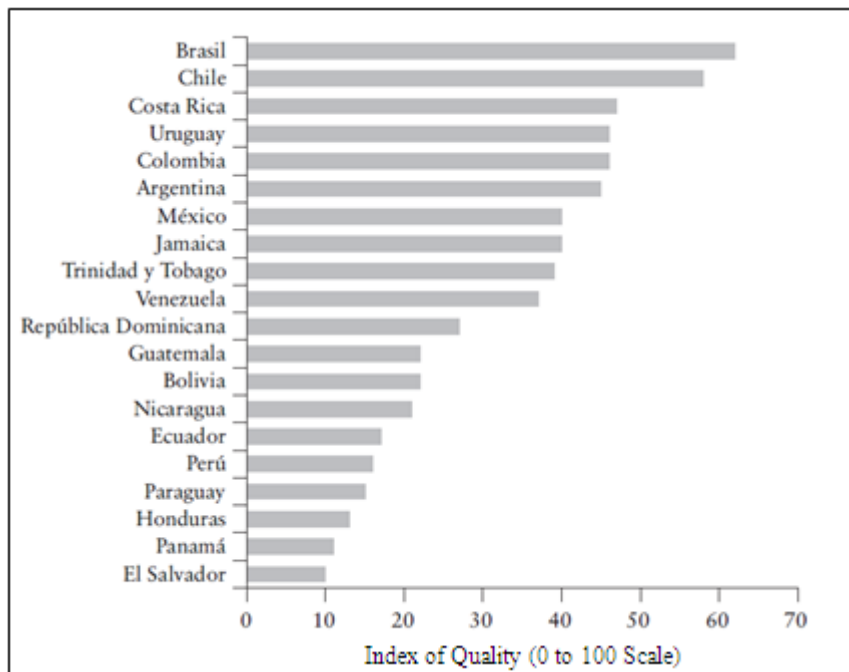
**Figure 5.27: Merit Index**



Source: (Echebarria and Cortazar 2007)

The same study ranks El Salvador as the country with the lowest quality of civil service, based on a composite score of El Salvador's measures of efficiency, merit, structural consistency, functional capacity and integrated capacity within the civil service.

**Figure 5.28: Quality of Public Administration**



Source: (Echebarria and Cortazar 2007)

Perhaps in part as a result of these public administration challenges, El Salvador has been unable to fully spend its budget in recent years. The level of budget execution, which is the amount of

allocated budget that gets used in a given year, was only 63.7 percent and 68 percent in 2009 and 2010, respectively. This suggests that El Salvador is structurally weak in its ability to carry out its plans.

The information provided by the IADB and the statistics regarding budget execution and informality suggest the need for further investigation. The IADB also contributes their information to a database called DataGov which tracks a broad set of indicators on a number of governance-related issues. In the area of public management, El Salvador rates significantly below regional averages—greater than 50 percent below the averages—in the meritocratic practices of the civil service, capacities of external oversight institutions, efficiency in the civil service, leadership consistency in the civil service, quality of information and statistics in general, and structural consistency in the civil service. Furthermore, El Salvador rates greater than 40 percent below regional averages in the competence of civil servants, the efficacy of incentives in the civil service and the functional capacity in the civil service.<sup>24</sup>

While bureaucratic inefficiency is a problem for the government wherever it is found, for the purposes of this investigation into the constraints to economic growth and private sector investment, we are most interested in problems which arise as the public administration interacts with commerce. In a 2009 survey by PROESA, the government's export promotion agency, concluded that the government, in terms of inefficiency of bureaucracy and inconsistency of judicial decisions, constituted one of three major obstacles to doing business in El Salvador (PROESA 2009). Moreover, the informality section of this report also indicates problems with institutions and shows that businesses in El Salvador choose informality at a higher rate than the Latin American average, which is already high when compared to the world. This suggests that the services provided by El Salvador's bureaucracy are poor, even relative to other Latin American countries, resulting in businesses risking the uncertainties of operating informally at a higher rate than in other locations in Latin America. Though these two examples of the PROESA survey and the high level of informality are not exhaustive they are perhaps indicative that El Salvador's challenges with public administration may touch on economic growth in significant ways.

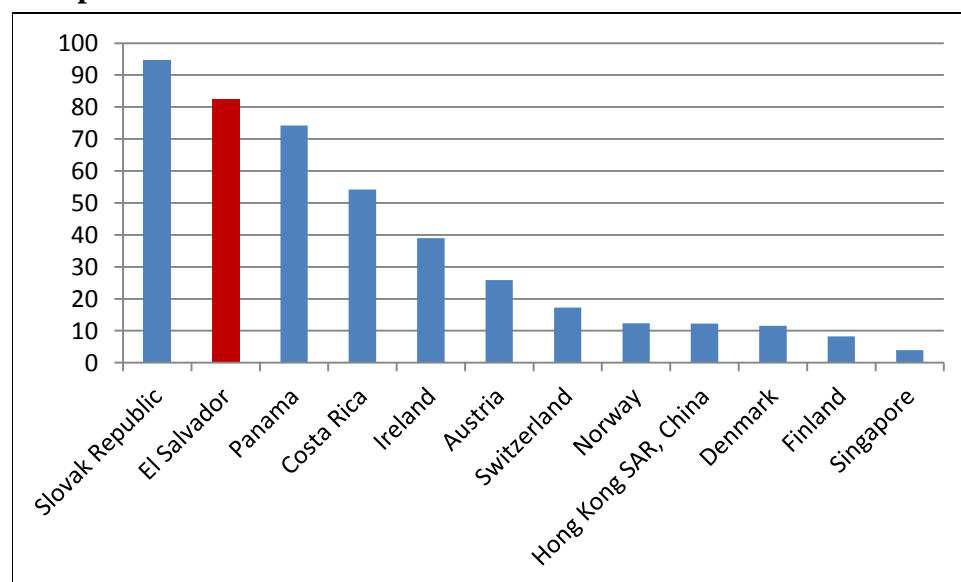
The evidence strongly suggests that there is a serious problem with the civil service bureaucracy in El Salvador. We cannot truly conclude that this is a binding constraint because the measurements of a shadow price and efforts by the private sector to operate around the constraint would be too inaccurate to defend, so we do not make an attempt to conclude whether El Salvador's government effectiveness presents a binding constraint or not. However, the evidence does point to a serious problem that likely contributes to other important issues in this report. It is likely that El Salvador needs to substantially improve the performance of its civil service bureaucracy to achieve sustained higher levels of economic growth. One indication of this is the difference in basic measurements of bureaucratic quality between El Salvador and

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<sup>24</sup> Calculations made based on the information here: <http://www.iadb.org/datagob/index.html>

some of the other successful, small open economies that El Salvador most likely must emulate. Subtracting the crime-related indices from the institutions “pillar” of the Global Competitiveness Index<sup>25</sup> and then taking an average of the remaining indices which measure such things as the favoritism in decisions of government officials and the wastefulness of government spending, gives a relatively good, quick metric of bureaucratic quality. As can be seen below, El Salvador does not compare well with a set of countries with similar populations and land restrictions:

**Figure 5.29: Country Averages on select Institutions “Pillar” indicators of the Global Competitiveness Index**



Source: World Economic Forum Global Competitiveness Index 2010

With the Global Competitiveness Index, higher scores represent poorer performance. Among this group of countries with similar population profiles, El Salvador only performs better than the Slovak Republic. Again, while this information cannot be relied on to draw a conclusion regarding the binding nature of this aspect of institutions, it is indicative of a problem. For purposes of economic growth, if the country wishes to resolve some of the issues of bureaucratic quality highlighted here, it is advisable to begin by examining those institutions that have direct interaction with businesses and investment.

### *Rule of Law*

The WGI measures what they consider “Rule of Law” by measuring “which agents confide in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.” The component parts of rule of law measures perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts. Together, these indicators

<sup>25</sup> Given El Salvador’s crime situation, including the crime indicators would drastically skew the data and misrepresent the situation. Removing the crime indicators gives us some sense of how bureaucratic problems are affecting economic competitiveness absent the crime situation.

measure the success of a society in developing an environment in which fair and predictable rules form the basis for economic and social interactions and the extent to which property rights are protected.

The indicator for rule of law is especially relevant for economic growth. As Hausman and Rodrik argue (Hausman 2004), a poor definition and protection of property rights can limit productive investments if investors think that they cannot appropriate the returns on their investments because their claims are not well-defined or are poorly protected as could result from corruption, judicial manipulation or crime. As discussed in the previous section on Government Effectiveness, the 2009 PROESA survey indicated that inconsistency of judicial decisions is one of the major obstacles to doing business as identified by Salvadoran firms (PROESA 2009).

Evidence suggests that inadequate protection of property rights could be limiting growth in El Salvador. For example, the Economic Freedom index of the Fraser Institute rates the legal structure and protection of property rights, which takes into consideration judicial independence, impartial courts, intellectual property protection, military interference in the rule of law and legal system integrity, as being at the average of Latin America, but considerably below the level of developed countries.

El Salvador receives an overall rank of 101 of the 139 countries evaluated in the Global Competitiveness Indicators' pillar of Institutions.

| Institutions Sub-Indicator                                    | World     | LAC | CA  | El Salvador |
|---|-----------|-----|-----|-------------|
| 1.01 Property Rights  | 4.4       | 3.9 | 4.0 | 4.1         |
| 1.02 Intellectual Property Protection                         | 3.7       | 3.1 | 3.1 | 2.9         |
| 1.05 Irregular Payments and Bribes                            | 4.3       | 3.9 | 3.7 | 3.9         |
| 1.06 Judicial Independence                                    | 4.0       | 3.4 | 3.1 | 3.0         |
| 1.07 Favoritism in Decisions of Government Officials          | 3.3       | 2.7 | 2.7 | 2.6         |
| 1.08 Wastefulness of Government Spending                      | 3.4       | 2.8 | 2.9 | 3.3         |
| 1.09 Burden of Government Regulation                          | 3.3       | 3.1 | 3.4 | 3.4         |
| 1.10 Efficiency of Legal Framework in Settling Disputes       | 3.8       | 3.3 | 3.2 | 3.1         |
| 1.11 Efficiency of Legal Framework in Challenging Regulations | 3.7       | 3.2 | 3.2 | 3.0         |
| 1.12 Transparency of Government Policymaking                  | 4.4       | 4.2 | 4.3 | 4.2         |
| 1.14 Business Costs of Crime and Violence                     | 4.8       | 3.3 | 2.9 | 1.8         |
| 1.15 Organized Crime  | 5.2       | 4.0 | 3.4 | 2.2         |
| 1.19 Efficacy of Coporate Boards                              | 4.6       | 4.5 | 4.6 | 5.0         |
| 1.20 Protection of Minority Shareholders' Interests           | 4.3       | 4.1 | 4.0 | 3.8         |
| 1.21 Strength of Investor Protection                          | n/a       | 5.1 | 4.3 | 4.3         |
| Overall Rank Institutions Pillar                              | 101 / 139 |     |     | 3.4         |
| Source: Global Competitiveness Index 2010                     |           |     |     |             |

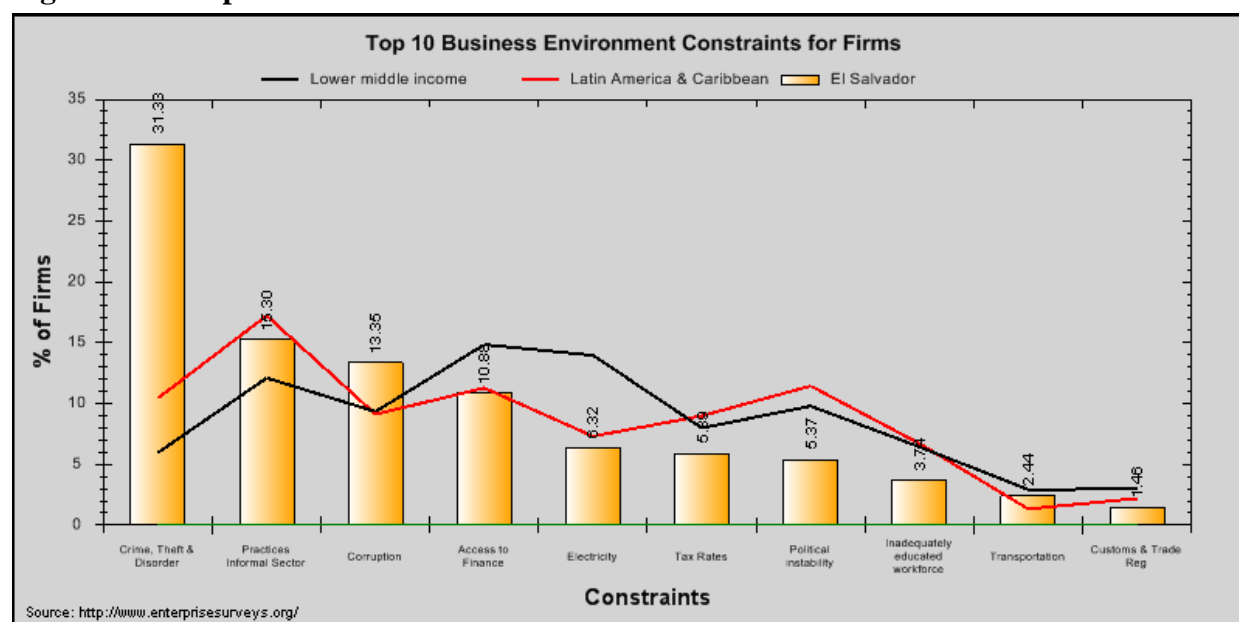
Ultimately, the rule of law measurements certainly suggest a problem and a potential binding constraint, but it is necessary to disaggregate this from the problem of crime. There are definite interaction effects where the level of crime contributes significantly to the problems of rule of law, both in reality and in the metrics used to measure the rule of law. Conversely, there seem to be some problems with the justice system that contribute to the crime issue. In the end, the rule of law is not determined to be a binding constraint on its own, but only because the aspects of this area that appear potentially binding are so intertwined with the crime and security situation in El Salvador that it should be considered as a critical component part of it. More research on the quality of the justice system—both as it relates to economic functions and as it relates to the circumstances of crime and violence—is certainly merited and necessary.

#### **d. Informality**

The informal economy, which can be defined broadly as “those economic activities and the income derived from them that circumvent or otherwise avoid government regulation, taxation or observation” (Del'Anno 2003), (Del'Anno and Schneider 2005), (Feige 1989), is located within the growth diagnostic tree under the government failures side of the low appropriability branch. The informal sector could be an obstacle to growth if companies that are escaping government regulation or taxation are outcompeting formal sector businesses, and causing future businesses to not invest or to operate informally. If this is an obstacle, it would be an indication that government is failing to enforce its business regulations and eroding the competitive structure for businesses that do operate formally. It should be noted here that this section investigates specifically if the existence of an informal sector is a binding constraint to growth for the formal sector, not if there are binding constraints to growth for those in the informal sector. It is quite likely, as will be discussed here, that the existence of a large informal sector in El Salvador is symptomatic of other problems in the economy and that significant gains in productivity and economic growth could be achieved if a proper avenue were established that would allow informal actors to pursue their businesses through formal economic means.

Due to the fact that informal businesses are, by definition, attempting to escape detection, we have very little concrete evidence on the effect of informality on economic growth in El Salvador. The reason this merits treatment within this study is the concern some private sector businesses have expressed about the impact of informality on the Salvadoran economy. For example, the practices of the informal sector emerged as the second issue most mentioned as a primary constraint in El Salvador in the 2006 World Bank Enterprise Survey, as shown below.

**Figure 5.30: Top 10 Business Environment Constraints**



Source: World Bank Enterprise Survey, 2006

The percentage of firms mentioning the informal sector as a constraint in El Salvador was below the Latin American average, but above the average for Lower Middle Income countries. Due to the complexity of this topic, the difficulty of studying it, and the limited time and resources available, there is not sufficient evidence to conclude that this is an obstacle to economic growth, but it is a topic worthy of deeper investigation.

There are two sides of informality worth studying. One side is the effects on growth of the informal economy on the formal economy, which will be discussed here from a more theoretical perspective. The other side is the underlying reason for the size of the informal economy, which we will attempt to examine briefly as well.

On how the informal economy affects the formal economy, there are three main perspectives regarding. The first is that the informal economy is comprised of businesses that would be formal businesses and would add a significant amount of investment capital to the formal economy if onerous regulations and payments required for them to become formal businesses were removed (De Soto 1989), (De Soto 2000). The second perspective is that the informal sector unfairly competes with the formal economy because they do not pay taxes and are not subject to regulations. Furthermore, they free-ride and receive public infrastructure and basic public services without paying for them, therefore eroding the quality for paying recipients (Dell'Anno 2007), (Enste 2003). The third perspective is that the informal and formal economies are “dual economies” which do not directly compete in significant ways due to very different levels of productivity (La Porta and Shleifer 2008). In this case, the informal economy and formal economy do not affect each other significantly and, if anything, the informal economy bolsters the formal economy by spending their earnings on goods produced by the formal

economy, and employing labor during formal economy downturns (Schneider and Enste, *Shadow Economies: Size, Causes, and Consequences* 2000).

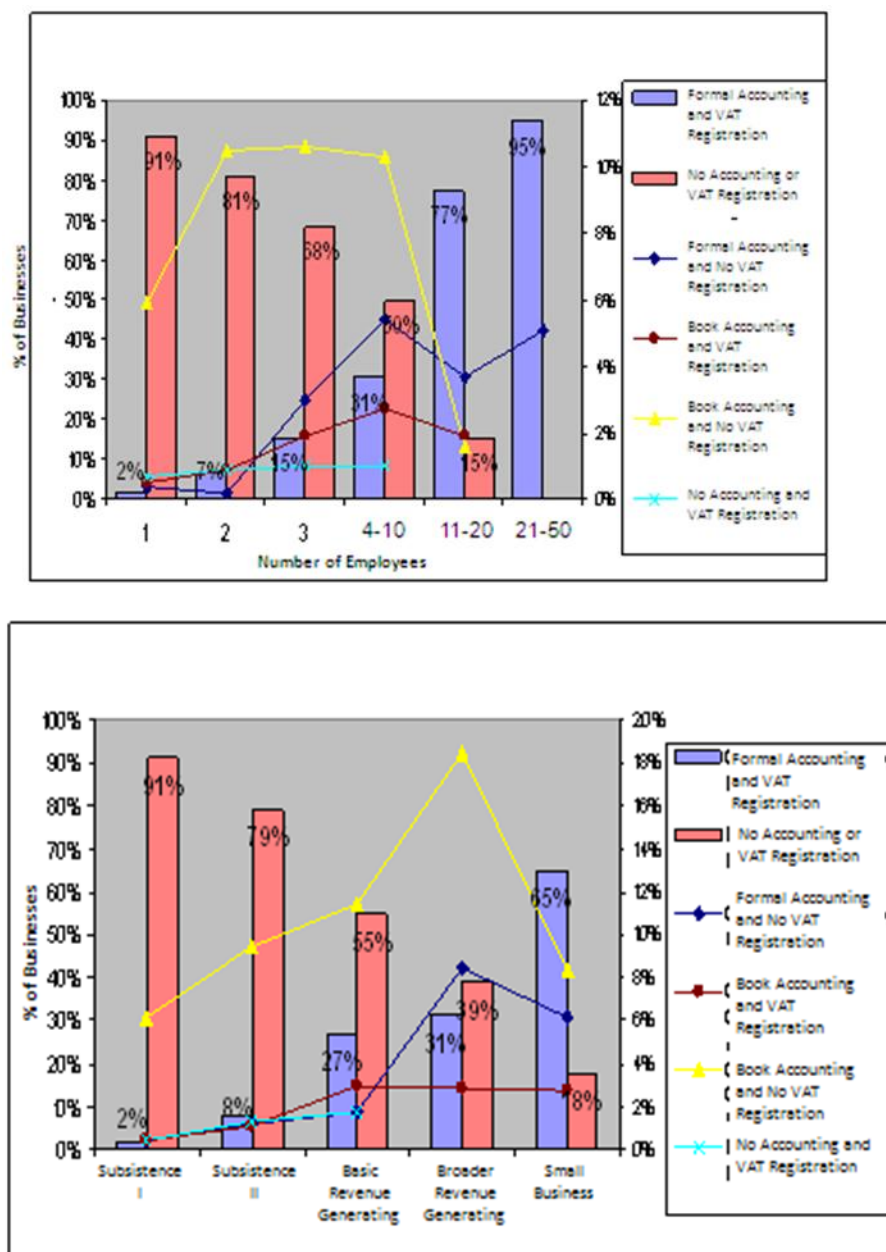
Many of the recent economic models on informality conclude that the “dual economy” model is the best perspective for interpreting the effect of the informal economy on the formal economy. La Porta and Shleifer (2008) conclude that there is a “dual economy” relationship between the informal economy and the formal economy, due to the differences in productivity levels. Furthermore, they find that there is not much interaction between the two: few formal firms operated at any time informally, and few informal firms convert to becoming formal. Dell’Anno (2008) studies informal economies in Latin America and concludes that there is an interaction, but it is positive and complementary, meaning that the informal economy supports and strengthens the formal economy and vice versa. Russo (2008) concludes, similarly to La Porta and Shleifer (2008), that the informal and formal sectors do show important differences in productivity and so they do not experience a great deal of interaction, but he goes further in saying that the reason for these differences in productivity might stem from the differences in services available to legal formal economy actors versus informal economy actors (Russo 2008). Schneider (2008) does not conclude anything about the relationship between the informal and formal economies. However, he does show that the informal economy and corruption are complements in developing countries because informal actors in developing countries rely on illegal payments for services to continue operating informally, which in turn reinforces corrupt behavior by government officials who are rewarded for providing services illegally and not enforcing laws that apply to informal businesses. Based on these models, one conclusion regarding the relationship between the informal and formal economies would be that they do not interact significantly, and therefore it would be difficult for the informal economy to be a binding constraint to growth in the formal economy of El Salvador.

Before concluding that the informal economy is not a binding constraint to growth in El Salvador, it is important to see if the available information regarding El Salvador’s informal sector supports the more theoretical conclusion expressed above. As was mentioned earlier, studying the informal economy is difficult due to the fact that it consists of actors that do not want to be found and what information is available is limited. The clearest conclusion from the available information is that this subject requires further study, but we can make some inferences from the evidence. CONAMYPE wrote about the informal sector in their 2004 annual report. In that, they find evidence that shows a relationship between the size of a small business—measured by the number of workers—and the degree of informality of that business. They show a similar relationship between the type of business—graded as “subsistence firms” up to “small



businesses”—and the degree of informality of that business.<sup>26</sup> The graphs showing these relationships are shown below:

**Figure 5.31: Degree of Informality by Type and Size of Business**



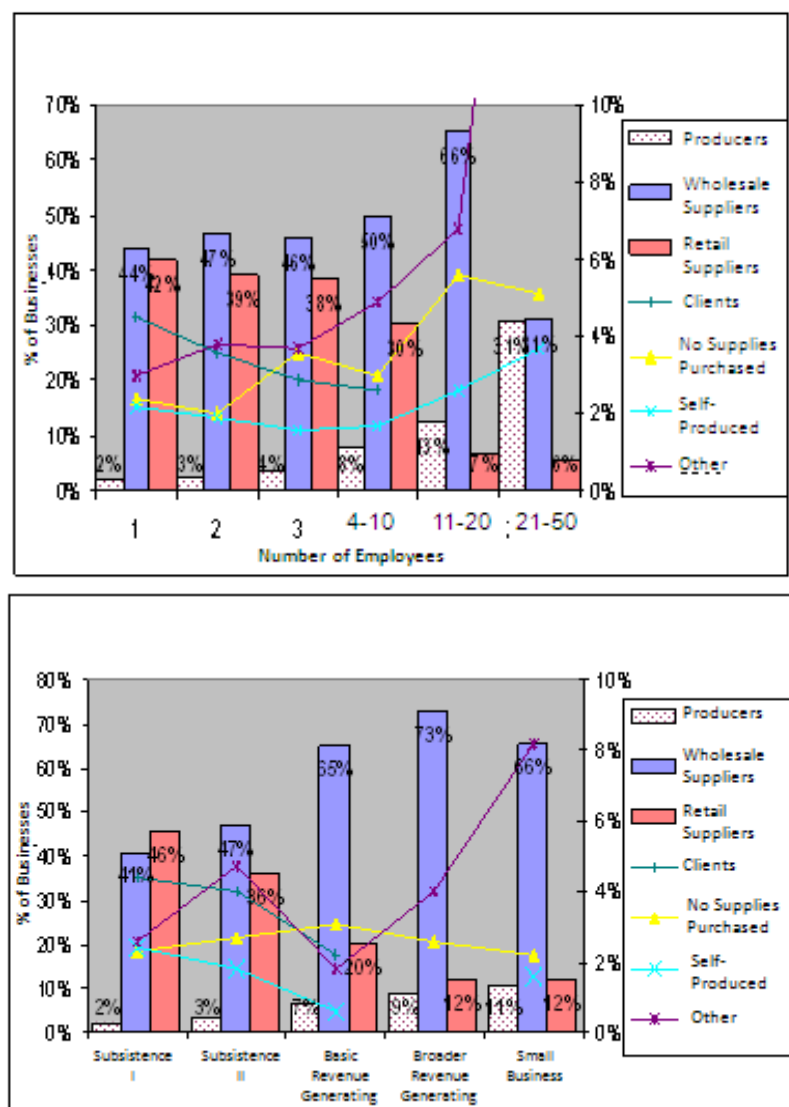
Source: (CONAMYPE 2005)

This would provide evidence that El Salvador fits the pattern of conclusions mentioned above, namely that informal businesses are less productive and may not compete with the formal

<sup>26</sup> The categories of businesses from Subsistence I to Broader Revenue Generating all refer to classifications of microenterprises. Using CONAMYPE definitions, Subsistence firms generate monthly sales equivalent to 11.9 minimum-wage salaries, Basic Revenue Generating firms generate monthly sales equivalent to 23.8 minimum-wage salaries, and Broader Revenue Generating firms generate monthly sales equivalent to 39.7 minimum-wage salaries.

economy, if these businesses are in fact less productive. There is suggestive—although not conclusive—information showing that these small and less complex types of businesses are also less productive. First of all, these businesses get more of their supplies from retail providers, meaning that they have less sophisticated supply chains:

**Figure 5.32: Principal Providers of Inputs, by Type and Size of Business**

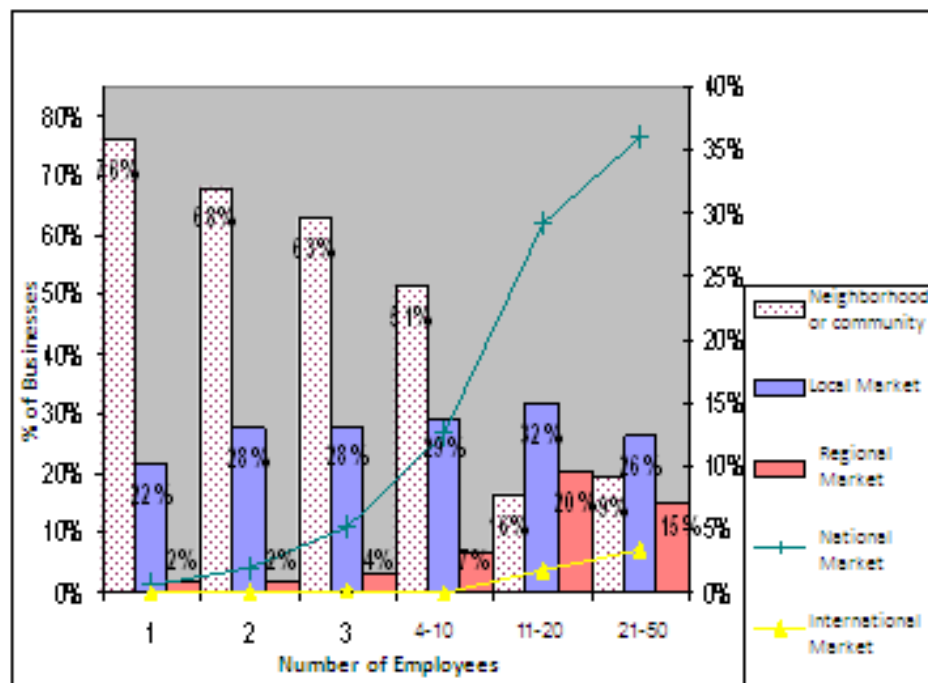


Source: (CONAMYPE 2005)

The level of supply-chain sophistication can be a proxy for the productivity of a business, indicating that these businesses are less productive. Further evidence that these businesses are less sophisticated is the reach of their business, or the distance of their clients from the point of production or sale. As Rodrik (2008) argues, it takes a more sophisticated and potentially productive business to export (Rodrik 2008). Extrapolating that argument to a natural conclusion, it likely takes a more productive or sophisticated firm to operate in the next closest region, city or town. The least sophisticated and productive firms would likely depend largely

on markets very near to their immediate surroundings. Indeed, the majority of small and less complex businesses rely on their immediate surroundings for their revenue, as CONAMYPE shows:

**Figure 5.33: Principal Client by Size of Business**



Source: (CONAMYPE 2005)

Although this evidence is not conclusive, it does strongly suggest that the smaller and less complex businesses in El Salvador, which were also shown to be the more informal, are significantly less productive than their larger, more formal counterparts. Based on the scant available evidence, El Salvador therefore fits the theoretical argument, in which the informal economy is less productive and not competing with the formal economy.

Attempting to apply the four tests to this issue proves extremely difficult. Formal economy actors do not appear to pay any discernable shadow price for the existence of the informal economy. One possibility would be to estimate the losses in economic growth caused by the lost fiscal resources that the government does not obtain due to the number of informal companies. It is impossible to calculate if movements in the number of informal businesses affected growth in the formal economy, because measurements of the number of informal businesses are imprecise and scarce. It is also extremely difficult to determine what effort anyone is taking to overcome the constraint the informal economy might present. Lastly, determining who is more or less intensive in a potential informal sector constraint would require a large amount of time and effort, and no such evidence exists to date. Anecdotally, it is possible to find examples where the magnitude of the informal sector was such that it replaced the formal sector, such as with the video rental industry in El Salvador.

In conclusion, the evidence that does exist suggests, albeit inconclusively, that the informal economy does not present a constraint to formal economic growth in El Salvador, but instead operates in a separate or “dual” economy. However, this conclusion is based on a limited amount of evidence in a subject area that is extremely difficult to study, making it impossible to support this conclusion with any strength. It is quite possible that the informal sector competes with the formal sector in some very important ways, but in the aggregate that competition does not constrain economic growth in the formal sector. It is also quite possible, if not likely, that informal economy actors’ not participating in the formal economy results in lost productivity and lost economic growth for a country. In fact, that is central to Hernando De Soto’s argument and supported by a recent study by the IDB on productivity (De Soto 2000) (Pagés 2010). Given the interest in this subject and the size of El Salvador’s informal economy—48.3 percent in 2003, 5 percent higher than the average for Latin America—this merits significant attention in the future to truly decipher the effects of the informal economy on the formal economy and potential economic growth through various channels (Schneider, Buehn and Montenegro 2007).

A final point to emphasize is that the existence of a sizeable informal economy is an indirect indicator of problems with government institutions. As mentioned earlier, El Salvador’s estimated informal sector was 48.3 percent in 2003, which was 5 percent higher than the average for Latin America. The average for Latin America was 13 percent higher than the average for Asia and 27 percent higher than that for OECD countries (Buehn and Schneider 2007). This means that El Salvador’s informal economy is larger than average for a region with a large informal economy. Russo (2008) finds that while the informal economy and formal economy do not compete, the main reason behind this is that informal firms cannot overcome the high barriers to entry presented by inefficient or expensive bureaucracies that must be confronted in order to formalize. Based on this evidence, one could infer that the presence of a large informal sector like El Salvador’s is indicative of problems in the institutional structure of the country, and there might be a great deal to gain in economic growth and productivity by removing these institutional barriers.

#### **e. Macroeconomic Instability**

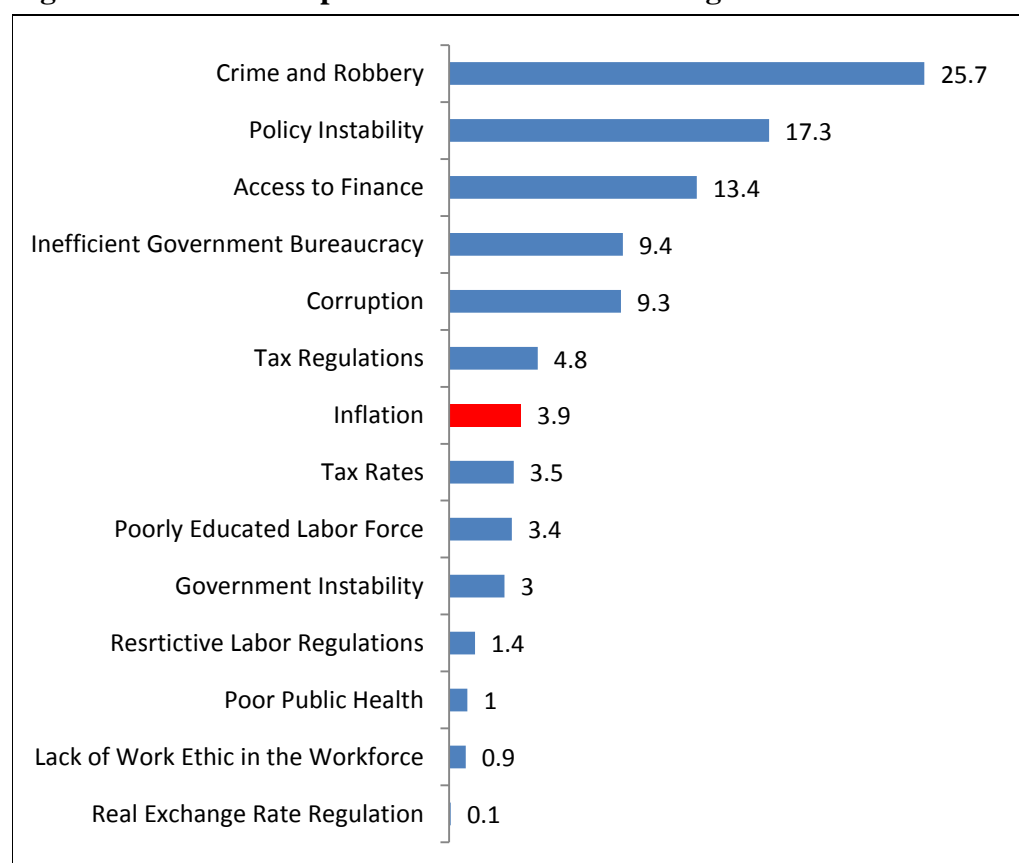
An unstable or uncertain macroeconomic environment can restrict growth for several reasons, including, but not limited to:

- Excessive price volatility, making earning potential less predictable and discouraging investment; or,
- A fragile fiscal situation limiting the government’s capacity to carry out counter-cyclical policies, and making it difficult for the government to provide efficient resources.

Based on the evidence on hand, macroeconomic instability is not a binding constraint to growth. This conclusion does not mean, however, that El Salvador will not face this constraint in the future, particularly if it becomes difficult to meet fiscal goals.

Among Latin American countries, El Salvador has traditionally enjoyed relative price stability. Out of 139 countries assessed by the World Economic Forum in its Global Competitiveness Index 2010/2011, El Salvador was ranked 27<sup>th</sup> on the rate of inflation and 45<sup>th</sup> on interest rates. These indicators show that El Salvador's price stability is a prominent competitive advantage.<sup>27</sup> As figure 5.33 below shows, inflation is not considered a problematic factor for doing business in El Salvador.

**Figure 5.34: The most problematic factors for doing business in El Salvador<sup>28</sup>**



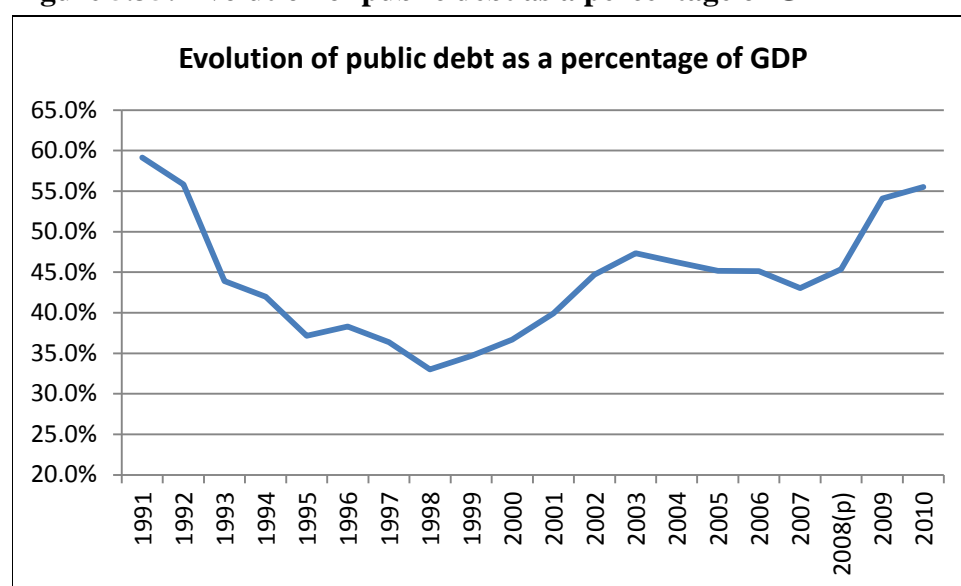
Source: *Global Competitiveness Report 2010/2011*

El Salvador is not in as favorable a fiscal position. El Salvador ranks 75<sup>th</sup> out of 139 countries in government debt, and levels of public debt are currently at levels comparable to the high levels of 1993.

<sup>27</sup>Under the World Economic Forum's indicators, for indicator purposes the countries are placed in a descending order in terms of competitiveness

<sup>28</sup> Interviewees were asked to select 5 out of a list of 15 factors, which they considered more problematic and order them between 1 (more problematic) and 5. The bars on the chart show the weighted responses according to their ranking.

**Figure 5.35: Evolution of public debt as a percentage of GDP**



Source: Salvadoran Central Bank (BCR)

Nevertheless, the increase in government debt has not yet resulted in greater cost of financing for the country, as evident during the last placement of sovereign bonds in the international market (see the analysis of costly financing in this document).

It is therefore possible to reason that although the fiscal situation is not currently a constraint, and has not contributed to a greater degree of difficulty to access government financing, should there be greater fiscal impairment, this could constrain the economy, in case the country has problems financing its deficit.

The following tables show the projections contained in the Stand-By Agreement with the IMF. According to these projections, in order for the national debt to decrease to 47.7 percent of GDP by 2015, the country needs to generate a budget surplus<sup>29</sup> starting in 2012. This implies that fiscal revenues must increase by nearly two percentage points of GDP between 2010 and 2012. Reaching these goals could become complicated if the country does not reach a fiscal pact that, for example, might include raising taxes.

<sup>29</sup> The primary surplus is calculated as total income minus non-interest expenses

**Table 5.36: Macroeconomic Framework Projections from the IMF Standby Agreement (percent of GDP, unless otherwise noted)**

|   | 2009  | Projections |       |       |       |       |       |
|---|-------|-------------|-------|-------|-------|-------|-------|
|   |       | 2010        | 2011  | 2012  | 2013  | 2014  | 2015  |
| Real GDP growth (percent)                   | -3.5  | 1.0         | 2.5   | 3.0   | 4.0   | 4.0   | 4.0   |
| Inflation (percent, end of period)          | 0.0   | 1.5         | 2.8   | 2.8   | 2.8   | 2.8   | 2.8   |
| Contributions to growth (percentage points) |       |             |       |       |       |       |       |
| Domestic demand                             | -12.8 | 3.2         | 4.0   | 3.6   | 4.9   | 5.1   | 4.9   |
| Net exports                                 | 9.2   | -2.3        | -1.5  | -0.6  | -0.9  | -1.1  | -0.9  |
| Nonfinancial public sector balance          | -5.6  | -4.8        | -3.5  | -2.5  | -2.0  | -1.8  | -1.5  |
| Primary balance                             | -3.0  | -2.4        | -0.4  | 0.4   | 1.0   | 1.1   | 1.3   |
| Public sector gross debt                    | 49.5  | 51.2        | 52.1  | 51.8  | 50.6  | 49.1  | 47.7  |
| External current account balance            | -1.8  | -2.8        | -3.1  | -3.2  | -3.2  | -3.3  | -3.3  |
| Trade balance                               | -13.5 | -15.1       | -15.5 | -15.4 | -15.4 | -15.4 | -15.3 |
| Workers' remittances receipts               | 16.4  | 16.7        | 17.0  | 17.2  | 17.2  | 17.2  | 17.2  |
| Gross domestic investment                   | 13.1  | 12.8        | 13.3  | 13.8  | 14.2  | 14.5  | 14.8  |
| Private                                     | 10.6  | 10.2        | 10.4  | 10.9  | 11.3  | 11.6  | 12.0  |
| Public                                      | 2.5   | 2.5         | 2.9   | 2.8   | 2.8   | 2.8   | 2.9   |
| Gross national saving                       | 11.3  | 10.0        | 10.2  | 10.5  | 11.0  | 11.1  | 11.5  |
| Private                                     | 14.4  | 12.2        | 11.0  | 10.0  | 9.6   | 9.6   | 9.6   |
| Public                                      | -3.0  | -2.2        | -0.8  | 0.5   | 1.3   | 1.5   | 1.9   |

Source: Central Reserve Bank of El Salvador; Ministry of Finance; and IMF staff estimates

**Table 5.37: Operations of the Nonfinancial Public Sector, Projections from the IMF Standby Agreement (in percent of GDP)**

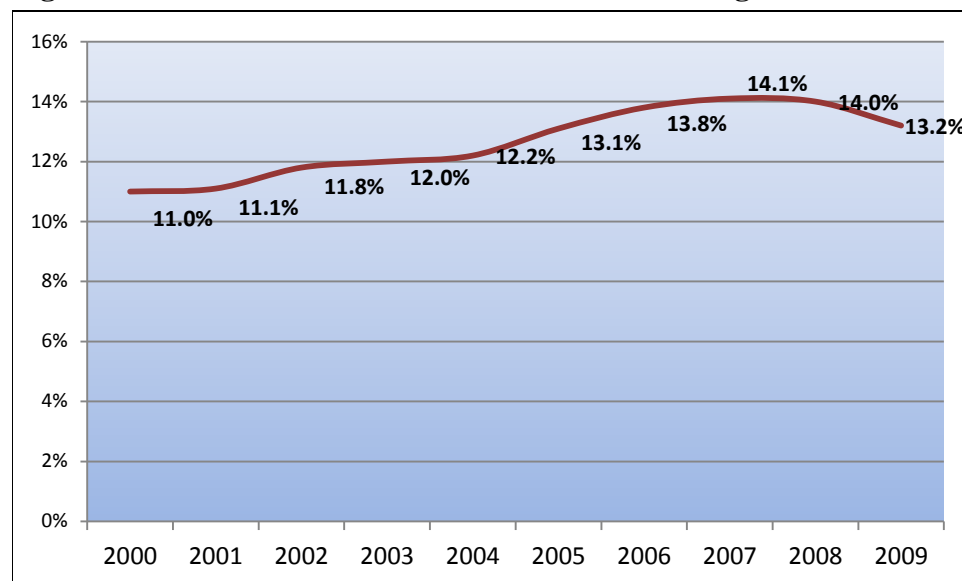
|   | 2006        | 2007        | 2008        | 2009        | Projections |             |             |             |             |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|   |             |             |             |             | 2010        | 2011        | 2012        | 2013        | 2014        | 2015        |
| <b>Revenue and Grants</b>                   | <b>17.1</b> | <b>17.1</b> | <b>16.9</b> | <b>16.1</b> | <b>17.2</b> | <b>18.4</b> | <b>19.0</b> | <b>19.5</b> | <b>19.7</b> | <b>19.9</b> |
| Current revenue                             | 16.8        | 16.8        | 16.6        | 15.6        | 16.6        | 17.5        | 18.5        | 19.3        | 19.4        | 19.7        |
| Tax revenue                                 | 13.3        | 13.4        | 13.1        | 12.4        | 13.2        | 13.9        | 15.0        | 15.8        | 16.0        | 16.4        |
| Nontax revenue                              | 2.9         | 2.9         | 2.8         | 2.7         | 2.9         | 3.0         | 2.8         | 2.8         | 2.7         | 2.6         |
| Of which: pension revenue                   | 0.1         | 0.1         | 0.1         | 0.1         | 0.1         | 0.1         | 0.0         | 0.0         | 0.0         | 0.0         |
| Operating surplus of the public enterprises | 0.6         | 0.5         | 0.8         | 0.5         | 0.5         | 0.6         | 0.6         | 0.7         | 0.7         | 0.7         |
| Capital revenue                             | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         |
| Official grants                             | 0.2         | 0.3         | 0.2         | 0.5         | 0.6         | 0.9         | 0.5         | 0.2         | 0.2         | 0.1         |
| <b>Expenditure</b>                          | <b>20.0</b> | <b>19.0</b> | <b>20.0</b> | <b>21.7</b> | <b>22.0</b> | <b>21.9</b> | <b>21.5</b> | <b>21.5</b> | <b>21.5</b> | <b>21.4</b> |
| Current expenditure                         | 16.9        | 16.3        | 17.0        | 18.6        | 18.8        | 18.3        | 18.0        | 17.9        | 18.0        | 17.9        |
| Wages and salaries                          | 7.0         | 6.9         | 6.9         | 7.9         | 8.1         | 7.9         | 7.9         | 7.9         | 7.9         | 7.9         |
| Goods and services                          | 3.8         | 3.6         | 3.7         | 4.1         | 4.1         | 3.9         | 3.8         | 3.8         | 3.8         | 3.8         |
| Interest                                    | 2.4         | 2.5         | 2.4         | 2.5         | 2.4         | 3.0         | 3.0         | 3.0         | 3.0         | 2.8         |
| Current transfers                           | 3.6         | 3.3         | 4.0         | 4.1         | 4.3         | 3.4         | 3.3         | 3.3         | 3.2         | 3.3         |
| Nonpension payments                         | 1.7         | 1.7         | 2.5         | 2.5         | 2.7         | 1.7         | 1.7         | 1.6         | 1.6         | 1.6         |
| Pension payments                            | 1.9         | 1.6         | 1.5         | 1.6         | 1.6         | 1.7         | 1.7         | 1.7         | 1.6         | 1.6         |
| Capital expenditure                         | 3.1         | 2.8         | 3.0         | 3.0         | 3.1         | 3.6         | 3.5         | 3.5         | 3.5         | 3.6         |
| <b>Primary Balance</b>                      | <b>-0.5</b> | <b>0.5</b>  | <b>-0.7</b> | <b>-3.0</b> | <b>-2.4</b> | <b>-0.4</b> | <b>0.4</b>  | <b>1.0</b>  | <b>1.1</b>  | <b>1.3</b>  |
| <b>Overall Balance</b>                      | <b>-2.9</b> | <b>-1.9</b> | <b>-3.1</b> | <b>-5.6</b> | <b>-4.8</b> | <b>-3.5</b> | <b>-2.5</b> | <b>-2.0</b> | <b>-1.8</b> | <b>-1.5</b> |
| <b>Financing</b>                            | <b>2.9</b>  | <b>1.9</b>  | <b>3.1</b>  | <b>5.6</b>  | <b>4.8</b>  | <b>3.5</b>  | <b>2.5</b>  | <b>2.0</b>  | <b>1.8</b>  | <b>1.5</b>  |
| External                                    | 2.7         | -0.6        | 1.3         | 3.7         | 1.6         | 2.1         | 1.1         | 0.9         | 1.9         | 1.0         |
| Disbursements                               | 4.8         | 1.0         | 2.6         | 5.1         | 2.9         | 6.1         | 2.3         | 1.9         | 2.8         | 1.9         |
| Amortization                                | -2.2        | -1.6        | -1.4        | -1.4        | -1.4        | -4.0        | -1.1        | -1.0        | -1.0        | -1.0        |
| Domestic                                    | 0.3         | 2.5         | 1.8         | 1.8         | 3.2         | 1.4         | 1.4         | 1.1         | -0.1        | 0.6         |
| Central bank                                | -0.3        | 0.7         | 0.1         | -1.4        | 1.8         | 0.0         | 0.0         | -0.2        | 0.0         | -0.3        |
| Banking system                              | 0.4         | 0.2         | 0.4         | 1.1         | 0.1         | -0.1        | 0.0         | -0.1        | -0.2        | -0.5        |
| Private sector 1/                           | -0.1        | 1.6         | 1.6         | 1.9         | 1.3         | 1.5         | 1.5         | 1.4         | 0.2         | 1.4         |
| Other                                       | 0.2         | -0.1        | -0.3        | 0.2         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         |
| <b>Memorandum Items:</b>                    |             |             |             |             |             |             |             |             |             |             |
| Current balance                             | 0.0         | 0.5         | -0.3        | -3.0        | -2.2        | -0.8        | 0.5         | 1.3         | 1.5         | 1.9         |
| Pension balance                             | -1.8        | -1.5        | -1.4        | -1.6        | -1.5        | -1.6        | -1.6        | -1.6        | -1.6        | -1.6        |
| Gross financing needs                       | 6.3         | 5.0         | 7.1         | 9.3         | 6.8         | 8.2         | 4.3         | 3.5         | 3.3         | 3.0         |
| Implicit nominal interest rate (in percent) | 6.3         | 6.5         | 6.5         | 5.8         | 5.0         | 6.2         | 6.0         | 6.1         | 6.3         | 6.1         |
| Gross Nonfinancial Public Sector Debt       | 39.4        | 38.8        | 39.7        | 48.5        | 50.0        | 51.0        | 50.7        | 49.6        | 48.2        | 46.8        |
| Total public sector debt (gross) 2/         | 41.7        | 39.1        | 41.2        | 49.5        | 51.2        | 52.1        | 51.8        | 50.6        | 49.1        | 47.7        |
| Total public sector debt (net) 2/ 3/        | 36.5        | 34.9        | 37.8        | 44.2        | 47.9        | 48.9        | 48.8        | 47.6        | 46.3        | 44.8        |
| Nominal GDP (million U.S. dollars)          | 18,749      | 20,377      | 22,107      | 21,101      | 21,796      | 22,953      | 24,284      | 25,972      | 27,802      | 29,732      |

Source: Central Reserve Bank of El Salvador; Ministry of Finance; and IMF staff estimates



Since the beginning of the 1990s, the tax burden, defined as tax revenue as a percent of GDP, has increased significantly in relatively short periods as compared to GDP growth, although it remains significantly below regional and global averages. For example, according to data from the Ministry of Economy, between 1989 and 1995 the tax burden increased from 5.0 percent to 12 percent and the tax burden rose steadily throughout the 2000s. It is worth noting that these major increases in tax burden occurred during periods of relative prosperity; the tax burden lessened significantly after the global economic crisis.

**Figure 5.38: El Salvador Tax Revenues as a Percentage of GDP**



Source: Graph produced using data from the Ministry of Economy of El Salvador<sup>30</sup>

According to expert estimates and despite efforts in the last few years to improve tax administration, levels of evasion continue to be too high, posing a significant obstacle to achieving GOES goals for tax revenue by the end of 2014 (16 percent of GDP).

Applying the four tests, we conclude that macroeconomic risk is not a constraint for growth under the current conditions of the country. The shadow price of public debt is low, as interest rates are lower than the regional average, and the most recent debt issuance was oversubscribed. In addition, inflation is very low compared to other countries in the region. Agents in the economy do not seem to be attempting to overcome or bypass the constraint by hedging against inflation risk, and inflation is not perceived as an important obstacle for investing in the country. Lastly, there is no evidence that agents who are less intensive in macroeconomic risks, such as international companies with foreign holdings, are thriving more than others in this country. Nevertheless, it could eventually turn into one of the most important constraints if the country's

<sup>30</sup> There is an approximately 1 percent discrepancy between the IMF estimates and the estimates from the Ministry of Economy. This is most likely due to recent revisions to GDP measurements. Despite the difference between these graphs, the point remains the same—despite recent increases, El Salvador's tax burden is low relative to the region and the globe.



deficit worsens. The evidence above suggests that this could occur. In spite of the fact that El Salvador has identified a plan to correct its fiscal imbalance, there is a risk that these objectives will not be met. As a result, while this was not identified as a binding constraint, it merits continued monitoring and action to ensure that it does not become a binding constraint.

#### **f. Analysis of Self Discovery**

Hausmann and Rodrik (Hausmann and Rodrik, Economic Development as Self-Discovery 2003) define self-discovery as learning what one is good at producing. Self-discovery is about making the right decision, which determines the pattern of specialization. For the entrepreneur, making the right decision is not a trivial matter, since knowledge of the production functions of existing goods is not common to economic agents. This is a crucial recognition made by the self-discovery model and which is supported by much literature, as opposed to the basic neoclassical model that implicitly assumes production functions are known and common across existing firms and potential entrants.

The problem related to self-discovery is that the initial entrepreneur who discovers the right decision can only capture part of the social value that the knowledge generates. Therefore, this type of entrepreneurship could be undersupplied, especially in developing countries where intellectual property rights are poorly protected by instruments such as patents, so that there would be a shortage of supply of this knowledge, which would in turn hamper economic growth.

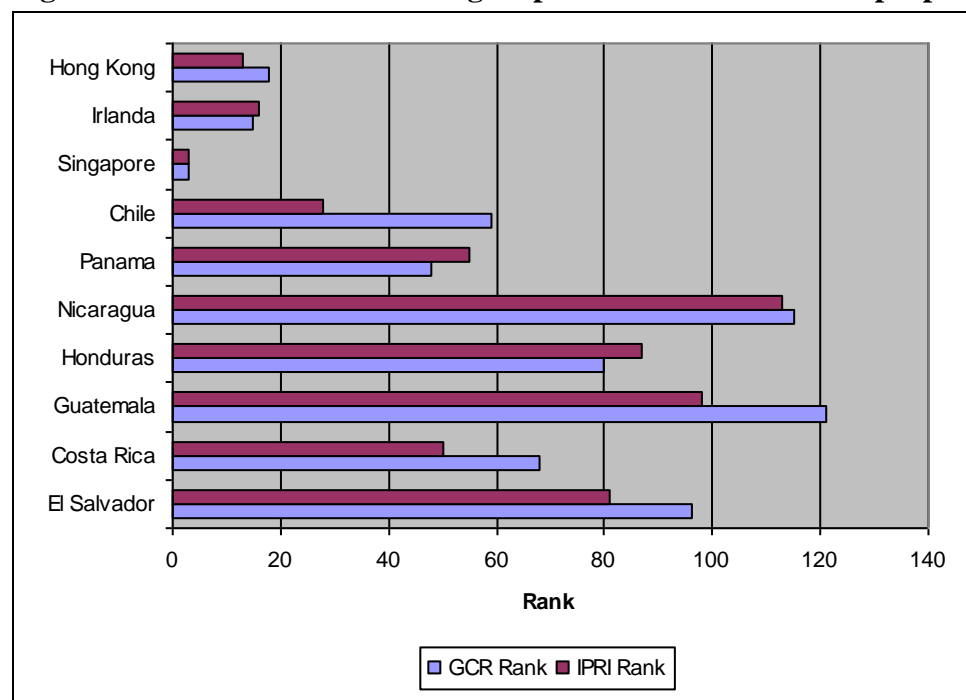
Innovation comes in two types, posit Hausmann and Rodrik (2003): discovering new goods and discovering that producing existing goods in new ways or in a new context (in a developing country, for example) can be profitable. Consequently, incentives in developing countries may be against the innovators not only due to deficient intellectual property rights protection, but also because of low barriers to entry in countries overperforming in economic reform, since imitators are able to easily enter the market and imitate, and thus free ride on the social returns created by the discoveries. Knowledge acquired by discovering that producing a product can be profitable spills over to other entrepreneurs. As protections for entrepreneurs of new products or new production decrease, the risk that a country falls prey to such a self-discovery trap increases.

#### *Existence of conditions that discourage self-discovery*

Before assessing directly with indices that evaluate the possibility that El Salvador is in such a trap, an attempt was made to evaluate the conditions that allow such a scenario, namely that intellectual property rights protection is limited and that there are low barriers to firm entry and imitation. Intellectual property appears to be only weakly protected in El Salvador, as international rankings on that subject from the recent Global Competitiveness Report (GCR) and International Property Rights Index Report show that although El Salvador ranks better than two countries in Central America, its performance (2.9) is worse than the averages in Central America (3.1), Latin America (3.1), and the world (3.7), and is worse, for example, than a country at an earlier stage in its development process (Honduras), even more poorly than

countries with better overall economic performance in Central and Latin America, and much worse than reference small countries in the world. Furthermore, the general ranking for El Salvador in the GCR is 82, while the intellectual property rights protection rank is 96. This indicates that relative to its overall performance, El Salvador lags behind in this particular component.

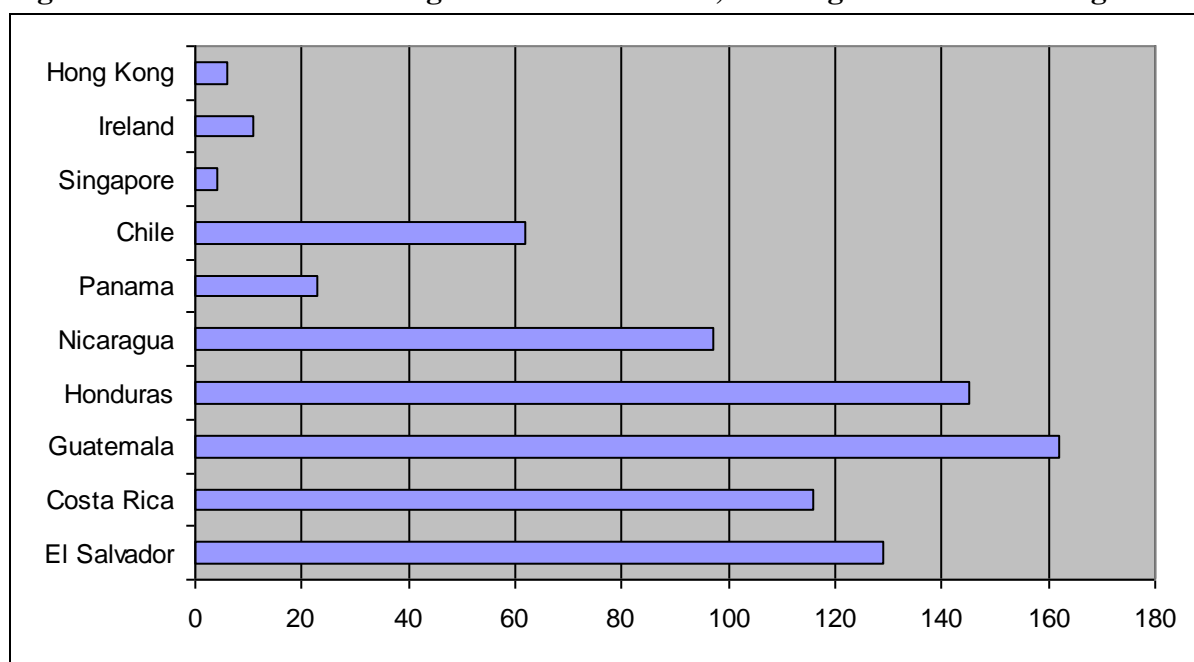
**Figure 5.39: International ranking on protection of intellectual property rights**



Source: *Global Competitiveness Report 2010-2011* and *International Property Right Index Report 2011*

For El Salvador to have the possibility of being trapped in a vicious self-discovery circle, market entry barriers to imitation firms would have to be low and discoveries must be readily copied. On the first front, despite the fact that El Salvador was considered to be a Latin American star reformer for some time after it launched its economic recovery following the civil war, barriers to market entry are rather high according to the World Bank Doing Business cross-country rankings (Hausman 2004); (Monge-Naranjo and Rodriguez-Clare 2008)). On this account, although El Salvador performs better than two countries in Central America, it is far from being an exemplary reforming country, and it does not follow directly that the state of market entry conditions in El Salvador would imply that the country could be stuck in a self-discovery trap. We note, however, that even if the standard conditions for this Rodrik/Hausmann-style self-discovery trap do not exist, that does not mean that self-discovery will happen. The absence of the trap parameters is arguably a necessary but not sufficient condition for self-discovery. Furthermore, while the barriers to entry may be helpful in a theoretical model of self-discovery by helping to internalize spillovers from demonstration effects, they are less helpful in imposing discipline to weed out low-productivity firms and encouraging factors to flow to their most productive use.

**Figure 5.40: World Bank Doing Business Indicators, Starting a business ranking**



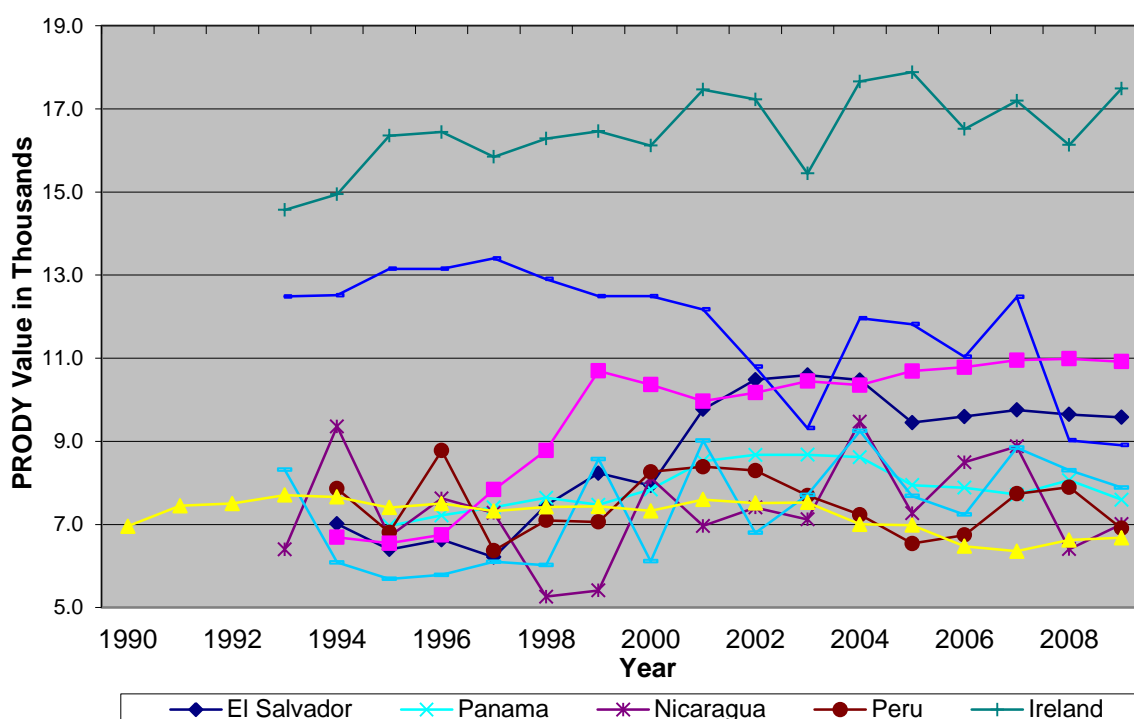
Source: *Doing Business 2011*

### *Evidence of self-discovery*

We begin the inquiry into the degree to which El Salvador is actually able to innovate and self-discover through a metric formulated by Hausmann, Hwan and Rodrik (2005), which is a measure of income/productivity level that corresponds to a country's export basket. This measure, called PRODY, may be taken to represent the sophistication of a country's export goods, so that the higher this value, the more sophisticated are the export products represented.<sup>31</sup> Though the indicator is not without its detractors, in some sense the PRODY is a measure of how closely a country's export basket represents the export baskets of developed countries, and thus is a measure of the country's export and growth potential. The Figure below presents the PRODY corresponding to the export goods of the countries that are presented.

<sup>31</sup> PRODY is a variable calculated at the product level as the "weighted average of the per-capita GDPs of the countries exporting a product, where the weights reflect the revealed comparative advantage of each country in that product". Hausmann and Rodrik (2005) also create a variable called EXPY, which is an export-weighted average of the PRODY for that country. In this analysis, this EXPY is calculated, although it is reported as country-level PRODY, using product level PRODY values during 1998-2000 as computed by Hidalgo, Klinger, Barabasi and Hausmann (2007) and applying the relevant annual export data during the available period.

**Figure 5.41: Country level PRODY values**



Source: Author's calculation based on Hidalgo, Klinger, Barabasi and Hausmann (2007) and COMTRADE data.

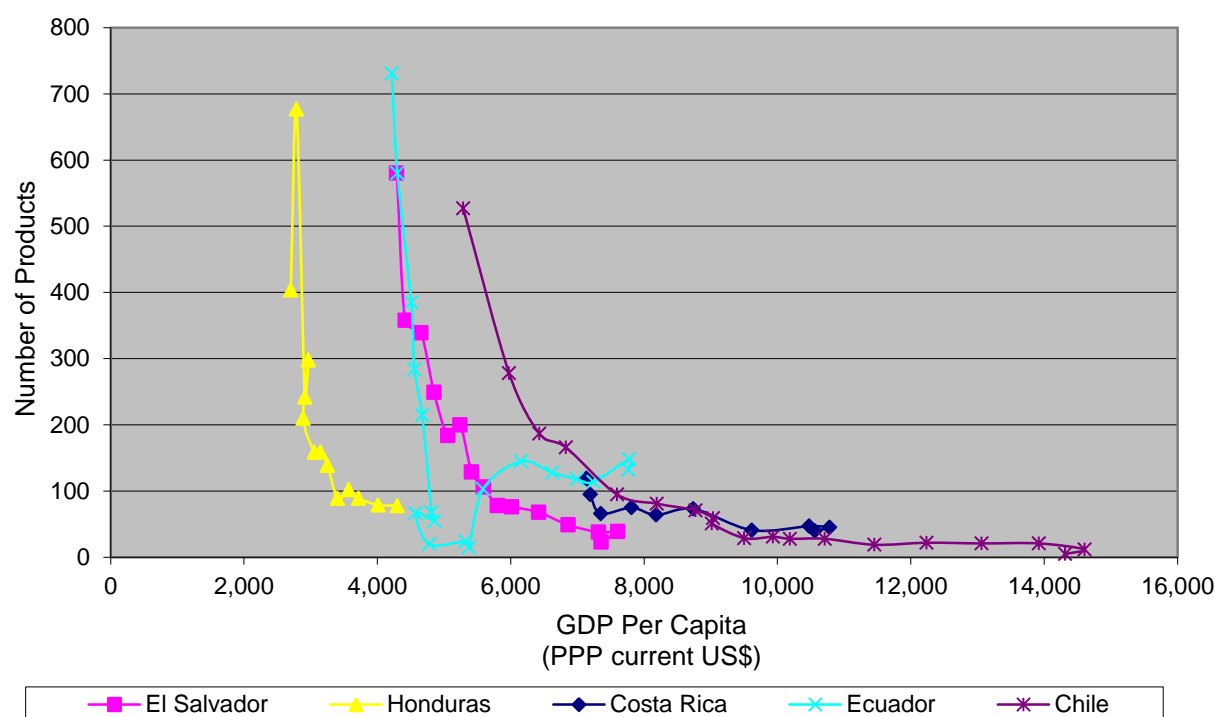
According to the calculations, El Salvador's PRODY value is comparable to the levels attained by many countries, including relatively well-performing countries in Latin America such as Costa Rica and Peru.<sup>32</sup> In fact, El Salvador's levels are above some other countries with high economic growth rates, such as Panama and Chile, in most of the years shown and especially in recent years. Even Hong Kong's levels are within reach, with El Salvador's values in some years being higher than Hong Kong's. Furthermore, calculations of PRODY average weighted with export value shows that they have a value of US\$16,704, which is even higher than the average PRODY graphed above. All of this evidence demonstrates that the sophistication of El Salvador's export products may not be considered so low as to consider that those products could be readily imitated.<sup>33</sup> The previous evidence tends to indicate that the country is not suffering from self-discovery problems, but the next section attempts to measure this more directly.

<sup>32</sup> A caveat to using the COMTRADE data for this analysis is admitted, namely that El Salvador's data up to 2004 does not include maquila exports. Since maquila exports represent an important part of total exports for the country, omission bias to a different degree is existent on the analysis in this section. Where this omission may be considerable is noted.

<sup>33</sup> In another paper that calculates average PRODY for export products at country level, Felipe, Kumar and Abdon (2010) estimate that this measure for El Salvador locates the country in the low tercile of the PRODY scale. Despite the fact that this may lead to consider that El Salvador's export products have low sophistication, that may not be the case as many other countries with high economic growth, such as Panama, Chile, Peru, China, India, Viet Nam, and even some industrialized countries (Australia and Hong Kong), are also in the same tercile.

To assess the degree of self-discovery efforts, the number of export discoveries made by El Salvador is compared to that of reference countries, as is illustrated below. As Klinger and Lederman (2010) indicate, it is important to recognize empirical evidence that shows that the number of export discoveries first rises as economic development takes place, but a purchasing power parity (PPP) per capita GDP of around US\$4,000 represents an inflection point after which that number starts to fall. Therefore, the figure below shows the new exports as a function of GDP.

**Figure 5.42: New products exported by PPP per capita GDP level**



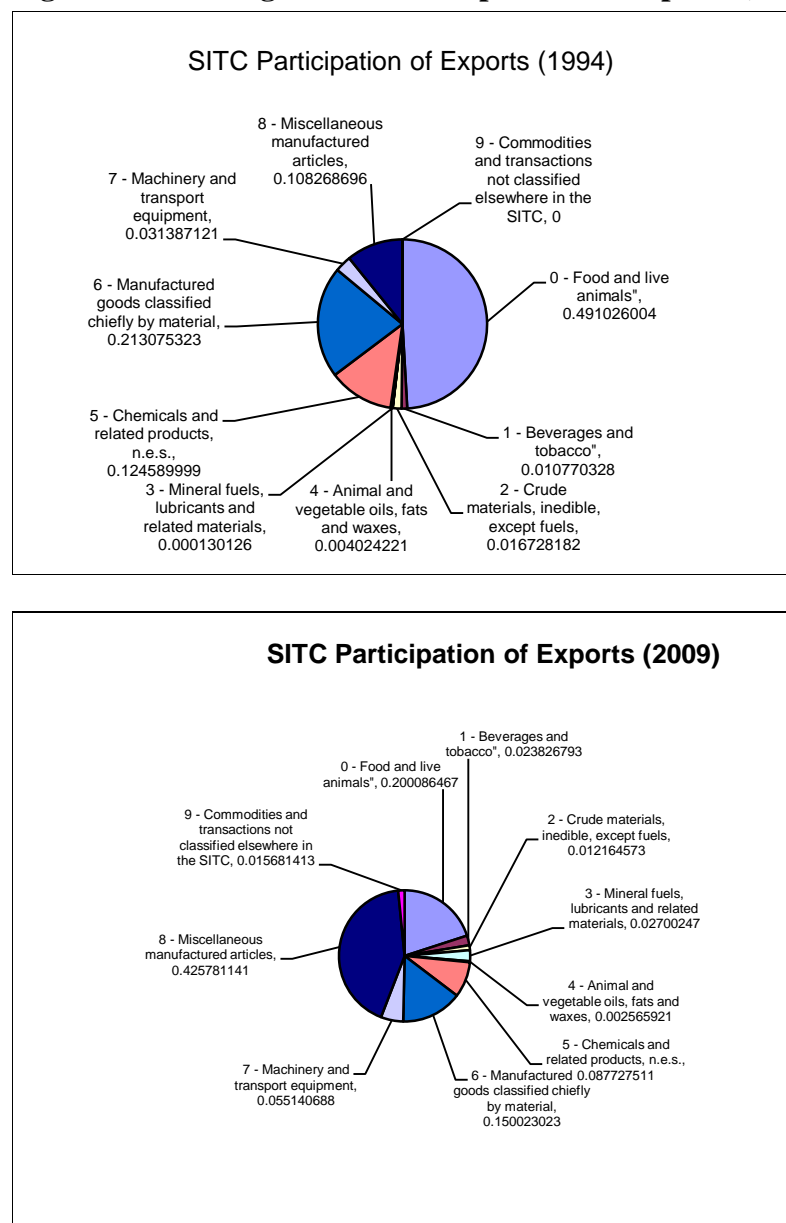
Source: Author's calculation based on COMTRADE and IMF data.

According to the figures shown, the level of El Salvador's export discoveries seems to be above the level shown by Honduras at the same per capita GDP level and also above Ecuador's level for some years. For given per capita GDP values, Costa Rica and Chile's levels are above El Salvador's, but that situates it between two performance groups. As such, the evidence seems to point that El Salvador's export discovery process is well within the norm.

Notwithstanding the evidence above, a decent number of export discoveries does not exempt a country from being in a self-discovery trap, as the quality of its discoveries has to be considered. In this sense, evolution over time of PRODY values is evaluated first, with which a clear rising tendency of the values is observed until 2002, after which PRODY tends to stabilize. Further analysis of the PRODY value by sector composition reveals the main reason why this value has

risen over the period. For this purpose, the change in sector composition of exports is shown first below, which presents that the main export sector shifted from food and live and animals, which represents the agriculture sector, to the miscellaneous manufactured articles, of which 84 percent consists of the apparel sector.<sup>34</sup>

**Figure 5.43: Change in sector composition of exports (1994-2009)**



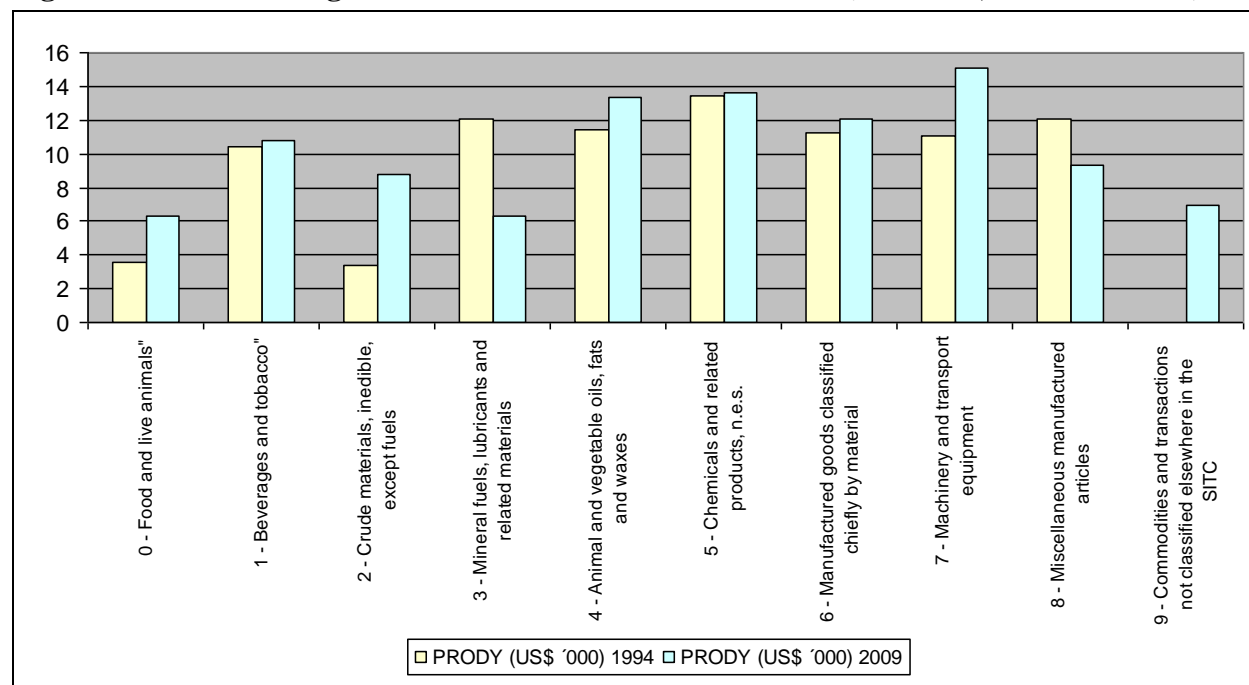
Source: Author's calculation based on COMTRADE.

With this in mind, it is noted that in 1994, food and live animals had a sector PRODY value of US\$3,526. On the other hand, in 2009, the largest sector, miscellaneous manufactured articles, had a PRODY value of US\$9,319. It is clear from this that the source of the increase in PRODY

<sup>34</sup> Due to the lack of data on maquila exports up to 2004, apparel exports may be underrepresented in the 1994 chart.

value for El Salvador is basically the change in the prevailing sector from agriculture, which has a lower PRODY value, to apparel manufacture, with a higher value. The figure below shows the PRODY value at the sector level in 1994 and 2009.

**Figure 5.44: Sector weighted PRODY values for El Salvador (US\$ '000; 1994 and 2009)**



Source: Author's calculation based on Hidalgo, Klinger, Barabasi and Hausmann (2007) and COMTRADE data.

Note: The values have been weighted by the export values at the product level (SITC 4 digits).

As the table below indicates, new products have not contributed significantly to the rise of Salvadoran PRODY value over time. However, this is not due to a low PRODY of the new products, as its value is much higher than that of old products. Rather, the low incidence of new products is due to the low share of the value of new product exports, which only represents around 2 percent of the export value in 2009.

**Table 5.45: PRODY by new and old exports since 1998**

|                         | Export value in 2009 (US\$ '000) | PRODY (US\$) |
|-------------------------|----------------------------------|--------------|
| <b>New Exports</b>      | 90,794                           | 16,704       |
| <b>Existing Exports</b> | 3,705,736                        | 9,576        |

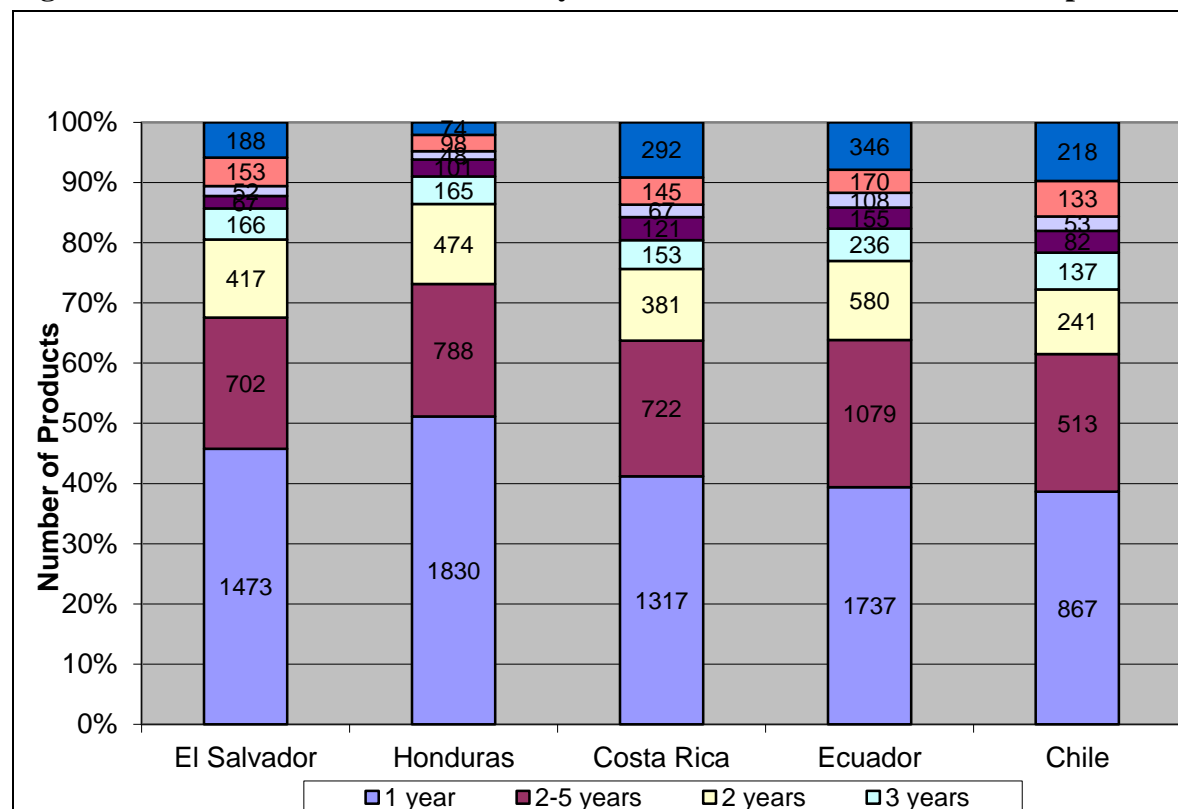
Source: Author's calculation based on Hidalgo, Klinger, Barabasi and Hausmann (2007) and COMTRADE data.

Note: The values have been weighted by the export values at the product level (SITC 4 digits).

Part of the reason that new products do not represent an important part of total exports is that many of the emerging products do not last for too long. The figure below shows that most of the new products, or almost 60 percent, for El Salvador remains as export goods for a year, while less than 10 percent remain for more than ten years. These results contrast somewhat to those for Costa Rica, Ecuador and Chile, though the differences are not particularly large. On the other

hand, Honduras' results diverge more clearly from those countries, and El Salvador's better performance as compared to Honduras is also clear. Therefore, despite the fact that this evidence points to poor results, El Salvador's performance may be considered within the norm.

**Figure 5.46: Number of New Products by Number of Years of Continuous Export**

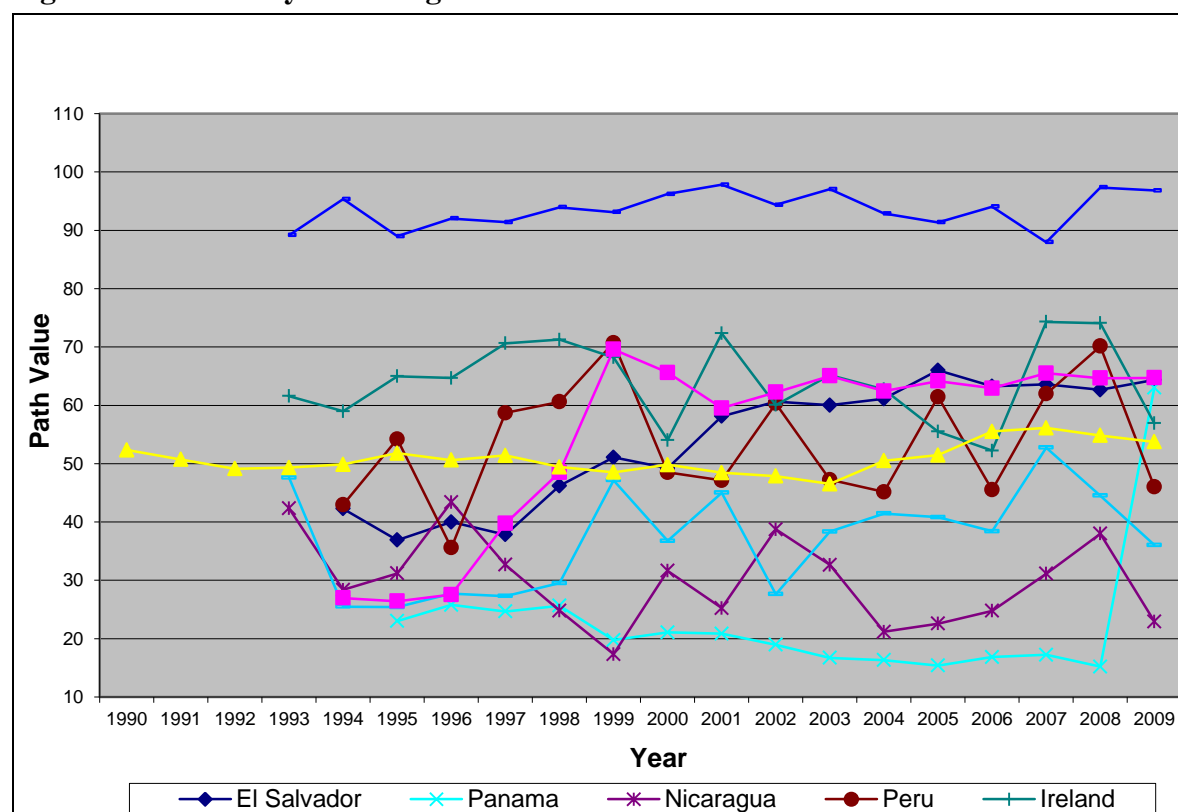


Source: COMTRADE data.

Another measure of the quality of new products, called PATH, is an index that attempts to project the speed of structural transformation, which occurs near the area of a country's space around the products for which that country has developed its comparative advantage (Hausmann and Klinger 2007). Countries are able to transform their productive structure and upgrade their exports more rapidly as they are able to have a path to nearby products that are increasingly of higher value. In this context, to derive PATH, first a measure of the distance between each pair of products based on the probability that countries in the world export both, called proximity, is calculated. PATH is then computed as the sum of the proximities that characterizes a good with the rest. This index represents how close in production possibilities a good is to all of the rest of goods. The average of PATH for a country's export goods reflects the closeness of that country's products to prospective products, of which the higher the value, the more upgrade the country can make of its export products. Country level PATH values over time are shown in Figure 5.47 below.



**Figure 5.47: Country level weighted PATH values**

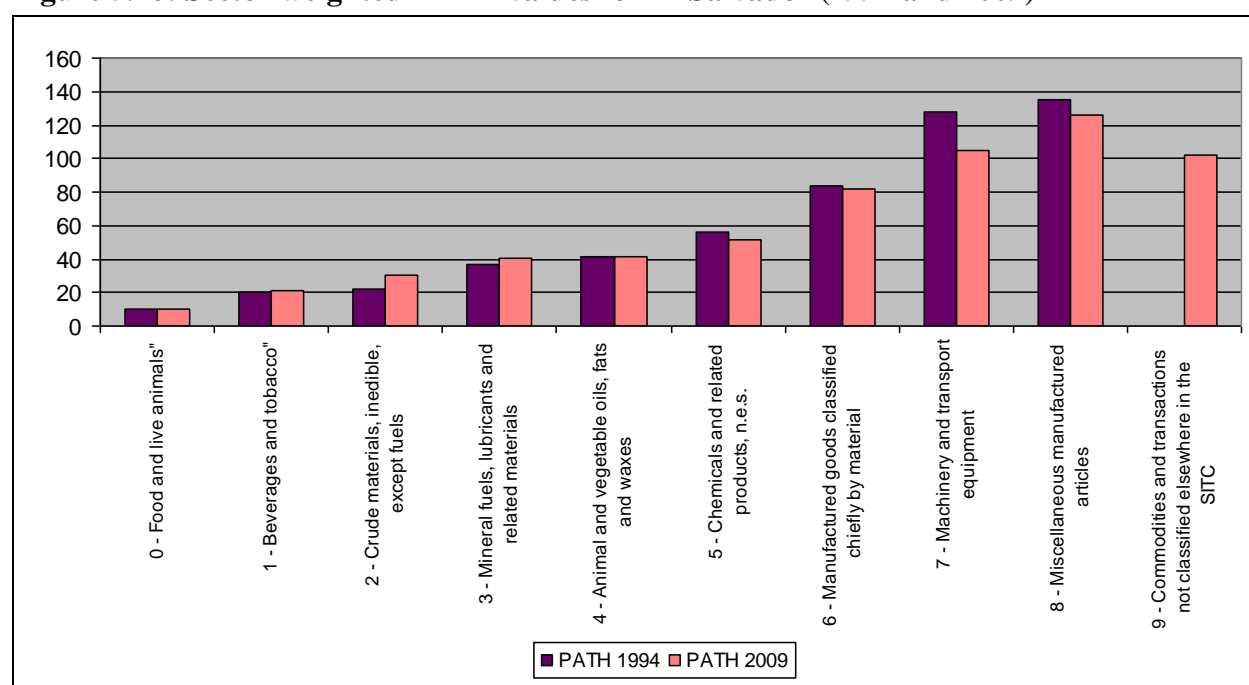


Source: Author's calculation based on Hidalgo, Klinger, Barabasi and Hausmann (2007) and COMTRADE data.

The Figure shows similar results to those for PRODY in that El Salvador's values increase until 2002, which are among the highest PATH values in the reference countries. These values are higher than most countries in many years, especially since 2001, and higher than all but one country in one year. This indicates that new product possibilities for the Salvadoran economy are getting more ample over time, since these products offer more new products that can be developed based on them. When the source of growth for the overall PATH value is considered by analyzing the sector PATH value, the same conclusion as that for PRODY is drawn, since the shift from agriculture to the apparel industry basically explains the growth.<sup>35</sup>

<sup>35</sup> Another finding from the sector PRODY and PATH Figures is that for most sectors, their PRODY and PATH values have increased during the period analyzed. In the case of PRODY, seven sectors experienced the increase, while for PATH, five sectors did. Amid these positive results, sector PRODY and PATH values for miscellaneous manufactured articles have decreased, with the case for PRODY having a particularly pronounced decrease of 23%. Since this is the most representative export sector that includes mainly apparel products, it is concerning that this sector's performance has diminished over time. However, the decrease in these values for apparel may be related to the maquila industry's production of less sophisticated products than the non maquila industry. If this is the case, this would strengthen the argument made later in this analysis about the maquila industry's low contribution to El Salvador's economic growth and development.

**Figure 5.48: Sector weighted PATH values for El Salvador (1994 and 2009)**



Source: Author's calculation based on Hidalgo, Klinger, Barabasi and Hausmann (2007) and COMTRADE data.

Note: The values have been weighted by the export values at the product level (SITC 4 digits).

The previous evidence suggests that, along with the finding that Salvadoran export product sophistication is not particularly low and that it is improving in time, aided to some extent by new product discoveries, the Salvadoran product basket is allowing structural transformation of the production structure.

At least that seems to be the story up to 2002, after which PRODY and PATH values stabilize, which may be indicative of stagnation in successful self-discovery efforts since then. This stagnation is evident also when observing the growth in export value in the period between 1994 and 2001 and then 2002 and 2009, where it can be seen that the growth in the first period is 6 percent while in the second it is only 4 percent.<sup>36</sup> Therefore, this evidence also tends to indicate that self-discovery efforts were more fruitful in the first period than in the second period.

Even the self-discoveries in export products that were made during 1994-2001 may be considered as not particularly successful when viewed with respect to their contribution to growth in gross domestic product (GDP). To test this, first the correlation coefficient between growth in export value and GDP was calculated during the whole period of 1994-2009, and El Salvador's value is compared to other reference countries'. The results are tabulated in Table 5.49 below.

<sup>36</sup> Since maquila exports are included only in data beginning in 2005 and a large increase in export value is observed in that year, the increase in that year has been imputed as the average of the rest of the years in the period.

**Table 5.49: Correlation between change in export value and GDP**

| Country            | Correlation Coefficient |
|--------------------|-------------------------|
| Nicaragua          | 0.24                    |
| <b>El Salvador</b> | <b>0.27</b>             |
| Panama             | 0.32                    |
| Guatemala          | 0.33                    |
| Chile              | 0.59                    |
| Ireland            | 0.61                    |
| Costa Rica         | 0.67                    |
| Peru               | 0.70                    |
| Singapore          | 0.73                    |

*Source: Author's calculation based on COMTRADE data.*

Table 5.49 shows that El Salvador has the second lowest correlation coefficient among the countries, meaning that its export growth explains its GDP growth less than most of the other countries. In other words, the contribution of export growth to GDP growth is very low, so that export discoveries have helped little in making the economy grow. Furthermore, the correlation coefficient is calculated for the two periods reviewed earlier, as shown in Table 5.50.

**Table 5.50: Correlation between change in export value and GDP for El Salvador in different periods**

| El Salvador | Correlation Coefficient |
|-------------|-------------------------|
| 1995-2001   | 0.50                    |
| 2002-2009   | 0.34                    |

*Source: Author's calculation based on COMTRADE data.*

The correlation is higher in the first period as compared to the second one, from which it can be concluded that export growth contributed more to GDP growth in the first period. These results may be perplexing when contrasted with the high degree of self-discovery efforts that El Salvador shows, but when the industry to which the country shifted its production is considered, they seem coherent, since the apparel maquila industry has little productive linkage to the rest of the local economy. The incentive provided to this sector has been mainly tax exemption for maquila processing of imported inputs for exporting the finished good, under a duty-free zone. A problem with this type of industry is that although it allows El Salvador to take advantage of its skillful but relatively cheap labor, the value in forward and backward linkages that the country enjoys from this activity is limited by the inability for other local activities to link to it. Therefore, the industries in the free zone activities provide somewhat disappointing benefit to the

country's economy. Moreover, the profitability of the maquila sector has eroded in recent years with increased competition from Southeast Asia.

Finally, although El Salvador has experienced a decent self-discovery process especially during 1995-2001, the self-discovery process appears to have stagnated over the last decade. It is also important to recognize that GOES has heavily promoted this sector for nearly two decades now, starting around the years during which the country was transitioning from the civil war era to more peaceful times. That self-discovery export efforts have been more successful in the context of a preferential public program, hints at the benefit of the Government of El Salvador providing some arrangements that could help the industry to perform better. The fact that few of the higher PRODY and PATH industries come from outside the special economic zones suggests that there may be basic productivity issues hampering the growth of exports which requires direct price offsets from these zones. It is important to recognize that the free zone program applies to any sector that may import inputs for its processing and subsequent export. In view of this, concentration of the apparel sector under this scheme for some time now may be indicative of some underlying problems in productivity and structural transformation, which may be reflected by the stagnant PRODY and PATH values since 2001. When this is associated with the fact that only industries supported by governmental promotion policies have flourished under the macroeconomic environment that characterizes El Salvador, the need for the Government of El Salvador to design an industrial policy that aims to further structural change seems evident.

In conclusion, this analysis found that while El Salvador's weak protection of intellectual property rights provides some evidence into one of the two necessary conditions of the Hausmann/Rodrik self-discovery trap, the evidence for the other necessary condition of ease of entry by imitators does not clearly hold. In more direct measurement of the potential existence of a self-discovery problem we observe that Salvadoran export products, including new one product emerging at a decent pace, tend to be increasingly more sophisticated and situated closer to other new and more sophisticated products, at least until 2002. This situation does not represent that of a country with a self-discovery constraint, at least until 2002. The decreased pace of self-discovery afterwards is thought to be a result of problems related to factors of productivity in tradables analyzed in the next section.

#### **g. Low Productivity in the Tradable Sector**

The term "tradables" refers to goods and services that are traded or *can* be traded internationally, and thus refers to exports and imports, or, from the point of view of a particular country's production, "tradables" refers to exports and import substitution (goods and services both produced and consumed domestically but which are also available on the world market). The prices of tradables are set by international markets, whereas the prices for non-tradables are set domestically.

Evidence suggests that El Salvador is plagued by low productivity in the tradables sector. We examine that evidence and judge whether that low productivity in the tradables sector is a binding constraint to growth in El Salvador.

Before examining the evidence, it is necessary to understand the intrinsic potential importance of the tradables sector in the El Salvador case. Several studies point out the benefits of export-led growth. In the “Report on the Strategies for Sustained Growth and Inclusive Development”, the Growth and Development Commission concluded that exports play a very important role in the growth process. Rodrik (2008) shows that developing economies with strong exporting sectors can reach high levels of growth, and Wacziarg (2007) shows that the structural change and economic growth processes are characterized by diversifying the export sector, increasing its competitiveness and improving the earning potential of the tradable goods sector. However, for *small* developing economies, export-led growth is more than beneficial, it is almost necessary. In a globalized world, small open states do not have the luxury of remaining closed to trade for a variety of reasons (Katzenstein 1985). The market size of small countries does not allow countries to depend exclusively on domestic demand for growth, so firms must turn to export markets to be able to reach the economies of scale in production technology to compete. Import substitution strategies are unlikely to achieve rapid growth in small countries in part because of the same issue of market size.

Some very small countries can achieve rapid growth by specializing in a few commodities or exports, but that strategy fails for somewhat larger—although still small—countries because a few industries cannot drive or sustain the entirety of the economy. Evidence for Latin America and the Caribbean (LAC) illustrates a U-shaped relationship between growth and population size. For LAC countries with fewer than 1 million inhabitants, per capita GDP grew at an average annual rate of 2.7 percent from 1981-2000; per capita GDPs in LAC countries with 1 to 10 million inhabitants shrunk at an average annual rate of -0.1 percent; and per capita GDP in Latin American countries with more than 1 million inhabitants grew at an average annual rate of 0.5 percent. El Salvador, with a population of 6.2 million people, fits squarely into this middle category (Ocampo 2002). The LAC data also show a positive relationship between exports as a share of GDP and the log of population size for the very small Caribbean nations of less than 1 million people, and a negative relationship with log population for those countries larger than 1 million people. This indicates that over the part of the inverted-U relevant (populations larger than 1 million) small countries are more export intensive than larger ones (see Technical Annex E). El Salvador, however, has a significantly lower export share than would be indicated by its population. Because of its size, El Salvador must be productive in its tradables sector in order to achieve the levels of economic growth that will propel it to a new stage of development.

For several reasons we use exports as a proxy for tradables in this section. First, exports are far easier to measure, as they must be declared in customs. Import substitution is a far more difficult construct to measure, and these measurement difficulties are compounded when making international comparisons. Second, as described above, exports are a particularly apt proxy in the

case of El Salvador as they are far more likely to lead to sustained strong economic growth than import substitution for reasons related to economies of scale and market size. Consequently exports are perhaps a more proximate measure for the particular mechanism of growth needed for El Salvador. Lastly, using exports as a proxy for tradables is not uncommon in the economic literature<sup>37</sup>.

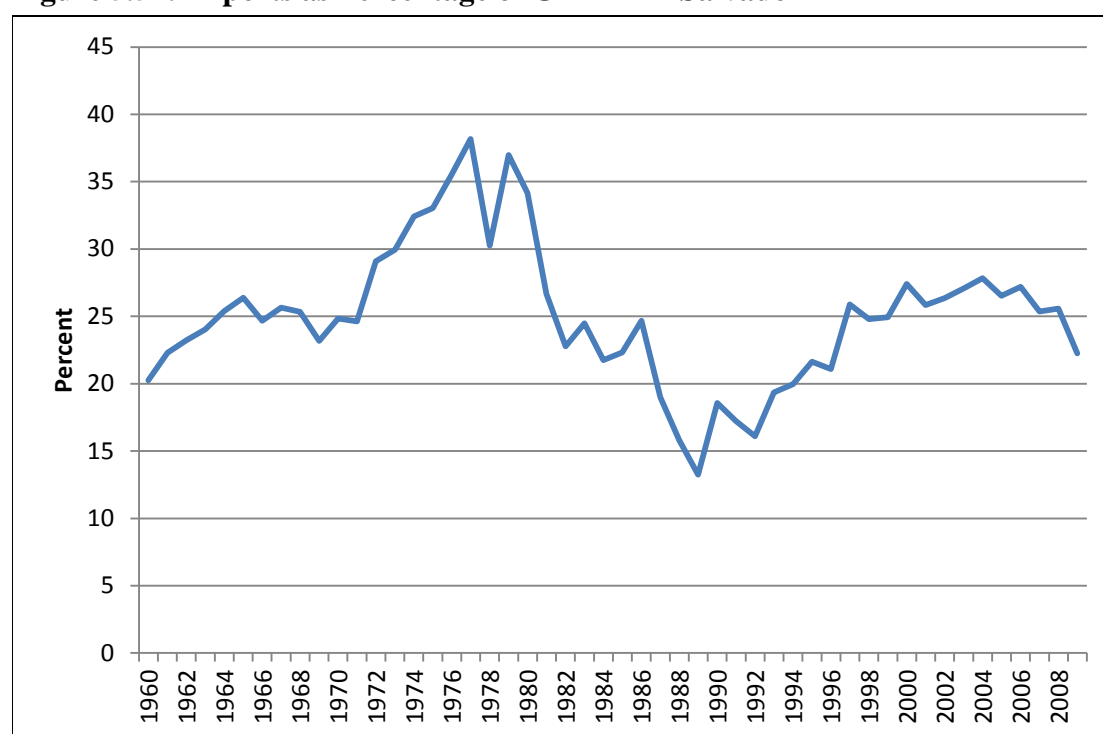
We use broadly three interrelated sets of comparator countries here. As with other sections of this Constraints Analysis, we use other countries in Central America. We also use states signatory to the CAFT-DR agreement as these countries have comparable trade and protection laws. Finally, we compare El Salvador with other countries in the world with a population between 1million and 10 million (noting that all of the countries in Central America are in this range except Guatemala with 14M). Countries of this size all have a need to engage in world markets through exports. None of these countries has an overwhelming commodity export that would skew data and misrepresent the relationship. Because of all of these factors, using comparisons based on exports as a percentage of GDP should accurately reflect any problematic differences with productivity in the tradables sector in El Salvador.

On those grounds, we analyze whether low productivity in tradables might be a problem in El Salvador, using available information on exports and other economic data. Over time, exports from El Salvador as a percent of GDP have fluctuated between 13 percent and 38 percent of GDP, but for much of that time the fluctuation occurred within a narrower range, between 20 and 27 percent. At present, El Salvador's exports as a percent of GDP is around 23 percent, nearly identical to where it was 50 years ago in 1960. El Salvador's exports as a percent of GDP went through a period of expansion in the 1960s and 1970s, followed by contraction during the civil war in the 1980s and the beginnings of a recovery in the 1990s. Most troubling, however, is the stagnation during the 2000s with a downward trend at the end of the period, showing that El Salvador has not expanded its export sector particularly well.

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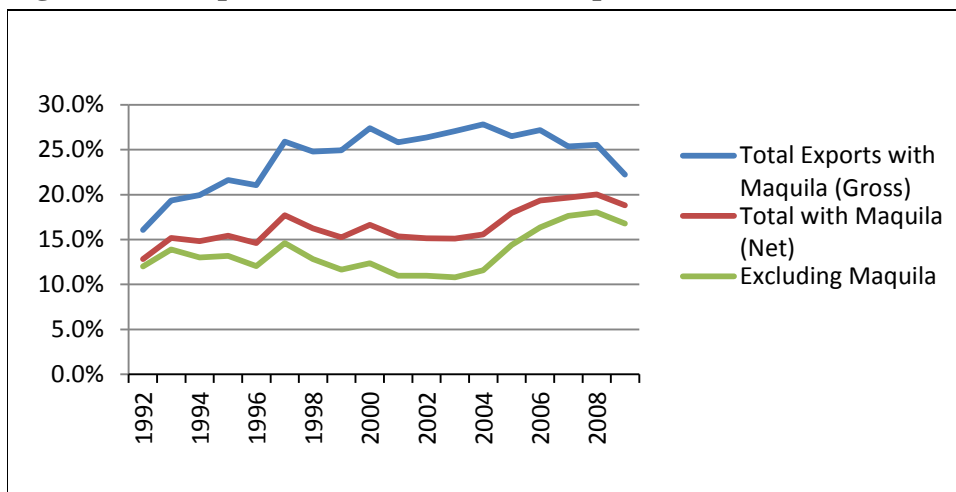
<sup>37</sup> See, for example, Calvo, Izquierdo & Talvi (2003) and Beine and Coulombe (2007).

**Figure 5.51: Exports as Percentage of GDP in El Salvador**



Excluding the maquila sector, which has been a significant contributor to El Salvador's exports over the last twenty years, shows an even less impressive performance. Looking at export performance with and without this important sector is relevant because the maquila sector has been a strong beneficiary of El Salvador's free trade zones and beneficial treatment through subsidies and tax incentives. As a result, and as will be explained later, their performance is atypical for El Salvador's tradables sector. According to the Central Reserve Bank of El Salvador, maquila constituted 55 percent of all exports in El Salvador in 2000. Applied to the WDI total export statistics, exports as a share of GDP would be a mere 12.4 percent if maquila exports were excluded. The difference between exports as a percentage of GDP with or without the Maquila sector has lessened significantly in the past ten years, as maquilas have stalled in the face of higher competition from Southeast Asia and non-maquila exports have managed to grow, but there is still a difference of at least 3.5 percent (See Figure 5.51).

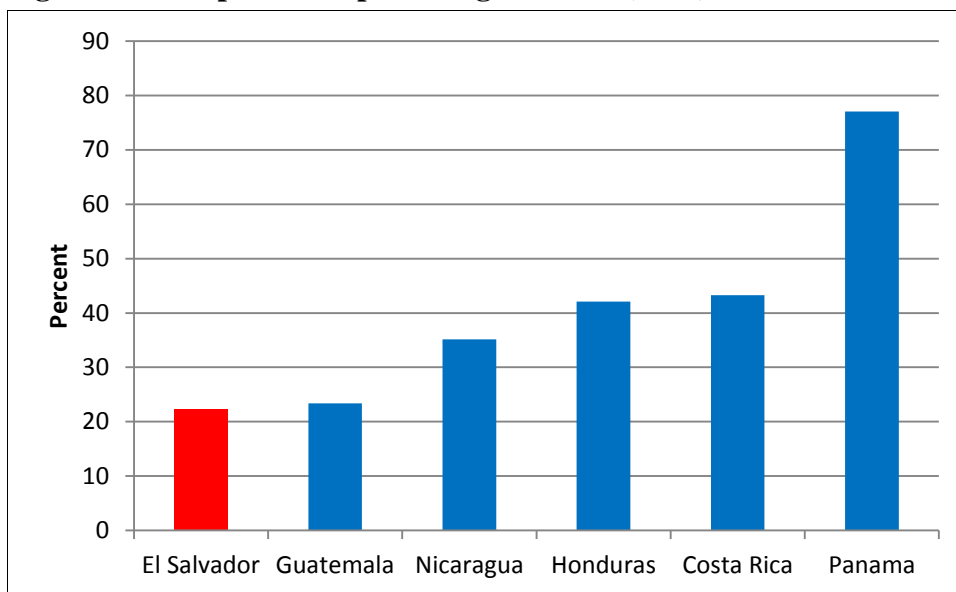
**Figure 5.52: Exports with and without Maquila**



Source: Shares of maquila to GDP from Banco Central de la Republica de El Salvador applied to export shares of GDP from World Bank World Development Indicators

Comparing El Salvador's export performance to other countries in the region begins to demonstrate the severity of this problem. Based on the most current figures and in comparison to other Central American countries, El Salvador has the lowest exports as a percent of GDP, as in Figure 5.52.

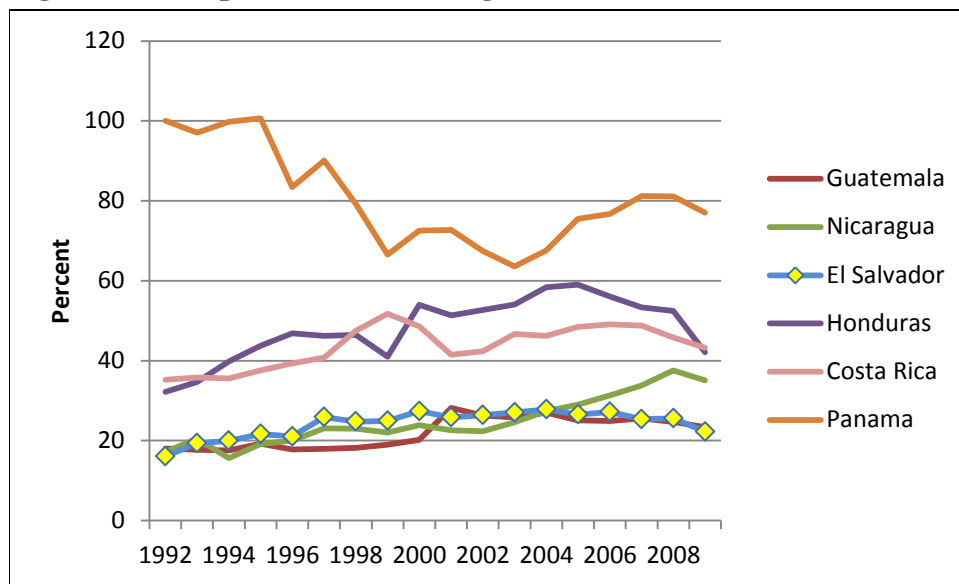
**Figure 5.53: Exports as a percentage of GDP (2009)**



While Guatemala may be somewhat less beholden to export-led growth due to its larger population of 14M and Panama's figure is inflated due to re-exports through the canal, El Salvador still remains at least ten percentage points below Nicaragua, Honduras and Costa Rica.

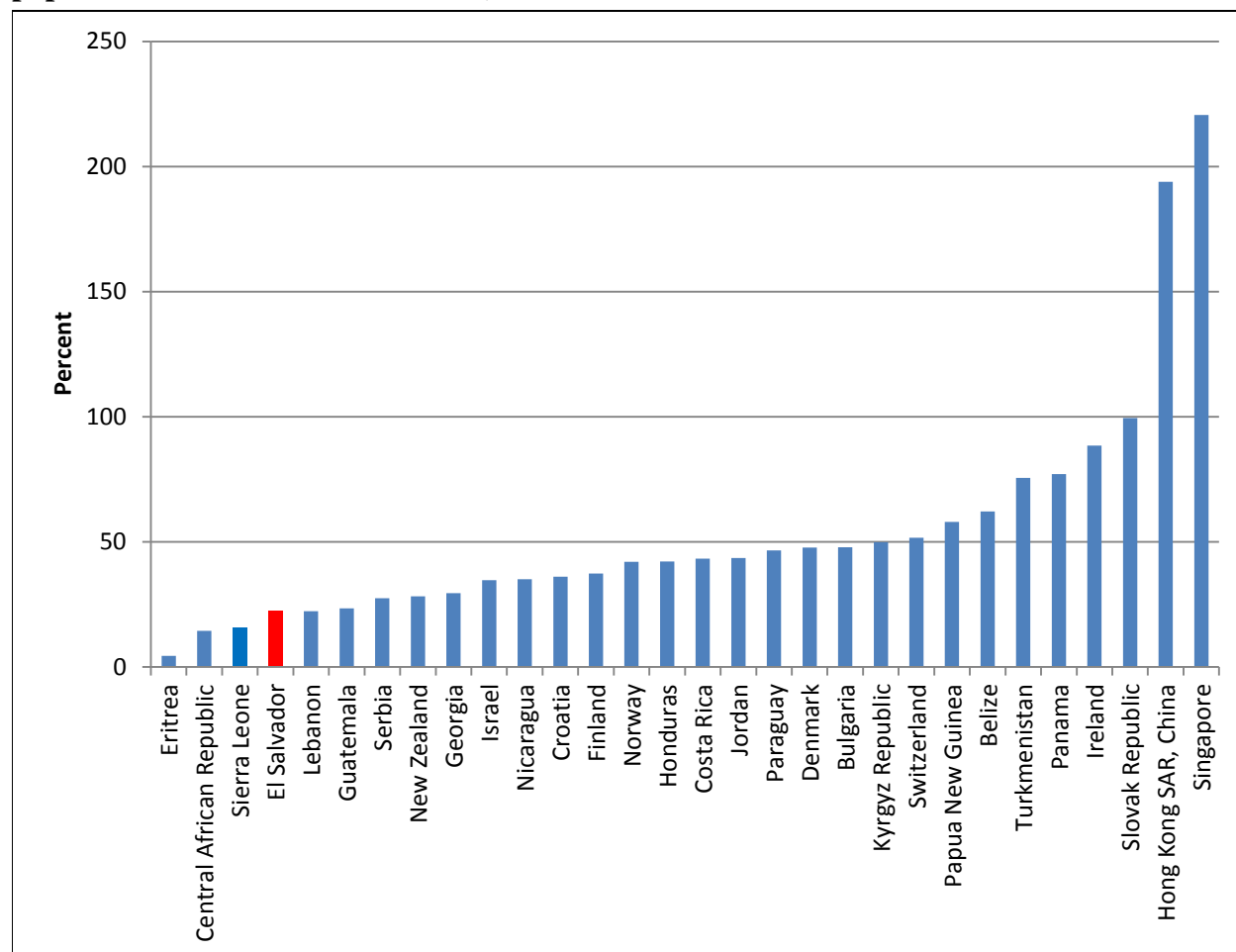


**Figure 5.54: Exports as a Percentage of GDP**



If economic theory holds and countries with populations of El Salvador's size are in particular need to develop a diversified export sector, it is elucidating to compare El Salvador further to include other countries with populations between 4 and 8 million people, as well as Central American countries. Based on this comparison, we see that El Salvador's performance is decidedly worse at present than the vast majority of its relevant comparator countries as it is well out on the lower tails of the distribution (See Figure 5.54).

**Figure 5.55: Exports as a Percentage of GDP (Central America and Countries with population between 4 and 8 million)**



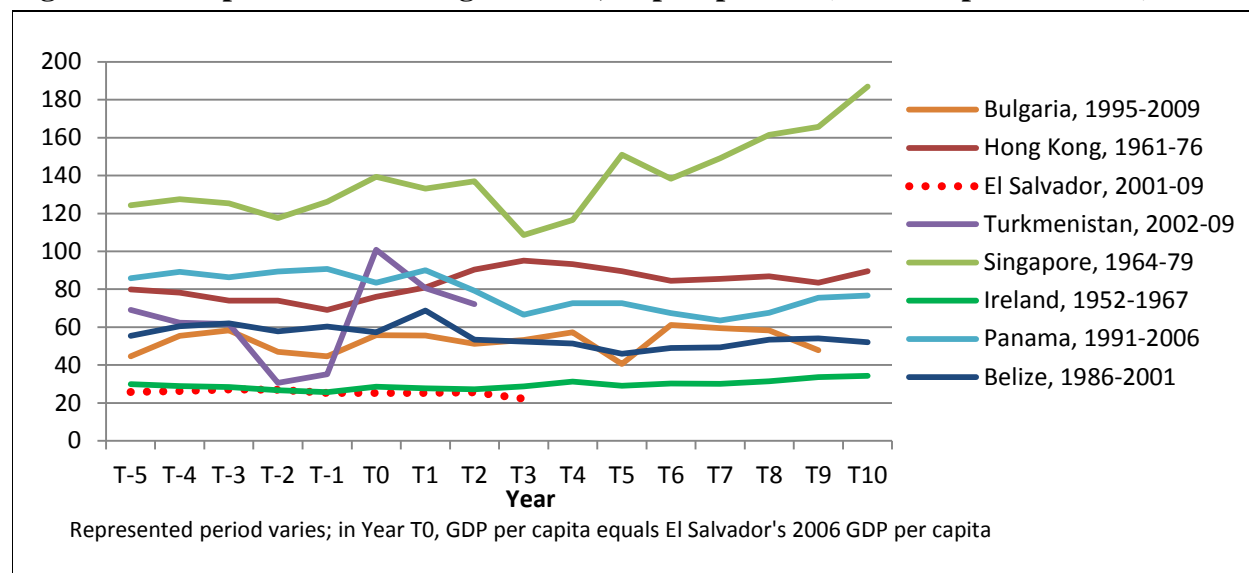
El Salvador's exports as a percentage of GDP are less than half of the average for this set of countries, and its exports/GDP exceed only that of Sierra Leone, the Central African Republic and Eritrea, among countries from its region or of a similar population size. It seems clear from all of this information that El Salvador underperforms in exports. This apparent underperformance is probably partially explained due to the low linkage of the export sector to the rest of the economy, as shown in the self-discovery section.

It is illuminating to compare the trajectory of exports as a share of GDP of the top performers<sup>38</sup> in the previous graph to El Salvador when they had similar levels of wealth. In figure 5.55 below we see that all of these countries were more intensive in exports when their economies were the size of contemporary El Salvador (taking the base year, T0, as El Salvador's GDP per capita in

<sup>38</sup>We report those in the top ten performers of exports as a share of GDP from countries in Central America or with a population between 4 and 8 million (2 million within El Salvador's roughly 6 million). In the Penn World Tables data we do not have data for Slovakia, Papua New Guinea, Switzerland, or the Krgyz Republic at income levels comparable to El Salvador in 2006.

2006). These countries went on to become the top performers for their size category, and we see that when their economies were the size of El Salvador's they had significantly more exports than El Salvador does now.

**Figure 5.56: Exports as Percentage of GDP, Top Exporters (CA or Pop. 4-8 million)**



Source: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 7.0, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, May 2011.

Thus, controlling explicitly for size of the economy and population, we see that El Salvador is well behind what it would want or need to be to grow to become like these countries.

Despite this, El Salvador shows some signs of potential export growth. As is shown in the following section on self-discovery, El Salvador exhibits PRODY and EXPY scores in a variety of industries that are in line with or better than comparator countries. In some important cases, this appears to potentially be a product of subsidies or tax breaks for certain sectors, but that is not universally true for all sectors. Based on this information, El Salvador should be growing in some sectors at higher rates, but it is not. This further insinuates that there may be a problem with productivity in the tradables sector.

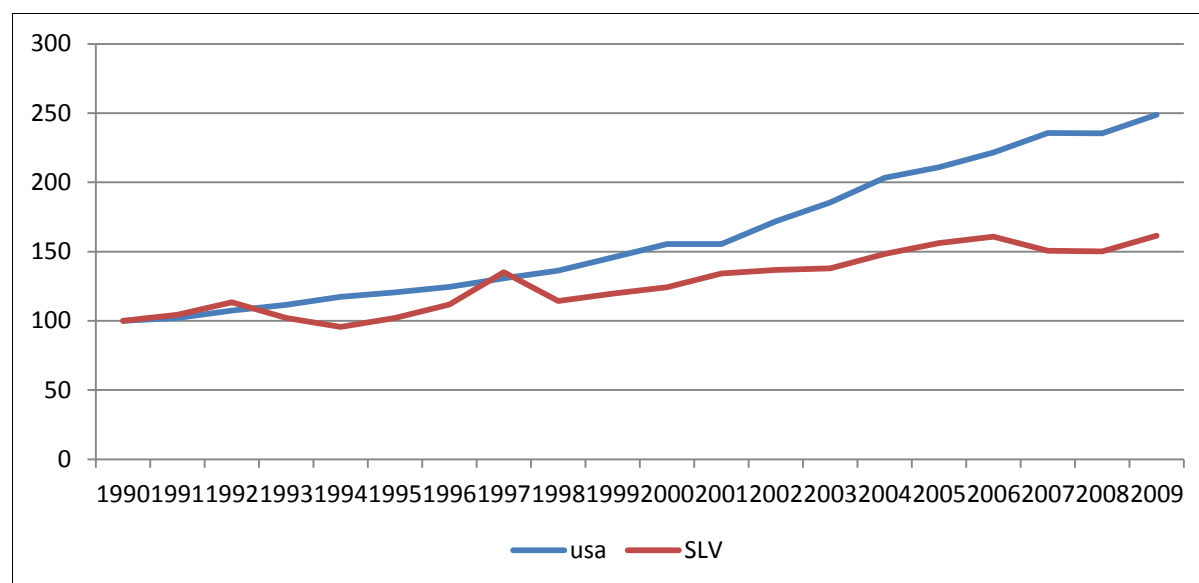
All of this information points to the possibility that low productivity in the tradables sector is a potentially binding constraint in El Salvador. As we apply the four tests to this potential constraint, it is important to emphasize that while this problem applies somewhat to the firms that already exist, it is a much more concerning problem when considering firms that are not forming in El Salvador. If productivity of the tradables sector is indeed a binding constraint to El Salvador, then firms that failed to start, failed to export or chose to locate somewhere else due to this problem represent an opportunity cost or “missing GDP” for El Salvador that cannot be captured until this problem is resolved. Since these firms do not exist we cannot measure them directly, but if the constraints to exports in El Salvador were removed, we would likely see more

of these firms in existence. The following applications of the tests, particularly of test 1, aim to understand the amount of GDP not created due to potential productivity challenges of tradables.

### 1. The shadow price of the constraint should be high

The perfect measure of the shadow price would be to measure the productivity of tradables in El Salvador versus comparator countries to determine El Salvador's relative performance. For a variety of reasons, some of which have already been discussed here, this is not feasible. As a result, it is necessary to rely on proxies, both for productivity and for tradables. One potential measure of productivity is the average real value added per person employed. We apply this metric to the manufacturing industry because resulting goods are typically oriented towards tradables and compare El Salvador's productivity with its largest trading partner, the United States. Comparing the U.S. and El Salvador reveals that this measure of labor productivity has grown much faster in the US than in El Salvador over the last 20 years, with a more pronounced differentiation since roughly 2001.

**Figure 5.57: Index of Labor Productivity in the Manufacturing Industry of the U.S. and El Salvador**



Note: Base: 1990=100

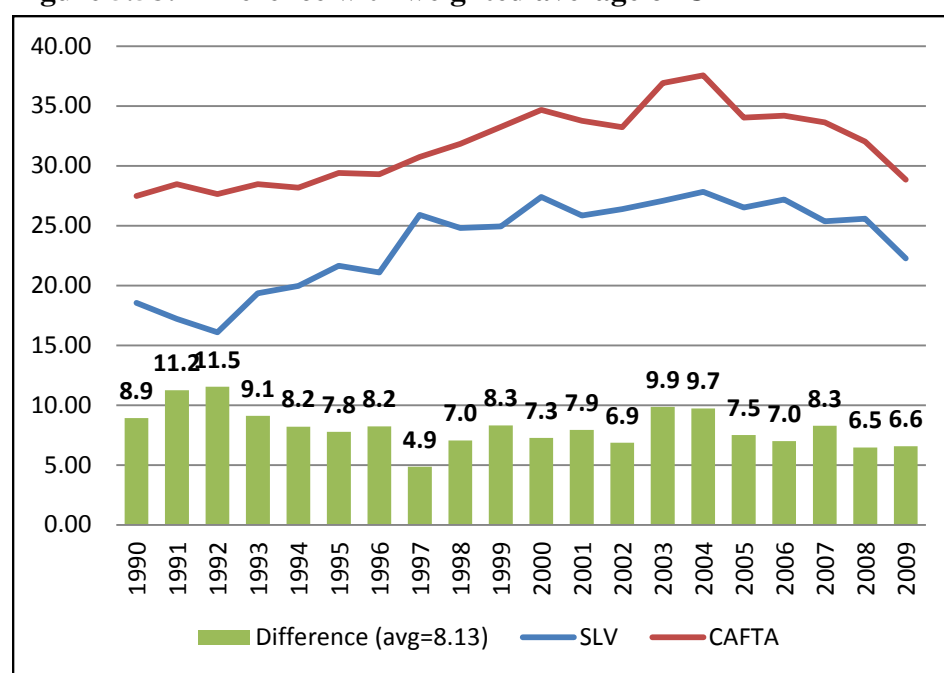
Another approach to the shadow price of competitiveness of tradables more generally is an estimate of the “missing tradables” that would have been produced if the country were not constrained in this area. Accordingly, we would like to measure the size of the tradables sector as a percent of GDP in El Salvador relative to similar figures for comparator countries. The magnitude of the difference in this metric between El Salvador and its comparators should indicate whether the shadow price is high or not. As explained previously, a reasonable proxy

for tradables in the Salvadoran case is exports. Here we examine El Salvador's exports as a share of GDP in comparison with a set of relevant countries.<sup>39</sup>

As none of the countries in Central America is a major commodity exporter, which would skew the data, it is reasonable to suppose that exports as a percentage of GDP accurately reflects any problems existing due to the level of productivity in the tradables sector. Such comparisons show that El Salvador does not compare well with relevant comparator countries. Over time, as Figure 5.57 shows, El Salvador's exports as a percentage of GDP have lagged behind those of its neighbors.

El Salvador's exports as a percentage of GDP is the lowest in Central America and is at least 10 percentage points below that of all Central American countries, except for Guatemala. Weighting the exports as a percentage of GDP by GDP in each Latin American signatory to the CAFTA-DR trade agreement yields a good approximation of the shadow price of El Salvador's low productivity:

**Figure 5.58: Difference with weighted average of CAFTA**



In this case, CAFTA-DR is a relevant set of comparators because all of the signatories face roughly the same set of trade policies. Over 20 years, El Salvador's exports as a percentage of GDP have been an average of 8.13 percentage points below the CAFTA-DR average export share. As a crude shadow price, this gap gives us a sense that if El Salvador's tradable sector

<sup>39</sup> While the absolute numbers would likely be different, the relative differences between El Salvador and its comparators would probably be roughly the same. Perhaps most importantly, data reflecting exports is widely available and considered accurate, making the relevant and necessary comparisons straightforward.

were more like the CAFTA-DR average, GDP in the country could increase—perhaps by as much as 8 percent.<sup>40</sup>

## **2. Movements in the Constraint Should Produce Significant Movements in the Objective Function**

In this case, movements in trade or the productivity of the tradables sector in El Salvador corresponding appropriately to movements in growth would support the argument that the low productivity in the tradables sector is a binding constraint to growth. In general, the notion that trade leads to growth is well-supported in economic literature. Anne Kreuger asserts that it is “now widely accepted that growth prospects for developing countries are greatly enhanced through an outer-oriented trade regime” (Krueger 1997). A range of econometric models points to the link between trade and growth<sup>41</sup>. Bems (2008), writing for the IMF, says that “one of the most consistent related empirical findings in the macroeconomic literature is that the relative price of nontradable goods in terms of tradable goods exhibits a strong positive correlation with income in cross-section as well as time-series data.” (Bems 2008) While general econometric evidence supports the theory, we aim to understand how the Salvadoran case performs.

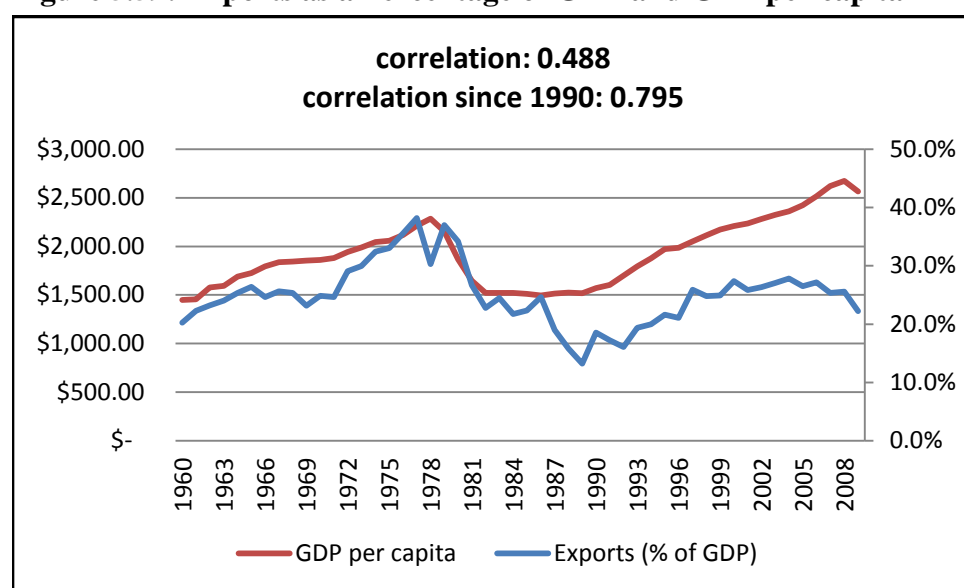
In El Salvador we find that they are strongly correlated. Since 1960, the beginning of this data set, the correlation has been an already strong 0.488. Since 1990, or roughly since the signing of the peace accords, the two have tracked more closely together at 0.795.

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<sup>40</sup> We note that the CAFTA-DR figures here include El Salvador’s exports. Excluding El Salvador from the calculation would, of course, widen the calculated gap between El Salvador and CAFTA-DR.

<sup>41</sup> While there has been some skepticism regarding these models, Srinivasan and Bhagwati firmly refute this as a critique of the methodologies used to prove this point, rather than the point itself, and conclude that the argument is still strong that there is a link between trade openness and growth (Srinivasan and Bhagwati 1999). Both sides acknowledge that trade openness alone is insufficient and that proper policies and institutional frameworks need to be in place. Rodrik, Hausmann, and Pritchett later demonstrate that growth accelerations, defined as increases in per-capita growth of 2 percentage points or more, “tend to be correlated with increases in investment and trade” (Hausmann, Pritchett and Rodrik 2005).

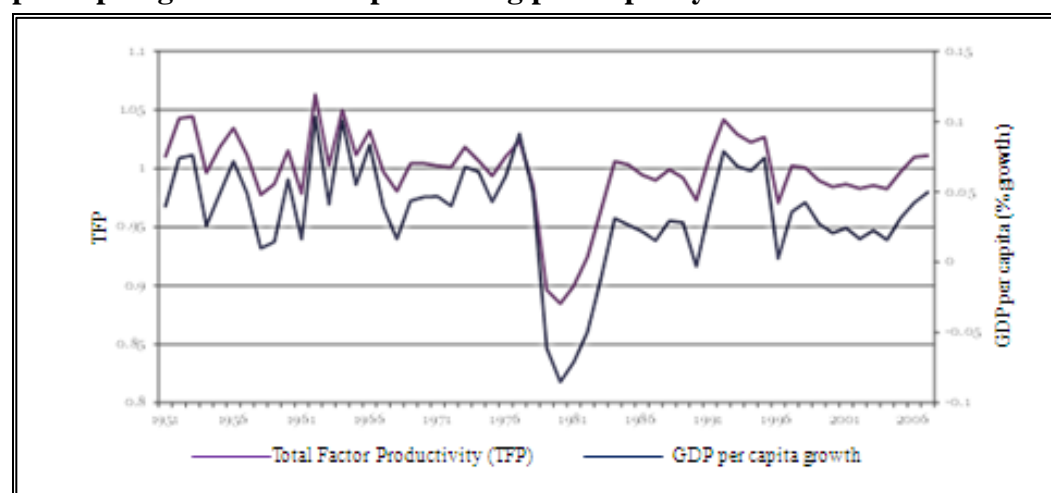
**Figure 5.59: Exports as a Percentage of GDP and GDP per capita**



While this relationship does not make any definitive statement about causality, it does show that when El Salvador's GDP moves positively and strongly with its exports.

Though the two concepts are almost tautologically related, it is useful to compare movements in Total Factor Productivity (TFP) growth with economic growth. Ideally we would compare TFP for only the tradables (or exports), but lacking that data we inspect the TFP for all of El Salvador's production, as shown in Figure 5.59.

**Figure 5.60: Total Factor Productivity (Hicks-Moorsteen index) in El Salvador and GDP per capita growth in 2005 purchasing power parity terms**



Source: Author's Calculation based on (Cabrera Melgar 2005).

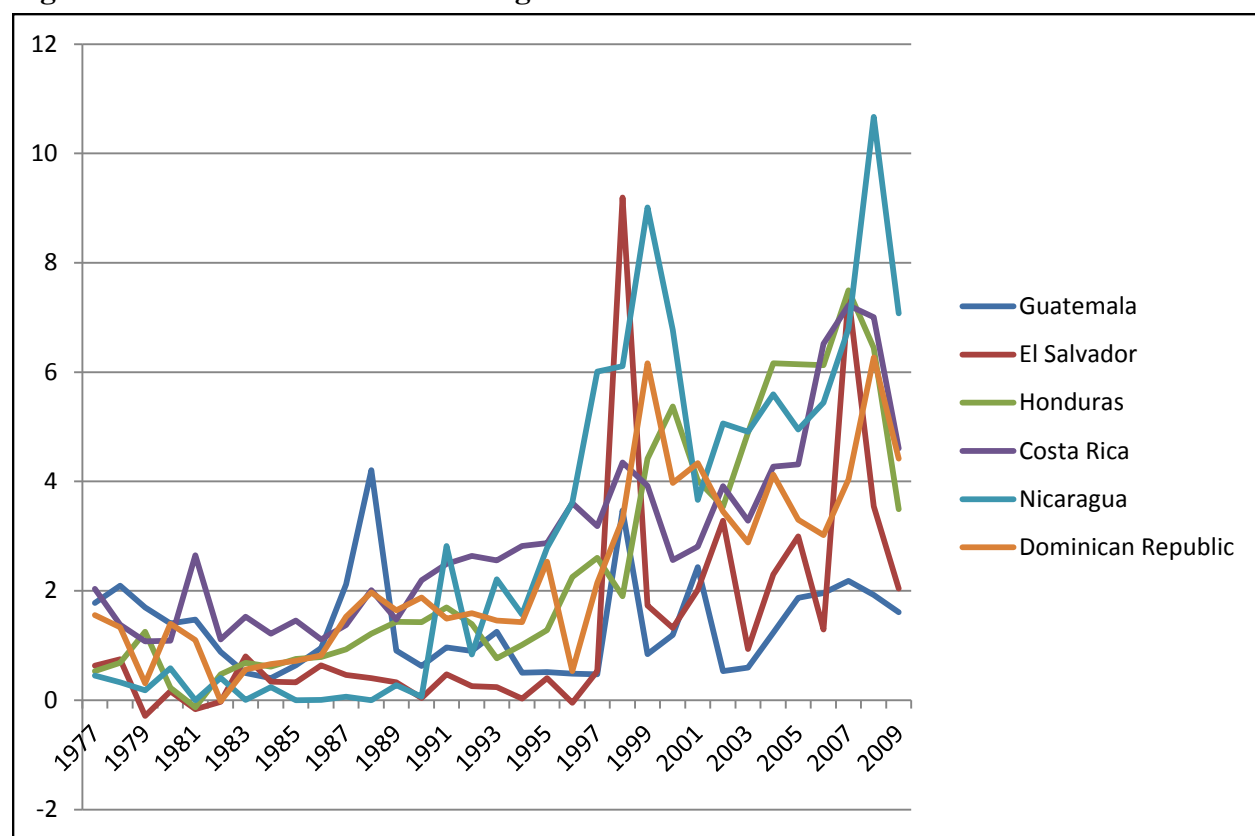
Not unexpectedly, GDP growth and TFP growth track together very closely. This graphical analysis does not determine causality but it does confirm that movements in productivity growth

in El Salvador correlate very closely with movements in per capita GDP growth. If exports move with growth and overall productivity of the economy moves with growth, the implication is that productivity in exports moves with growth. Taken together, the information provides suggestive evidence that movements in the constraint, low productivity in the tradables sector, results in movements in GDP growth in El Salvador.

### 3. Agents in the Economy Should be Attempting to Overcome or Bypass the Constraint

One way of examining if agents are overcoming or bypassing this constraint is to look at the behavior of foreign direct investment. These investors likely have the maximum flexibility in both deciding whether to invest in El Salvador and what to invest in when they do choose to invest in El Salvador. Information regarding the decision of whether or not to invest in El Salvador in the first place weakly suggests that low profitability of tradables as seen in Figure 5.60.

**Figure 5.61: FDI Inflows as Percentage of GDP**



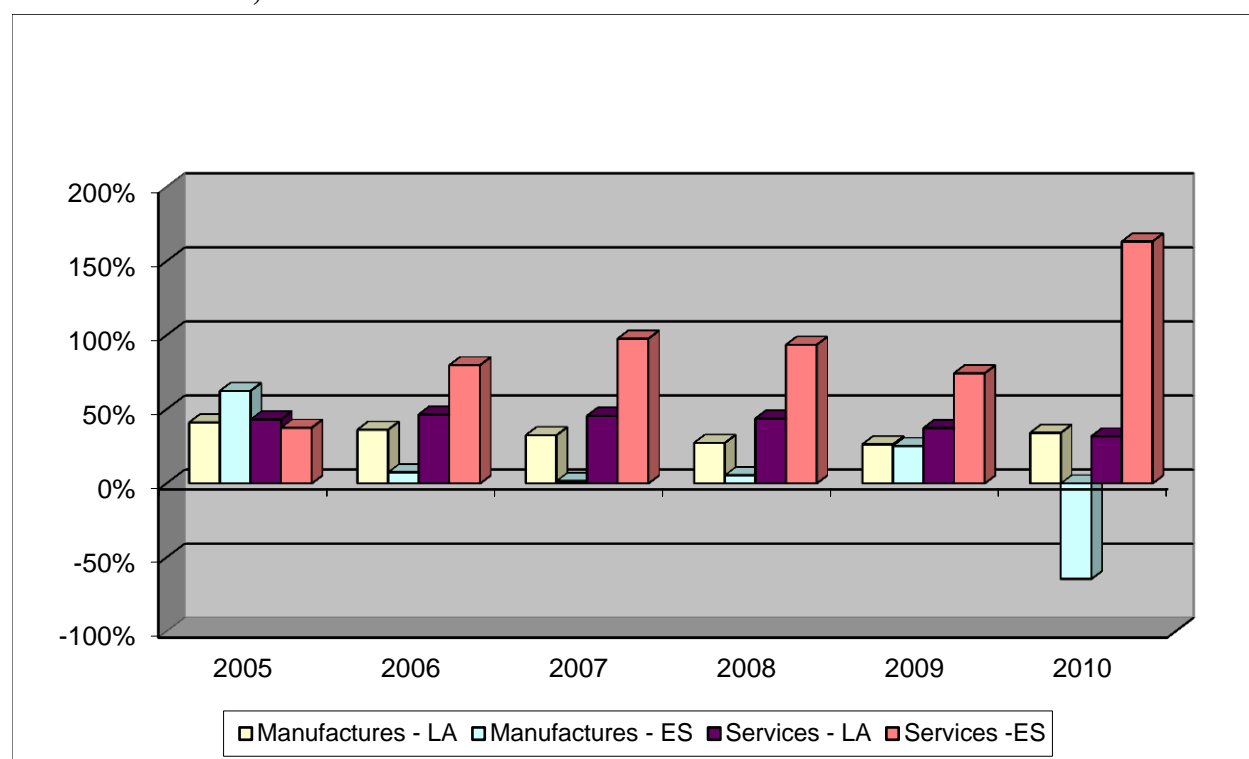
El Salvador consistently receives less foreign direct investment as a percentage of GDP than its regional comparators with the exception of Guatemala. To a certain extent, the fact that investors are choosing neighboring countries which face many of the same price competitiveness



pressures is weakly suggestive that El Salvador suffers from some internal problems, such as low productivity of the tradables sector.

Better evidence of the third test of a binding constraint due to low productivity of the tradables sector is found by examining where foreign direct investment that does occur in El Salvador is directed. In Figure 5.61 we see that investment flows are directed much more intensively towards non-tradables in El Salvador, a national trend which runs against the regional trend of foreign investment going towards tradables.

**Figure 5.62: Latin America and El Salvador: Net foreign direct investment inflows by destination sector, 2005-2010**



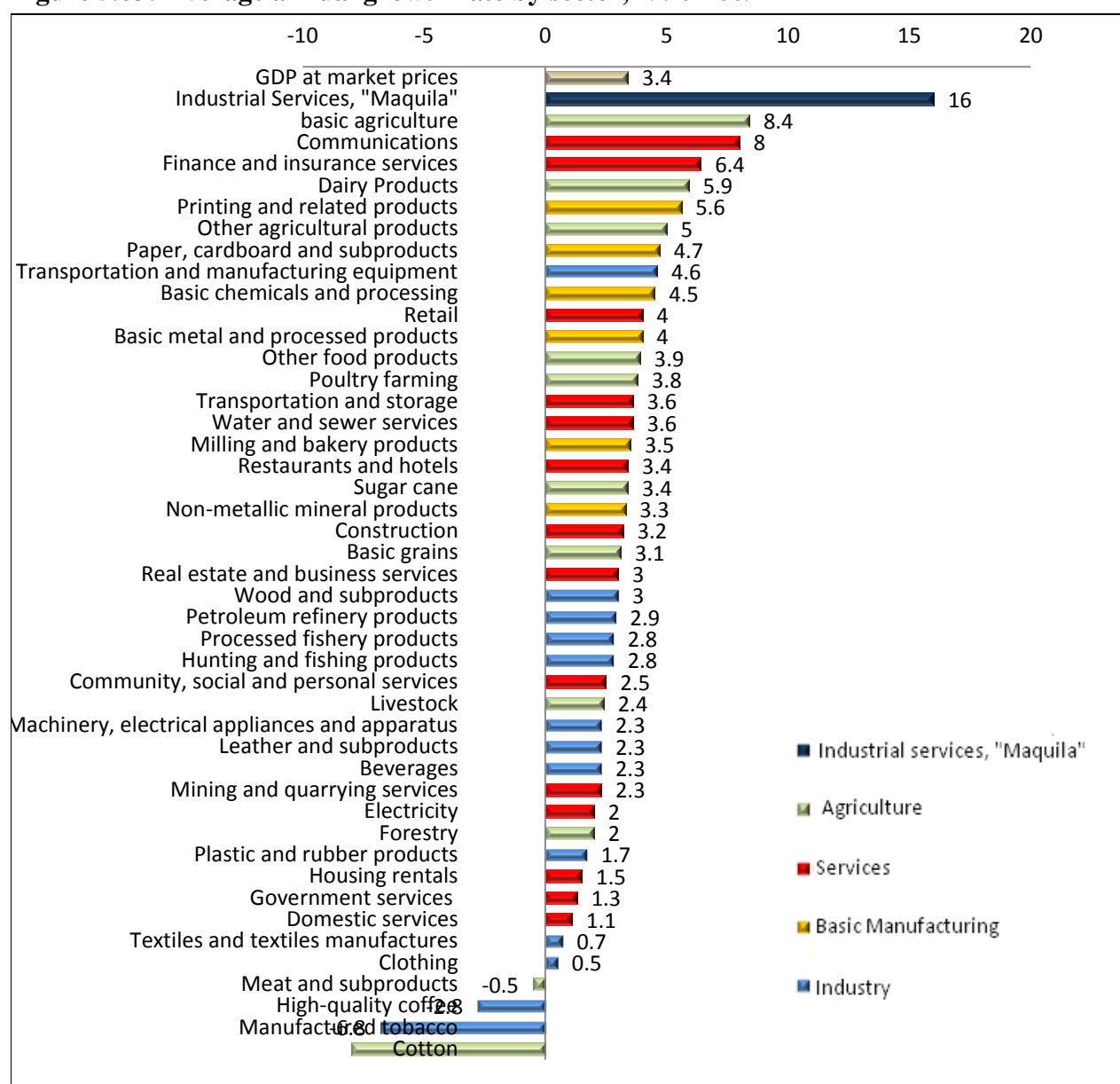
As the above graph shows, foreign direct investment in El Salvador is directed far more towards the less-tradable services sectors than the more-tradable manufacturing sectors, which is in stark contrast with the rest of Latin America, where foreign direct investment is directed towards manufacturing and services in a far more balanced fashion. While the distinction between services and manufacturing is not a perfect distinction between tradables and non-tradables, as has been mentioned before in this chapter, it is still informative in this case due to the magnitude of the differences. Over the last 5 years, foreign direct investment in El Salvador has been directed towards the services sectors an average of 91 percent of the time, compared to just 41 percent of the time for Latin America as a whole. In manufacturing sectors, the relationship is reversed: foreign direct investment has been directed towards manufacturing sectors only 6 percent of the time on average in El Salvador and 33 percent of the time on average in Latin America as a whole. This clear pattern of behavior on the part of investors in El Salvador to

avoid the tradables sectors, is fairly strongly suggestive that actors (here investors) are trying to get around a constraint of low productivity in the tradables sector, again suggesting that this issue is a binding constraint to growth in El Salvador.

#### **4. Agents Less Intensive in that Constraint Should be More Likely to Survive and Thrive, and Vice Versa**

In order to determine if agents that are less intensive in the constraint do better than their more intensive peers, we examine which agents ( in this case sectors of the economy) are thriving. The following graph (Figure 5.62) shows sectors of the economy and their average annual growth rates since 1990. In this case, the agents which are not thriving are probably sectors which simply do not exist in the economy—they are “missing goods” or “missing exports”—nonetheless, we perform this analysis on the information available from existing industries. Industries with annual growth exceeding the national annual GDP growth 3.4 percent could be said to be thriving. Of those 19 industries, 6 are basic agricultural products which are tradables, but they do not require a high level of productivity because El Salvador’s advantage is largely determined by natural resource endowments. Many of the other sectors are either non-tradables (transportation and storage, for example) or tradables of basic goods (basic metal and processed products). One significant exception to this is the growth in the maquila industrial services.

**Figure 5.63: Average annual growth rate by sector, 1990-2009**



Maquilas, which are mostly involved in basic manufacturing and assembly, operate largely in free trade zones which are mostly isolated from many of the productivity issues that affect the rest of the tradables sector. In addition, maquilas receive incentives from the governments such as subsidies and tax breaks from the government. At least in part because of these incentives, maquilas have experienced a great deal of success as is shown in the graph above and in the graph on page 4, showing El Salvador's exports as a percentage of GDP with and without the maquila contribution.

Thus, the thriving sectors in El Salvador seem to be non-tradable services, basic agriculture products, basic manufactured goods with short supply chains, and maquilas which receive

incentives. All of these are either less affected by low productivity in tradables because they are non-tradables, have short supply chains that do not require high levels of productivity, or, in the case of maquilas, receive specific incentives and subsidies that allow them to circumvent the productivity problems of the tradables sector. These thriving sectors are clearly less intensive in the low productivity of the tradables sector constraint, which supports the idea that this is a binding constraint to growth in El Salvador.

## **Conclusion**

The tests employed by the growth diagnostics methodology indicate that the low productivity of the tradables sector is a binding constraint to growth in El Salvador. The shadow price is high, measured by productivity differences and the level of exports as a percent of GDP versus comparator countries. This shadow price reflects “missing exports” of 8.13 percent of GDP. Movements of the constraint, in this case represented by movements in exports as a percent of GDP and total factor productivity, correlate strongly with movements in GDP per capita. The fact that FDI flows in El Salvador are significantly concentrated in non-tradable areas, far more so than average for Latin America, shows that investors are trying to bypass the constraint. Lastly, the economic sectors that are thriving are either less intensive in the constraint because they are non-tradable or have shorter supply chains, or they are aided in circumventing the constraint through free-trade zones, subsidies and tax breaks. Based on this information, we conclude that low productivity of the tradables sector is a binding constraint to growth in El Salvador.

## **Further Study**

Because this is a binding constraint to growth, it merits a brief discussion of potential underlying factors. We have seen evidence that tradables, particularly exports, are lagging in El Salvador. From macroeconomic theory, the lack of being able to sell goods on the competitive global market can be generally understood by price factors and productivity factors.

Price factors are those issues which create a distortion between the marginal cost of producing goods and services and their price on the world market. Generally these factors include issues related to the capital account, monetary policy, and tariff and trade barriers; together these factors indicate the degree of effective protection a country’s tradable firms may enjoy. For El Salvador, price factors are largely exogenous—that is they are effectively neither changeable nor part of the feasible choice set of the government of El Salvador, as seen by closer examination. The capital account increases with the tremendous amount of remittances coming into the country. These remittances, as well as emigration, lead eventually to higher costs of labor, land, etc., resulting in an outflow of resources from the tradables into the non-tradables sector. On monetary policy, the fixed exchange rate regime removes potential devaluation levers which

might temporarily make Salvadoran exports relatively more competitive.<sup>42</sup> Finally, El Salvador's protection by way of tariffs and trade barriers is also quite low, as El Salvador and virtually all of its major trade partners are cosignatories to regional trade agreements (CAFTA-DR, NAFTA). In short, El Salvador's tradables sector faces very little favorable price distortion: The Salvadoran tradables sector is fully exposed to world prices. El Salvador's effective level of protection is low and is effectively not changeable. Moreover, even if they could be changed, artificially reducing the price of Salvadoran exports so as to compete on world markets would only a second best (and short-lived) option (Rodrik, 2008). Far better, then, to focus on first-best solutions: improving competitiveness through non-price factors (productivity).

Improving the productivity of the tradables sector in El Salvador is the first-best and realistically only solution to achieve the competitiveness in exports needed for El Salvador to enjoy broad-based economic growth. The main factors contributing to productivity are logistics & transportation, financial capital, human capital, and physical capital. As an initial diagnostic of these factors, later in this chapter we see that the transportation system in El Salvador is shown to be by-and-large in good shape, while more study is required to understand the logistical stance of El Salvador vis-à-vis competitor nations. Chapter 4 described financial capital as being sufficient, at least for large firms. For small and medium firms, there is some indication of a problem although more information is needed. In the section on human capital (Chapter 5.B.b), we see that while schooling is not likely a constraint for the domestic market, El Salvador's education is clearly not competitive with the rest of the world. Importantly, compared to global averages in math and science capability this problem begins as early as the fourth grade and shows no relative improvement by eighth grade. These data, combined with anecdotal data that English language skills are in high demand but short supply, indicate that El Salvador lacks training aimed at the labor market, and needs to improve learning (as opposed to merely enrollment, attendance, or literacy) beginning in the lower grades as preparation for learning the required skills in post-secondary training. We do not have much information to date on physical capital productivity, though we point out that those exporters who are able to survive in El Salvador, namely the maquilas, are more intensive in physical than human capital, perhaps indicating that physical capital use is (currently) less constraining.

The determination of exactly what is constraining productivity of the tradables sector requires more study and discussion. As mentioned in the introduction of this section, we are interested in the missing firms in exports; consequently we want to identify the productivity-related barriers to entry for export firms. A subsequent diagnostic could and should further explore the above listed factors contributing to productivity, especially human and physical capital. Further study would do well to closely examine the non-maquila, non-traditional export firms with a relatively high PRODY in El Salvador to understand how they have been able to survive, what inhibits them from realizing their growth potential, and how the country can encourage more such firms.

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<sup>42</sup> It is worth underscoring, though, that the fixed exchange rate regime also provides inherent stability by removing inflation fears.

Policy formulation would also benefit from understanding why maquilas outside of apparel did not survive. Finally, a study of successful export-led growth countries which face similar levels of exposure to world prices as El Salvador could help in understanding how exports and productivity can be increased even in such austere conditions.

## B. Low Social Returns

If potential returns are high but firms do not invest, it may be because social returns are low, meaning the country lacks key publicly provided complements. These complements—human capital and infrastructure—are usually publicly provided because they produce positive externalities, or resolve coordination failures. Geography is also sometimes included in this branch of the HRV tree.

### a. Infrastructure

This report looks at infrastructure with respect to telecommunications, electricity, transportation, and water.

#### *Telecommunications*

El Salvador has a telecommunications infrastructure with the following services: land lines, mobile phones and broad band internet. Communications with foreign countries are considered adequate in terms of price and quality. The waiting time for a telephone connection have become shorter, and currently a land line is installed in less than 72 hours. Mobile phone connections are issued on the spot.

**Table 5.64: Number of Cell Phones per 100 inhabitants**

| Country/Region                  | 2007   | 2008   |
|---------------------------------|--------|--------|
| East Asia and the Pacific       | 42.03  | 52.87  |
| Euro Zone                       | 116.15 | 121.87 |
| European Union                  | 115.67 | 122.20 |
| High Income                     | 101.29 | 106.34 |
| Latin America and the Caribbean | 67.47  | 80.33  |
| Low and Middle Income           | 41.03  | 51.74  |
| Low Income                      | 15.10  | 22.01  |
| Lower-Middle Income             | 36.31  | 47.22  |
| OECD                            | 95.53  | 99.95  |
| World                           | 51.12  | 60.84  |
| Chile                           | 83.88  | 88.05  |
| Dominican Republic              | 56.18  | 72.45  |
| El Salvador                     | 100.50 | 113.32 |
| Guatemala                       | 89.10  | 109.22 |
| Honduras                        | 58.33  | 84.86  |
| Nicaragua                       | 44.72  | 54.84  |
| United States                   | 87.21  | 88.87  |
| Uruguay                         | 90.39  | 105.21 |
| Costa Rica                      | 33.83  | 41.75  |

Source: World Bank Database

**Table 5.65: Fixed broadband internet subscribers per 100 inhabitants**

| Country/Region                  | 2007  | 2008  |
|---------------------------------|-------|-------|
| East Asia and the Pacific       | 3.68  | 4.63  |
| Eurozone                        | 21.34 | 23.96 |
| European Union                  | 20.25 | 22.94 |
| High Income                     | 21.82 | 23.61 |
| Latin America and the Caribbean | 3.54  | 4.88  |
| Low and Middle Income           | 2.04  | 2.71  |
| Low Income                      | 0.02  | 0.03  |
| Lower-Middle Income             | 2.02  | 2.59  |
| OECD                            | 19.91 | 21.76 |
| World                           | 5.36  | 6.21  |
| Chile                           | 7.83  | 8.49  |
| Costa Rica                      | 2.41  | 2.38  |
| Dominican Republic              | 1.57  | 2.27  |
| El Salvador                     | 1.47  | 2.01  |
| Guatemala                       | 0.43  | 0.58  |
| Honduras                        | -     | -     |
| Nicaragua                       | 0.49  | 0.64  |
| United States                   | 23.28 | 24.02 |
| Uruguay                         | 7.33  | 7.33  |

Source: World Bank Database

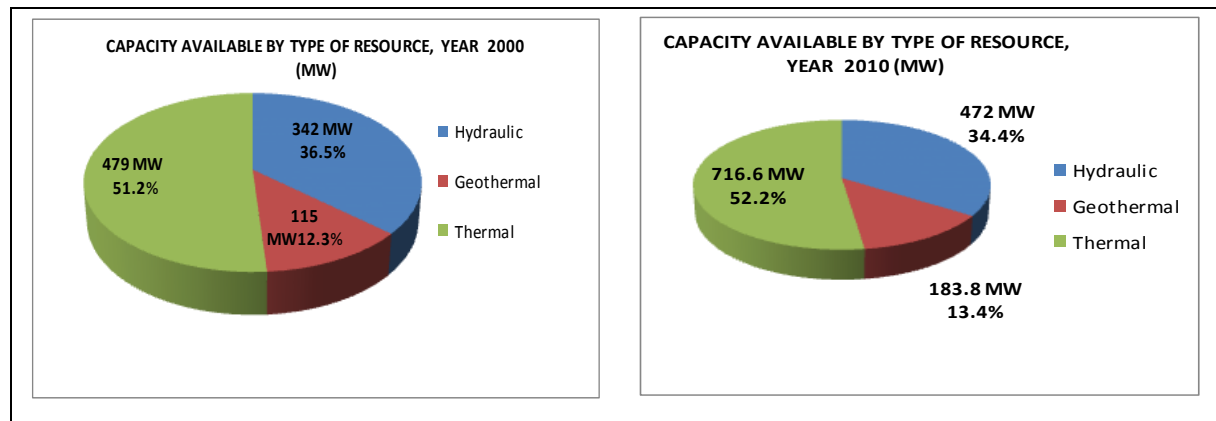
Approximately 10 percent of the Salvadoran population has access to internet. The wireless telecommunication network covers more than 95 percent of Salvadoran territory. Prices for national, international and internet services are competitive. Telecommunications infrastructure is not considered a constraint on private investment.

### *Electricity*

Power in the country is produced through hydraulic, geothermal and thermal resources. The energy generation system, which forms part of the wholesale market, consists of is made up by the Comisión Ejecutiva Hidroeléctrica del Río Lempa (CEL), which operates four hydroelectric power stations; LaGeo, operates two geothermal power stations; DukeEnergy International, NejapaPowerCompany, Cemento de El Salvador, Inversiones Energéticas, Textufil, GECSA, Energía Borealis, and HILCASA Energy, who are in charge of thermal energy and 3 Sugar Mills which generate energy using bagasse.

El Salvador's available generation capacity in 2000 was 936 MW and in 2010 the generation capacity was 1,373 MW, of which 52 percent corresponds to thermal capacity, 13 percent to geothermal and 34 percent to hydraulic capacity (See Figure 5.66).

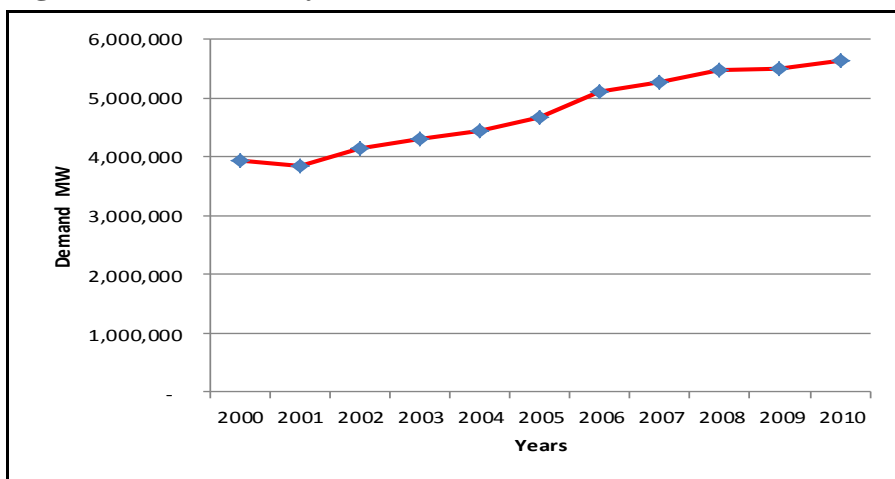
**Figure 5.66: Available Capacity by Type of Resources for 2000 and 2010 (Mw)**



Source: SIGET

Electricity demand increased by 43.4 percent during 2010, reaching 5,636,884 MW (Figure 5.67).

**Figure 5.67: Electricity Demand, 2000-2010**

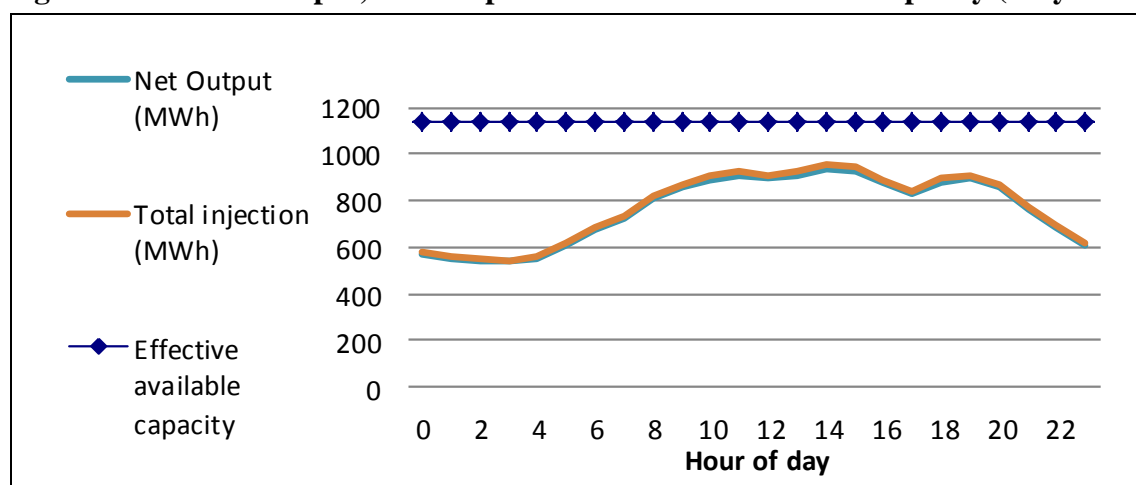


Source: SIGET

Demand for year 2010 peaked on March 16, 2010 approaching available capacity; the difference between total output and net output also provides some notion of the distribution loss factor (see Figure 5.68).



**Figure 5.68: Total Output, Net Output and Effective Available Capacity (May 16 2010)**



Source: Unidad de Transacciones de Electricidad (UTE)

### Transmission

The responsibility of the expansion and maintenance of the energy transmission system in El Salvador lies with the *Empresa Transmisora de El Salvador, S.A. de C.V. (ETESAL)*. These responsibilities include the connection lines with Guatemala and Honduras. In December 2009, the transmission system was comprised of 37 lines of 115 KV, with a length of 1023.59 Km., 24 power substations and two 230KV lines that interconnect with the transmission system of El Salvador, Guatemala and Honduras.

It is important to note that the transmission system in the northern zone of the country does not have the same capacity as the central and southern zones of the country and therefore energy supply is deficient there.

### Distribution

There are five power distribution companies: Grupo AES El Salvador; Del Sur, S.A de C.V., EDESAL, B&D Servicios Técnicos and ABRUZZO. The AES El Salvador group is composed of the following companies: CAESS, AES-CLESA, EEO and DEUSEM.

Total electricity sales for 2010 were 4,466,030 MWH, distributed among 1,485,140 clients. 74 percent of the sales and 78 percent of the users were served by the AES El Salvador group.

### Energy Prices

In order to compare rates across countries in the region, this study uses the average rates for the industrial sector which correspond to the relevant effective rates from the main distributors responsible for the service to the capital cities, not including taxes. The rates for the industrial sector are fairly similar in El Salvador, Costa Rica and Panama; Guatemala has the most expensive rates in the region (see Fig. 5.68).

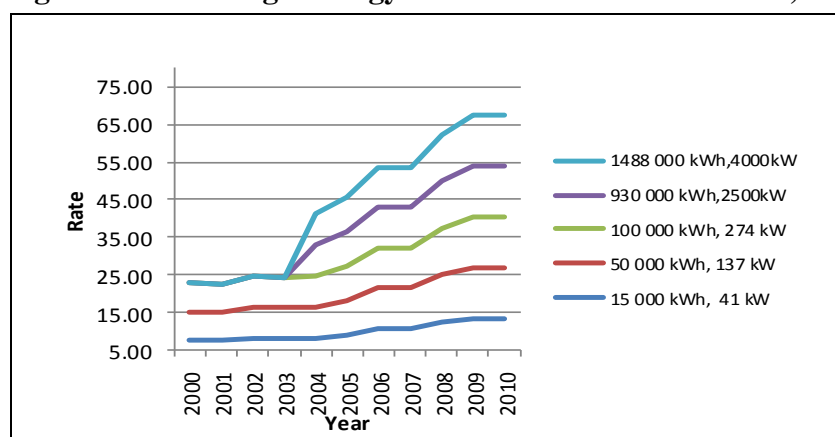
**Figure 5.69: Effective Rates For Industry—June 30 2010 (in US dollar cents/KWH)**

|                        | Costa Rica<br>ICE | El Salvador<br>CAESS | Guatemala<br>EEGSA | Honduras<br>ENEE | Nicaragua<br>DN y DS | Panamá<br>ELEKTRA |
|------------------------|-------------------|----------------------|--------------------|------------------|----------------------|-------------------|
| <b>INDUSTRIAL</b>      |                   |                      |                    |                  |                      |                   |
| 15,000 KWh, 41 KW      | 16.40             | <b>16.17</b>         | 27.41              | 20.86            | 20.79                | 21.24             |
| 50,000 KWh, 137 KW     | 16.41             | <b>16.66</b>         | 21.48              | 20.85            | 20.80                | 16.98             |
| 100,000 KWh, 274 KW    | 16.41             | <b>16.65</b>         | 21.39              | 14.82            | 20.85                | 16.98             |
| 930,000 KWh, 2500 KW   | 12.85             | <b>16.62</b>         | 21.27              | 14.43            | 18.60                | 15.67             |
| 1,488,000 KWh, 4000 KW | 12.85             | <b>16.62</b>         | 21.27              | 14.43            | 18.60                | 15.67             |

Source: ECLAC

Electricity rates for the industrial sector have trended upwards for the period between 2000 and 2010. The below graph shows this trend using effective rates for December of each year.

**Figure 5.70: Average Energy Prices For Industrial Sector, 2000-2010 (ctvs of \$/kwh)**

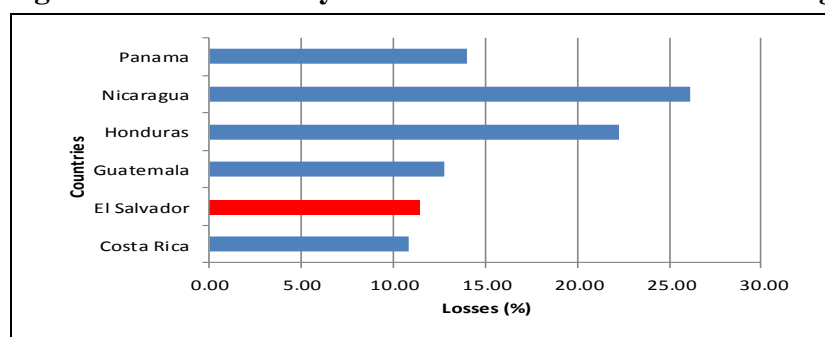


Source: Instituto Costarricense de Electricidad

The losses at the transmission and distribution levels are important rough measurements of efficiency of the energy sector. During 2009, El Salvador lost 11.5 percent of its energy supply due to transmission and distribution losses. This was the second lowest rate of transmission and distribution loss in the Central American region. Costa Rica had the lowest rate of loss at 10.8 percent (see Fig. 5.70).

It is worth noting that El Salvador's transmission and distribution losses were 11 percent in 2000, and that rate was maintained throughout the decade, dropping only slightly to 11.5 percent in 2009. It is also worth noting that the region as a whole has higher rates of transmission and distribution loss than other regions.

**Figure 5.71: Electricity Losses in the Central American Region**



Source: ECLAC

### *Quality of Service*

Measuring the quality of service of the distribution system can be done using a series of indicators that measure the basic quality of the service, quality of the supplied product and the quality of the commercial service. Measurements are taken for each category and for each one of the energy distribution companies, which are then compiled into a weighted average based on the number of clients served in the country for the whole country.

The following indicators measure the quality of the supply or technical service provided. This mainly relates to service disruptions, or, in other words, power outages:

**SAIDI:** This measures the average duration of a service disruption in terms of hours per user of the system per year.

**SAIFI:** This measures the average number of service disruptions in terms of the number of disruptions per user of the system per year.

**FMIK:** This measures the mean service disruption frequency in terms of kilovolts amperes (kVA).

**TTIK:** This measures the total service disruption time in terms of kilovolts amperes (kVA).

According to the General Superintendent of Electricity and Telecommunications (SIGET based on its initials in Spanish), which regulates the electricity system in El Salvador, these service quality indicators show that the electricity distribution system does not meet the minimum requirements they set out. The indicators should be below the limits specified in the below graph, but all of the weighted averages exceed their indicated limits.

**Figure 5.72: Annual SAIDI, SAIFI, FMIK And TTIK Indicators**

|              | Urban/Rural      | Indicator    | 2005         | 2006         | 2007         | 2008         | 2009         | 2010         |
|--------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| URBAN        | Average Measure  | SAIDI        | 19.87        | 20.96        | 20.28        | 17.44        | 17.95        | 15.80        |
| <b>Limit</b> | <b>Indicator</b> | <b>SAIDI</b> | <b>18.00</b> | <b>18.00</b> | <b>18.00</b> | <b>14.00</b> | <b>14.00</b> | <b>14.00</b> |
|              | Average Measure  | SAIFI        | 14.84        | 13.17        | 12.16        | 10.31        | 10.17        | 9.47         |
| <b>Limit</b> | <b>Indicator</b> | <b>SAIFI</b> | <b>9.00</b>  | <b>9.00</b>  | <b>9.00</b>  | <b>7.00</b>  | <b>7.00</b>  | <b>7.00</b>  |
|              | Average Measure  | FMIK         | 13.84        | 12.39        | 11.20        | 9.28         | 9.15         | 8.02         |
| <b>Limit</b> | <b>Indicator</b> | <b>FMIK</b>  | <b>8.00</b>  | <b>8.00</b>  | <b>8.00</b>  | <b>5.00</b>  | <b>5.00</b>  | <b>5.00</b>  |
|              | Average Measure  | TTIK         | 18.42        | 18.07        | 17.77        | 14.91        | 14.99        | 12.05        |
| <b>Limit</b> | <b>Indicator</b> | <b>TTIK</b>  | <b>14.00</b> | <b>14.00</b> | <b>14.00</b> | <b>10.00</b> | <b>10.00</b> | <b>10.00</b> |

Source: SIGET

While the previous indicators measured the quality of the supply from a service perspective, other indicators measure quality of the product more directly. These indicators measure the levels of tension in the system and disturbances of the voltage wave. Another indicator is FEBnoper, which measures the amount of electricity delivered at frequencies outside of the levels established by SIGET. This indicator, expressed as a percentage of total energy delivered, provides a measurement of the energy quality energy in terms of voltage. The limit established by SIGET between 2005 and 2007 was five percent, for 2008-2009, three percent and for 2010, five percent. Until 2008, the standard was not met, but during 2009 and 2010 the electricity quality met requirements, at least as established by SIGET and measured by FEBnoper (see Table 5.73).

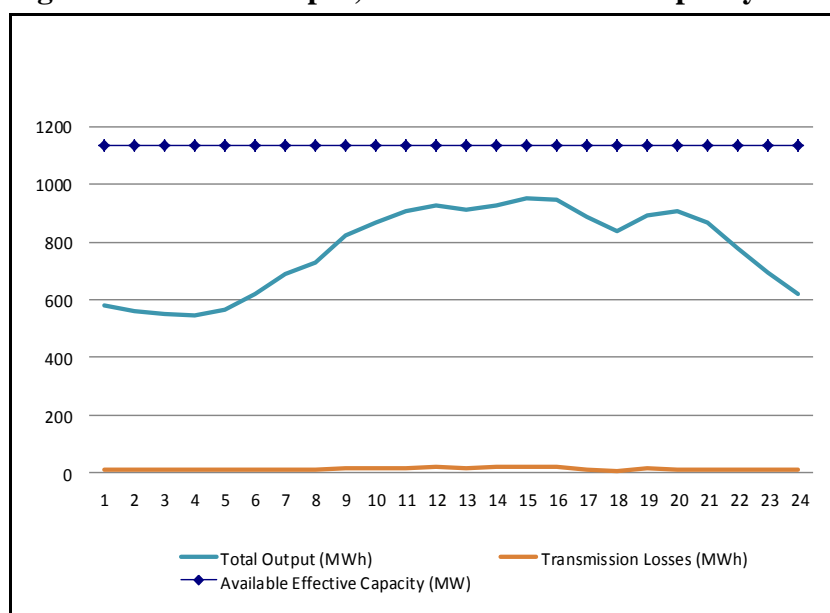
**Table 5.73: Indicator FEB noper**

| Zone    | Concept      | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|---------|--------------|-------|-------|-------|-------|-------|-------|
| Global* | Med. Average | 8.00% | 6.49% | 5.61% | 3.29% | 2.49% | 2.89% |

\*Includes Urban and Rural

Source: SIGET.

**Figure 5.74: Total output, Available Effective Capacity and Transmission Losses**

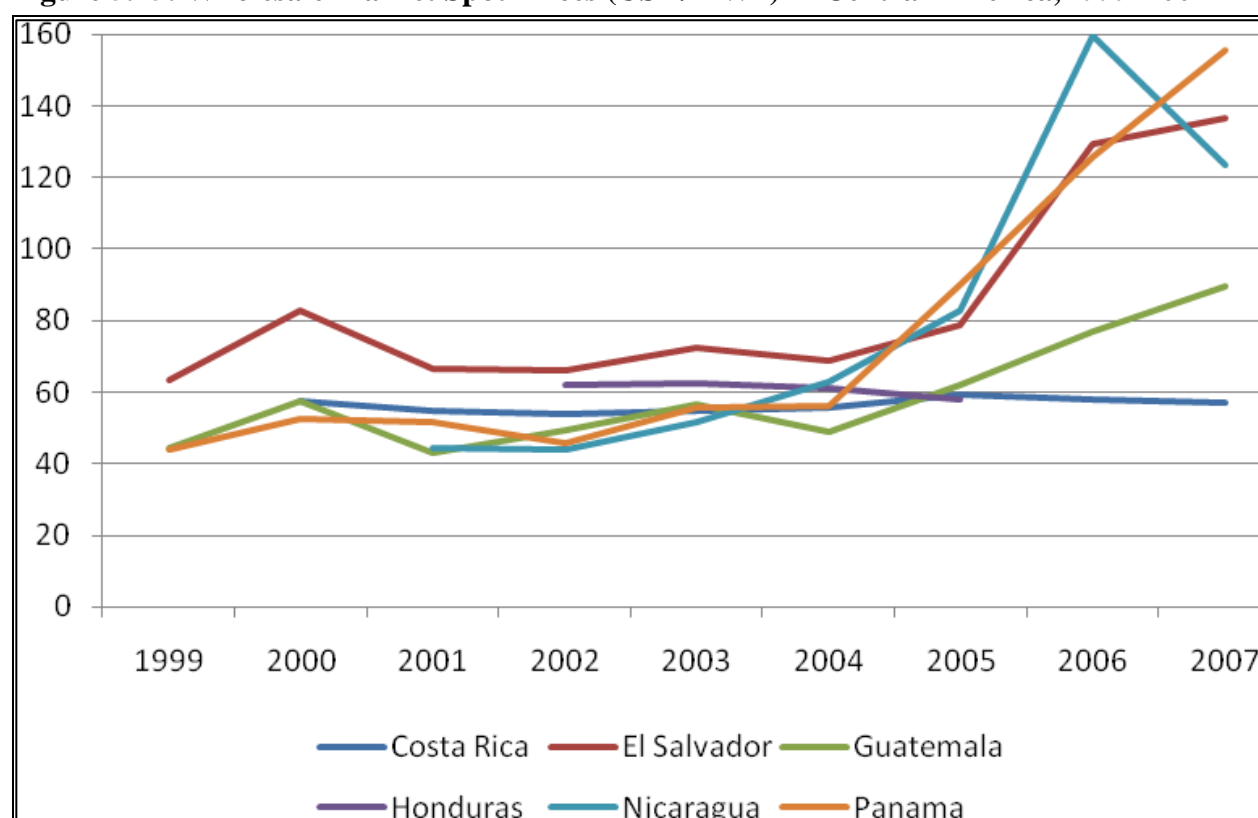


Based on the current installed capacity and the current demand for electricity in El Salvador, it does not appear that access to electric energy infrastructure is a major constraint on investment. However, a group of sector representatives<sup>43</sup> did express that if no investment is made in the energy generation sector in four years, then demand will exceed installed available capacity in the next four years. This is even the case if we assume that the El Chaparral dam will be operating by that time, as is expected. In the event that installed capacity does not keep pace with demand, there could be interruptions of the energy supply. This has not occurred for roughly 20 years, when energy blackouts used to last up to 8 hours per day, affecting productivity throughout the economy.

In addition to the circumstances described above, it is important to keep in mind that 50 percent of the generation capacity in El Salvador comes from carbon-based energy production, which have coal and oil as key inputs. Given the price fluctuations that these energy sources have experienced over the past several years, and the impact that has on the price of energy, it will probably be important to investigate other sources of energy generation in the future. Looking at the spot prices for energy in El Salvador shows that these prices have risen significantly over the past eight years, and they are already high relative to other countries in the region, thus further accentuating El Salvador's energy vulnerability due to its use of carbon-based energy production.

<sup>43</sup> Meeting held with the representatives of the energy sector at the Central Reserve Bank on April 15th, 2011

**Figure 5.75: Wholesale Market Spot Prices (USD/MWh) in Central America, 1999-2007**



Source: (USAID 2010)

The energy sector's representatives also expressed some reservations about the SIEPAC project, an effort throughout the region to integrate energy generation and distribution, saying that it may be limited in its ability to serve as an energy supply alternative, since the SIEPAC all of the member countries are seen as having limited capacity to offer energy to the grid.

Energy supply could become a binding constraint for the development of investments in the medium term if the generation capacity is not addressed in a timely manner and if the possibility of hydrologic stress is not taken into account, which could affect the adequacy of the energy supply given how critical hydroelectric generation is in the energy production process of El Salvador.

## Water

Water, besides being indispensable for life, performs two crucial functions for the development of the country. It constitutes a strategic input for the residential, commercial, industrial, hydroelectric, tourism, and agricultural sectors, among others; and more specifically, access to potable water and sewerage as it contributes to improve the productivity of companies and people and in turn, improves competitiveness. It represents a critical renewable resource (FUSADES 2007).

According to FAO (2007), between 1961 and 2003, irrigated agricultural lands in El Salvador increased from 15,000 to 45,000 hectares (World Bank, 2006). The potable water supply directed towards important sectors of the country and economy, such as industry, commerce, households, central and autonomous government entities as well as municipalities increased from 184.2 million cubic meters in 1990, to 343.6 million cubic meters in 2005. The annual average growth rate was 4 percent for the period.

Water is also important for energy generation in El Salvador. Between 1985 and 2006, hydroelectric energy generation comprised 23 percent of the total electricity generation in El Salvador. However, the annual rate of growth for energy generation was greater for fossil fuels than for renewable sources including hydroelectric generation.

Adequate access to potable water and sewerage services has strong links to the improvement of the productivity labor and businesses as well. Adequate access to water reduces costs and expands market opportunities for companies, therefore increasing productivity and entrepreneurial competitiveness (Komives 2005).

### *Access to Water*

Access to potable water and adequate sewerage also contributes to poverty reduction through direct effects on health and education improvements. The lack of good quality water is one of the major causes of disease in developing countries and generates costs related to death, malnutrition, rickets and the low productivity caused by these diseases. Lack of or inadequate access to these services also affects educational quality and access, as students may have to dedicate time to the collection of water or cause them to miss classes due to illness, preventing students from attending school, especially girls..

El Salvador, due to its geographic location and climate conditions, possesses a natural supply of water that is adequate to satisfy demand from different sectors. According to the National Territorial Studies Services (*SNET* in Spanish) the average annual rainfall is approximately 1,784 mm of rain. This represents 56,052 million m<sup>3</sup> of water that falls on Salvadoran territory each year. Of this annual rainfall, nearly 59 percent goes back into the atmosphere due to water evaporation and water transpiration. The remaining 41 percent becomes mostly surface water, with a smaller percentage of it becoming ground water.

Nonetheless, the origin of the water supply is somewhat concentrated. the Lempa River basin, the largest collection and distribution point of natural water in El Salvador. This is where the main hydroelectric plants are located: (Guajoyo, Cerrón Grande, 5 de Noviembre and 15 de Septiembre, with a joint installed capacity for 2006 of 460.3 MW, 37 percent of the total) and projected plants. There are also main irrigation points coming out of the Lempa River basin (Atiococho, Zapotitán and Lempa-Acahuapa), as well as the three sources of water for the Metropolitan area of San Salvador.

Another problem that impacts the availability of water resources in El Salvador is the lack of rainwater absorptive capacity in the soil. This is critical because aside from maintaining necessary humidity in the ground, the soil feeds water into the aquifer during the rainy season and the rivers and lakes during the dry season through the flow of underground water. The low absorptive capacity of the soil causes rain water to spread along the surface (runoff waters), causing a series of problems during the rainy season including an excess of water, floods, soil erosion processes, and increasing sedimentation of the dams, among others. During the dry season, the recharge of rivers and lakes may be insufficient as a result of soil problems, affecting the physical availability of surface water bodies.

The water availability problem is not due to scarcity, but to the interruption of the water cycle and deterioration of the quality of the resource due mainly to inadequate institutionalization and management.

### *Quality of the Water*

One factor that affects water quality as well as economic competitiveness and citizen well-being is river contamination. The main sources of contamination of the surface and underground water bodies of the country is waste from the residential, industrial, agro-industrial, and agricultural sectors; particularly the release of sewage waters into rivers adjacent to the main urban centers of the country, without prior treatment. USAID, PAHO and CARE in 1993; WHO in 2000, ECLAC and PNUMA in 2002 and ANDA in 2005 all pointed out severe deficiencies regarding the treatment of sewage waters and that approximately only 2 percent - 3 percent of the generated sewage water received some type of treatment before disposal into rivers (Dimas 2006).

According to SNET, only 20 percent of the surface water can be used to make water potable using conventional methods. Despite the adequate supply of water and a dense network of surface water bodies, the results of the SNET diagnosis shows the delicate state of the water supply in El Salvador. Of the 114 sites that were assessed, 24 percent of the water is recommendable for irrigation. The country does not have water that can be classified as “excellent”. 65 percent of the sites present “regular” quality water (there is a limitation for the development of aquatic life); 17 percent of surface water is “good” and 33 percent cannot be used to develop any type of aquatic life. Only 14 percent of the rivers of the country can develop recreational activities without risk to human health.

**Table 5.76: Water Availability**

|   |                                      |
|---|--------------------------------------|
| Availability of water per inhabitant  | 1,732 mt <sup>3</sup> per inhabitant |
| Water not good for irrigation, Lempa River  | 88%                                  |
| Water not good for turning potable, through conventional methods from Lempa River | 90%                                  |
| Availability of water considered <b>excellent</b> for                             | 0%                                   |



|  |     |
|--|-----|
| human consumption  |     |
| Availability of water considered <b>good</b> for human consumption | 2%  |
| Availability of water considered regular                           | 65% |
| Availability of water considered poor                              | 33% |

The main sources of contamination of the surface and underground water bodies of the country are waste from residential, industrial and agricultural areas, particularly the release of sewage waters into the adjacent rivers of the main urban centers of the country, as they do not have any prior treatment.

### **Use and Administration of Water**

Although the nature and severity of the problems differ from country to country, the main cause for the “scarcity” of water (whether physical or decrease of quality) is due to deficient use and management of the resource, and not to a physical scarcity (Saleth and Dinar 2004).

The institutional structure dedicated to water management in El Salvador is fragmented, creating perverse incentives which impede the efficient use of the resource, as well as its conservation and protection. One of the main reasons for institutional failures associated with use, development and management of water, is that the current institutional structure has not been able to provide universal access to potable water and sewage services to the population, particularly in the rural areas. One important reason for this is the weak financial management of most of the potable water services provided, due in part to weak tariff rate policies and direct subsidies. Furthermore, the World Bank pointed out in 2004 that only 22 percent of the total amount of the water subsidy reached the poorest households of the country, showing that the subsidy may be misallocated, if its intention is to reduce costs for the poorest households.

This financial weakness becomes evident when looking at an analysis of the annual invoicing revenues versus the annual expenditures of ANDA, the National Administrator of Aqueducts and Sewers. Between 1990 and 2005, invoicing revenues were unable to exceed the expenditures. Covering this shortfall has, on average, represented 69 percent of the annual expenditures of the institution during the referred period. In view of this situation, ANDA may need to transfer from the public sector in order to meet its obligations.

Another institutional fault may be reflected in the pricing structure of ANDA. Fees for potable water per cubic meter are fixed for certain quantities of consumption; namely, between 1 and 10 cubic meters and 11 to 20 cubic meters per month. Someone consuming between 1 and 10 cubic meters per month pays a flat fee of \$2.29, so a residential ANDA customer who consumes 1 cubic meter of water per month pays \$2.29 for that cubic meter, while someone who consumes 10 cubic meters of water per month will pay \$0.23 per cubic meter, not including the sewage system. For users consuming between 11 and 20 cubic meters of water per month, prices

decrease further from \$0.21 per cubic meter to \$0.11 per cubic meter. Prices per cubic meter do begin to increase after 20 cubic meters of consumption, but the pricing structure for water consumption under 20 cubic meters per month may create a perverse incentive where “those who consume less pay more and those who consume more, pay less”. Since nearly 60 percent of ANDA users consume 20 cubic meters per month or less, this incentive structure may be seriously skewed.

The institutional environment and management of water resources are worse in El Salvador because the institution does not have a modern law to regulate it. Similarly, there is no law that regulates the potable water and sewerage sub-sector with clear rules of the game to protect and make use of the resource, as well as the rights and obligations of all of the parties involved. A transparent and autonomous regulating entity would help to resolve this problem. This would allow the enforcement of the law, promote the culture of paying for water usage when sectors and households are capable of paying, help better focus the water subsidy, aid in the implementation of a national program to decontaminate water through economic incentives and help establish public-private partnerships, among benefits.

Despite the strategic importance that water resources have for economic growth as a strategic input for entrepreneurial competitiveness and for human development, during the past thirty years El Salvador has faced a severe crisis associated with the availability of this resource. The crisis has several dimensions: physical scarcity of the resource due to the decreasing capacity to absorb water in the territory in part due to changes in the hydrological cycle (quantitative dimension); decrease in the quality of water due to weak or nonexistent urban and rural processes to decontaminate surface and underground water (qualitative dimension) and inefficient use, development and administration of the resource (institutional dimension).

Although it is true that currently water availability and access does not present a constraint for the development of investment activities, the situation in the future could devolve if the urgent attention is not paid to the treatment, care and quality of the water. If El Salvador’s water resources come under stress, access to water and the population’s health will become very complicated. The hydroelectric dams use rain water and if this is reduced, there will be difficulties in getting adequate energy supply.

## Transportation Infrastructure

El Salvador's transportation infrastructure includes a road network, the Port of Acajutla, which is fully operational, and the Port of La Unión, which was built two years ago and it is not yet in operation, the El Salvador International Airport (AIES), and the Ilopango Airport. The Ilopango Airport hosts national civil and military aviation operations, and an inoperative and deteriorated railroad system.

Institutionally, the Ministry of Public Works, Transport, Housing and Urban Development (*MOPTVDU* in Spanish) is responsible for policies and planning for the sector, as well as for construction of the national road infrastructure. The Road Maintenance Fund maintains the national road network, and the Comisión Ejecutiva Portuaria Autónoma (CEPA) is responsible for development of port infrastructure not subject to special regimes, which is the framework for the Ports of Acajutla and La Unión, and AIES. CEPA administers the national railroad infrastructure by State mandate and financial backing, but is not state-owned. CEPA is an autonomous institution affiliated with MOPTVDU.

The national road network has 10,886 km of roads, of which 26 percent are paved. The density in square kilometers is 0.52; by international standards, this is an acceptable level. In Central America, only Costa Rica has a density higher than 0.62. The road network is in good condition, resulting from good maintenance; however, there are stretches of roads with deficient design, probably due to nearby urban growth, which generates added transport costs and hampers competitiveness.

**Figure 5.77: Map of secondary dirt roads and their service areas (2 km on each side)**



**Figure 5.78: Map of paved roads and their service area (2 km on each side)**



The density of the road network indicates that the level of connectivity is adequate, particularly considering the size of the territory - 21,000 km<sup>2</sup> – with a maximum length of 315 km and maximum width of 90 km. Distances and traveling times represent a comparative advantage for production.

Foreign trade follows the following routes: towards Central America, by land; by sea, trade uses the ports located both on the Pacific and Atlantic Oceans. On the Pacific side, the ports of Acajutla are used for El Salvador and Port Quetzal for Guatemala; the Port of La Unión is to enter operations in the near term. The other route is through the Atlantic using Port Barrios in Guatemala, and to a lesser degree Port Cortés in Honduras. By air, trade uses the El Salvador International Airport (AIES). The railroad is not in use.

Of the two ports that the country has for international maritime trade, only the Port of Acajutla is operating. Acajutla is a multi-purpose maritime terminal, specialized in handling bulk products. It is built on open waters, based on jetties, which decreases efficiency of the port's operations and increases maintenance costs. The port has increased the total amount of cargo it moves from 2.5 million metric tons in 2000 to 3.2 million metric tons in 2005, and 3.7 million metric tons in 2010. The volume of cargo containers has stayed the same at 1.1 million containers per year. During the past decade, the port has improved operating efficiency significantly, going from 69 hours average per vessel in 2000 to an average 30 hours/vessel/year during 2008 to 2010 (CEPA). A new report by the IFC indicates that the Acajutla port has a lower cost of container services per container, and comparable total charges per container and per TEU, as seen below.

**Figure 5.79: Comparison of costs at ports**

| Indicator / Port           | Acajutla | Quetzal  | Cortes   |
|----------------------------|----------|----------|----------|
| Container Services Per Box | \$145.71 | \$172.01 | \$146.80 |
| Total Charges per Box      | \$182.20 | \$196.83 | \$180.48 |
| Total Charges per TEU      | \$109.32 | \$118.10 | \$108.29 |

It is important to highlight how import and export operations are carried out. According to shipping agents, shipping companies and exporters in El Salvador, the economic agent in charge of the transaction hires a shipping company, which in turn determines the cost of transportation services from the point of production to the point of final destination. The shipping company includes the following in these fees: payment of land transportation from the port of shipment, tariffs for use of port facilities, ocean transportation, tariffs for the use of port facilities during unloading, and land transportation to final destination.

Consequently, the shipping company decides the port of shipping or loading and the port of unloading. The payment is independent from the ports that are to be used. In other words, the shipping companies charge a similar amount if the final destination port is Acajutla or Quetzal in the case of the Pacific, and it works similarly for ports operating on the Atlantic side.

The costs of transportation from and to the Port of Acajutla towards other destinations have historically been considered high when compared to ocean transportation costs for similar distances for other regions. This is attributed to the fact that the country itself does not produce a sufficient volume of cargo to make the unitary costs competitive. Under this framework, the records at the Port of Acajutla establish that the costs /TEU imported from Rotterdam, Miami, Shanghai, and Los Angeles, on average are USD 4,150, 3,538, 2,905, and 3,476 respectively. The TEU exported to those destinations has an average cost of USD 3,462, 3,245, 2,270, and 2,719, respectively.

The Port of Acajutla is a natural competitor with Port Quetzal, located in the Republic of Guatemala on the Pacific Ocean some 50km away. In 2010, Port Quetzal handled some 6.7 million MT, 78 percent higher for the same year for Port of Acajutla. This explains in part why the number of vessels that arrived at Port Quetzal during that year (1,319) exceeded by 131 percent the number of vessels that used Acajutla during the same year.

The basic construction for the Port of La Unión was finalized in April 2008. It is a multi-purpose ocean terminal specializing in container traffic. The terminal has not yet entered into operation, and will require additional investment in infrastructure and port equipment to do so. According to the loan agreement signed with the Japanese government for its construction, operations of the port were to be granted as a concession to a private entity specialized in managing and handling ports. This entity must invest in equipment, warehousing facilities, etc. The Port is a third-generation terminal which has 3 docking stations, 240, 220 and 360m in length, 9.5, 14 and 15m in depth, respectively, and able to handle specialized vessels of up to 4,800 TEU.

**Table 5.80: Distances from San Salvador to Ports**

| <b>Distances from San Salvador to ports that use El Salvador for their ocean trade</b> |                |                |           |
|--|----------------|----------------|-----------|
| <b>Ocean</b>   | <b>Country</b> | <b>Port</b>    | <b>Km</b> |
| ATLANTIC   | GUATEMALA      | Puerto Barrios | 623       |
|  |                | Santo Tomás    | 623       |
|  | HONDURAS       | Puerto Cortés  | 417       |
| PACIFIC  | GUATEMALA      | Quetzal        | 269       |
|  | EL SALVADOR    | Acajutla       | 84        |
|  |                | La Unión       | 200       |

The distances from San Salvador, the main center of origin and destination for ocean trade, to ports on the Pacific are not significant enough to make an impact on the freight price. A similar situation is true for ports located on the Atlantic. The shipping companies establish single tariffs for ports on the Pacific, and other tariffs for any port on the Atlantic.

Regarding air transportation infrastructure and the competitiveness of international trade by air, the main problem of AIES is saturation of the cargo terminal's capacity. Since it began operations in 1980, it has established a constructed area of approximately 11,000 square meters, with limited facilities to handle approximately 30,000 metric tons per year of import and export merchandise. The terminal has space to park three cargo planes. With development of AIES over time, the cargo terminal currently handles some 20 metric tons per year, amounts that have decreased since 2005. Approximately 30 metric tons per year were handled between 2000 and 2004. The construction of a new cargo terminal for the El Salvador International Airport requires that the construction, administration and operations be handled by a private, world-class operator. However, this requires it to be a project with plans for turning it into a regional consolidation and distribution center for air cargo, and requires installation and operation of an efficient single window for customer services.

**Table 5.81: Landing Fees**

| SERVICES  | 2010 Data in USD |           |          |           |            |         |         |
|---|------------------|-----------|----------|-----------|------------|---------|---------|
|   | EL SALVADOR      | GUATEMALA | HONDURAS | NICARAGUA | COSTA RICA | PANAMA  | BELIZE  |
| EQUIVALENT LANDING FEES/MT                      | \$ 4.00          | \$ 4.96   | \$ 4.89  | \$ 6.44   | \$ 4.93    | \$ 5.05 | \$ 4.30 |
| Average payment at regional level : USD 4.94/MT |                  |           |          |           |            |         |         |

Of the main airports located in the Central American region, AIES has the lowest landing fees. On the other hand, Ilopango Airport is not considered a feasible facility for developing an international cargo terminal, due to the fact that the runway can only accommodate aircraft no heavier than 12,500 lbs (5,675 kg). The railroad is not used for cargo operations.

El Salvador's current infrastructure for trade is adequate, and does not constrain moving of the current volumes of cargo. It is important to highlight that the Port of La Unión needs to begin operations and that the El Salvador International Airport needs to have an adequate cargo area.

In Table 5.70, El Salvador holds the seventh position within the IPIAI ranking of 12 Latin American countries that were compared for this purpose. This position is attributed to results that do not compare well in the indices: legal framework, government attitude towards private participation, political risk, access to information, private investment record in infrastructure, and macroeconomic environment. The country holds second place in two of the indicators: regulatory efficiency and financial Markets, just one position below Chile, which occupies first place in Latin America.

The position related to financial markets is attributed to the low interest rate on loans (7.5 percent) – the third lowest in the region, as well as the new long-term credit conditions and the growth of pension funds, which in 2007 were 17 percent of GDP, a figure higher than for any other country of the region. On the legal framework index, El Salvador is also placed in third position, below Chile and Paraguay; and fifth for efficiency of the judicial system for conflict resolution. Another one of the strengths of the country is its low political risk.

The indicators selected and compared in 2007 by WEF in 12 Latin American countries, allow for interpretation of the environment for private investment in Latin America, and it confirms that in general, the countries have experienced important advances. Chile has experienced great advances. In the case of El Salvador, there are factors not measured by the IPIAI which deter investment, such as the need to increase the level of technical and engineering education of Salvadorans, and the need for more effective prevention and control of factors that promote organized crime in general. Salvadoran infrastructure, especially for air transport, is among the best in Latin America. El Salvador needs to work on transparency and adopt strategies that will allow the infrastructure projects to generate adequate social benefits.

**Table 5.82: Index of Investment Opportunities in Infrastructure**

| <b>(Indicators that guide choosing policies that will improve the attraction of private investment in infrastructure, and prioritize sectors and measures)</b> |                   |               |              |                    |                  |                 |                  |               |             |               |                |
|--|-------------------|---------------|--------------|--------------------|------------------|-----------------|------------------|---------------|-------------|---------------|----------------|
| <b>Indexes</b>   | <b>Costa Rica</b> | <b>Brazil</b> | <b>Chile</b> | <b>El Salvador</b> | <b>Guatemala</b> | <b>Honduras</b> | <b>Nicaragua</b> | <b>Panamá</b> | <b>Peru</b> | <b>DomRep</b> | <b>Uruguay</b> |
| Total quality index for infrastructure   | NA                | 4.4           | 1.4          | 2.5                | 4.2              | NA              | NA               | NA            | 5.5         | 3.8           | 5.5            |
| Specific factors for investing in infrastructure   |                   | 4.3           | 5.3          | 3.6                | 3.5              |                 |                  |               | 4.3         | 2.7           | 4.3            |
| Macroeconomic conditions   |                   | 4.0           | 5.6          | 5.0                | 4.0              |                 |                  |               | 4.7         | 3.5           | 4.7            |
| Legal framework  |                   | 2.9           | 4.5          | 3.8                | 3.5              |                 |                  |               | 3.3         | 3.1           | 3.3            |
| Regulatory efficiency  |                   | 3.6           | 5.0          | 4.0                | 4.0              |                 |                  |               | 3.7         | 3.6           | 3.6            |
| Public ethics  |                   | 2.6           | 4.6          | 3.9                | 3.1              |                 |                  |               | 3.1         | 2.4           | 4.3            |
| Effectiveness of dispute resolution procedures   |                   | 2.6           | 3.9          | 3.5                | 3.5              |                 |                  |               | 3.2         | 3.2           | 5.0            |
| Political risk   |                   | 5.4           | 6.8          | 5.3                | 4.0              |                 |                  |               | 4.8         | 5.0           | 5.3            |
| Financial market instruments   |                   | 3.8           | 4.9          | 3.8                | 2.4              |                 |                  |               | 3.6         | 1.5           | 2.3            |
| Access to information  |                   | 5.4           | 5.6          | 4.1                | 3.9              |                 |                  |               | 4.0         | 4.3           | 4.0            |
| Private investment record for infrastructure   |                   | 4.6<br>0      | 5.3<br>0     | 3.6<br>0           | 4.40             |                 |                  |               | 4.8<br>0    | 2.0<br>0      | 3.0<br>0       |
| Ability to Pay   |                   | 4.5           | 5.3          | 2.4                | 3                |                 |                  |               | 2.9         | 3.1           | 4.8            |
| Government attitude towards private investment   |                   | 4.5           | 5.5          | 4.6                | 4.0              |                 |                  |               | 5.8         | 4.2           | 4.8            |
| Roads  |                   | 5.1           | 3.2          | 3.3                | 3.5              |                 |                  |               | 4.7         | 3.0           | 4.1            |
| Ports  |                   | 3.8           | 0.1          | 1.1                | 2.3              |                 |                  |               | 2.9         | 2.2           | 1.1            |
| Air transportation   |                   | 2.9           | 1.9          | 1.4                | 4.0              |                 |                  |               | 4.4         | 3.6           | 3.9            |
| Electricity  |                   | 2.8           | 2.9          | 4.3                | 4.1              |                 |                  |               | 4.2         | 4.4           | 3.7            |
| Source: Prepared at the Technical Secretariat of El Salvador from data from WEF 2007<br>NA : Not available   |                   |               |              |                    |                  |                 |                  |               |             |               |                |



## **b. Human Capital**

In addition to reasons of lack of required complimentary infrastructure, firms may find returns to investment low because of a lack of human resources with the required skill set, either because they are too expensive (the result of low supply coupled with high demand resulting in a high price or wage) or they are simply not available. In exploring the outlook for human capital in El Salvador, we examine separately the issues of education, (the formation and demand for human capital) and health (as a potential obstacle for the use and accumulation of human capital).

### *Education*

As illustrated in the following section, El Salvador's current human capital situation can be characterized as an equilibrium of relatively low supply and low demand for human capital, resulting in the observed relatively low quantity (stock) and price (wage) of education in the country. At the same time, because the Salvadoran and US labor markets seem to be relatively highly integrated, allowing human capital to move to its most productive use, Salvadorans with higher human capital often move to the US (itself evidence of both low domestic demand for human capital as well as potential personal safety concerns). These symptoms of low supply and low domestic demand curves coupled with the higher rate of migration among the educated compared to the less educated, may constitute something of a low equilibrium trap in the domestic accumulation of human capital. So long as domestic demand for human capital is low, it cannot be considered a binding constraint in the current economic landscape. Because the Salvadoran and US labor markets are sufficiently well-linked that effectively all migrants who arrive in the US are able to find work of some form (though not necessarily in fully using their El Salvador-credentialed training), with an average wage higher than what they were earning at home<sup>44</sup> and the higher returns in that market, attempts to increase human capital supply without increasing domestic demand are unlikely to be particularly successful in the face of the higher demand for Salvadoran labor from the US labor market.

### *Education Supply—Quantity*

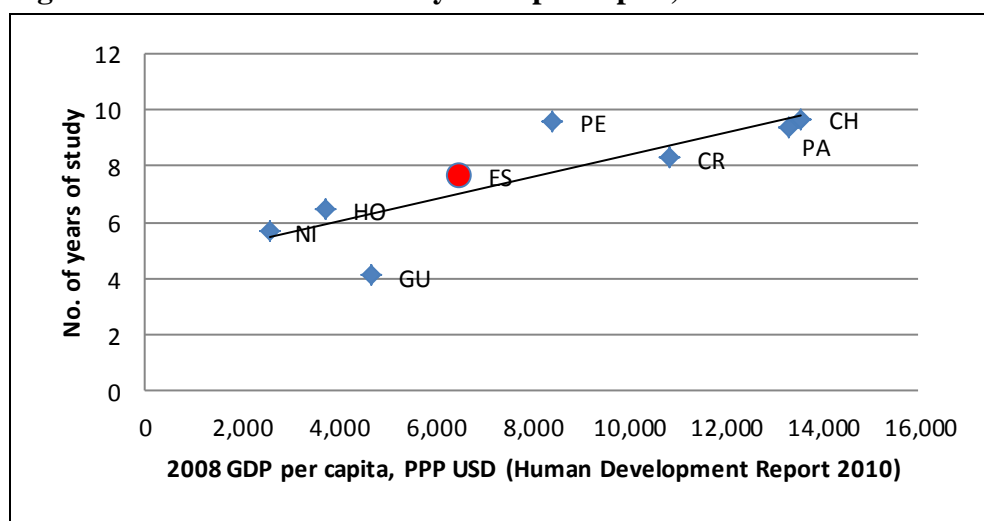
The supply of education to meet market demand can be examined in both the country's quantity and quality of education.

In El Salvador the quantity of education supply is middling to low compared to other countries in the region. Figure 5.82 below shows that the 7.7 years of average education in El Salvador falls between the higher income, better educated countries of Chile, Panama, and Costa Rica and the lower income, less-well educated countries of Honduras, Nicaragua, and Guatemala—though it is clearly closer to the latter. And while El Salvador does not have the impressive level of education for income level that Peru enjoys, it does fall just above the regional trendline, indicating that its education level is typical for a Latin American country of its income.

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<sup>44</sup> See Clemens, Montenegro, and Pritchett (2008)

**Figure 5.83: Education Stock by GDP per capita, 2010**



Source: UNESCO, WDI

More alarming is both the high number of people that have never attended school and the relatively low number with post-secondary education. As UNESCO 2007/2008 data in Table 1 show, one quarter of Salvadorans over age 24 have never attended school. This is the second-highest rate of being unschooled among comparator countries, and woefully worse than the 4 leaders by nearly 15 percentage points. At the other end of the education spectrum, only 6 percent of El Salvador's population has had any post-secondary schooling, placing them just above Guatemala and Honduras and nearly 10 percentage points behind Chile.

**Table 5.84: Highest Level of Schooling Attained**

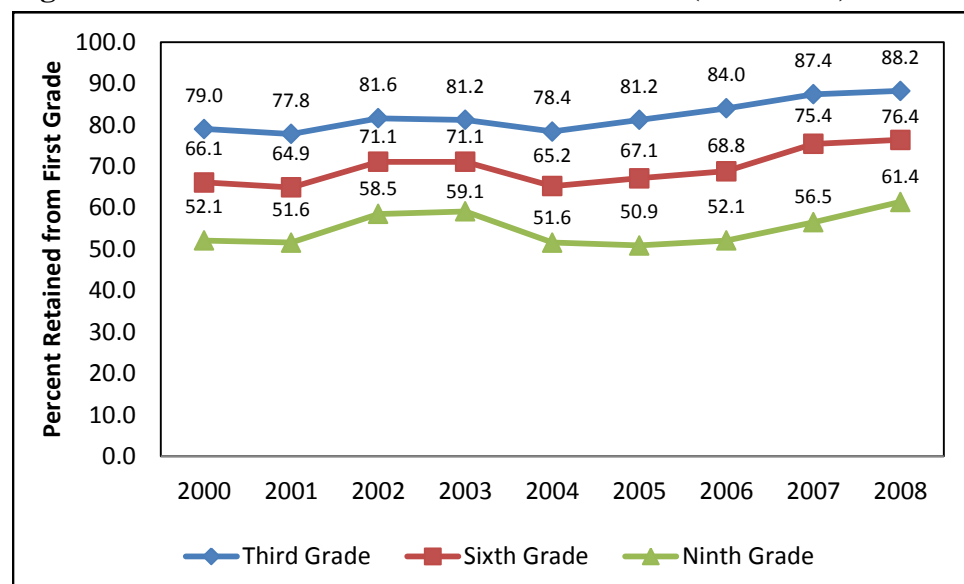
| Highest Level of Schooling | No schooling (%) | Primary (%) | Upper secondary (%) | Tertiary (%) |
|----------------------------|------------------|-------------|---------------------|--------------|
| El Salvador 2007           | 24.9             | 15.0        | 15.4                | 6.2          |
| Chile 2007                 | 4.1              | 25.1        | 35.3                | 15.0         |
| Costa Rica 2008            | 5.1              | 30.1        | 15.7                | 18.6         |
| Dominican Republic 2007    | 9.0              | 12.7        | 12.2                | 18.7         |
| Guatemala 2006             | 38.9             | 15.0        | 7.2                 | 3.4          |
| Honduras 2007              | 21.1             | 25.6        | 8.7                 | 4.2          |
| Peru 2008                  | 9.3              | 19.4        | 28.6                | 18.2         |

Source: UNESCO

Moreover, El Salvador's education system loses its students at a fairly high rate from year to year. Looking at 2008 data from the Ministry of Education, for every 100 students who enrolled in first grade, only 88 reached third grade, 76 reached second grade and 61 reached ninth grade. However, El Salvador has had considerable success over the last 3 years (2006-2008) in

increasing retention rates, particularly for ninth grade where the retention rate has increased nearly 10 percentage points.

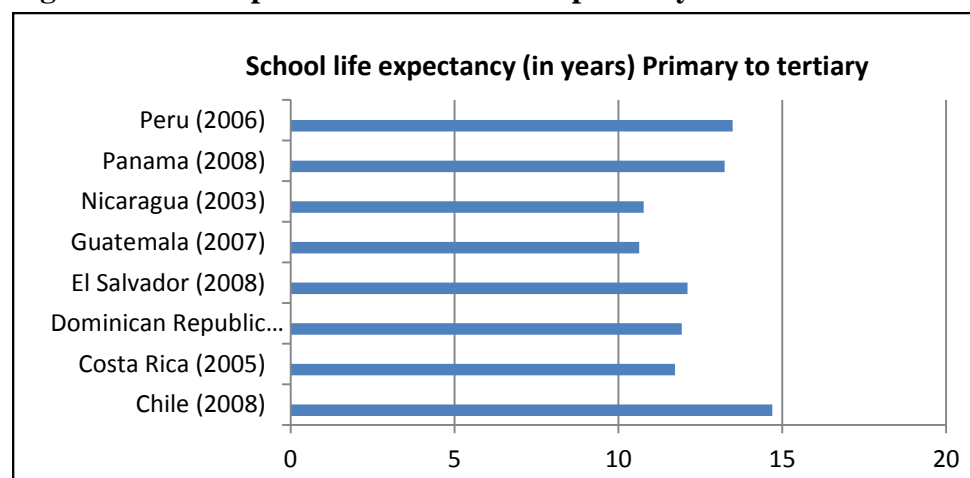
**Figure 5.85: Retention Rates for Basic Education (2000-2008)**



Source: El Salvador Ministry of Education. Statistics calculated using inter-annual enrollment rates from census data from 2000-2008.

El Salvador's recent efforts in improving education seem to be paying off, at least as far as increasing supply of educated workers. As seen in Figure 3, the UN now predicts that the average Salvadoran child can expect just over 12 years of education in their school career—higher than Costa Rica and the Dominican Republic (though still notably lower than Peru, Chile, and Panama). Though these are only predictions, there are encouraging.

**Figure 5.86: Comparative School Life Expectancy**



Source: <http://unstats.un.org/unsd/demographic/products/socind/education.htm>

Similarly, El Salvador has made advances in universal primary education, improving primary enrollment (first to sixth grades) from 76 percent in 1991 to 95 percent in 2008. For basic

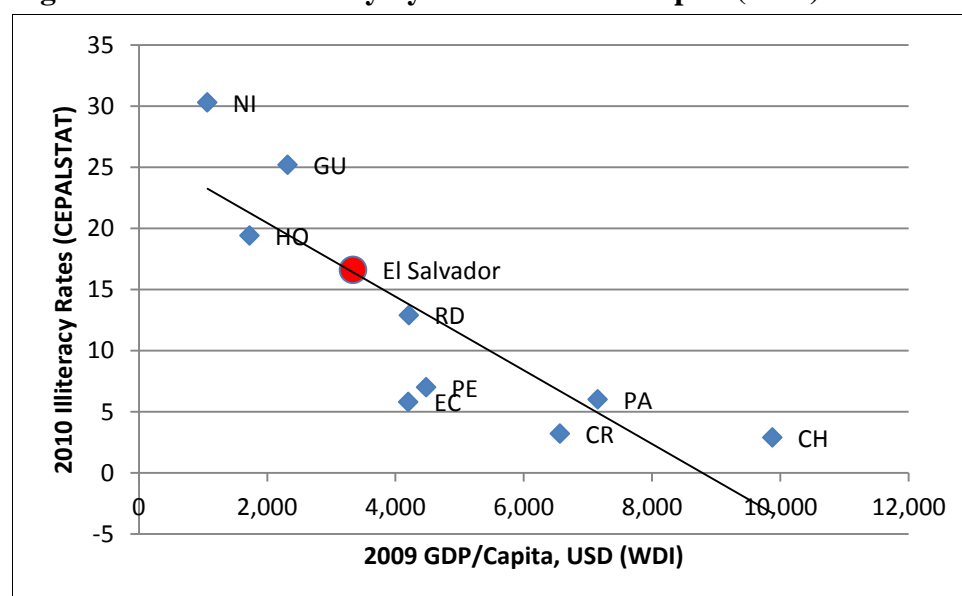
education (first to ninth grades), enrollment has increased from 84 percent in 2000 to 93 percent in 2008, with a gender equity index of 1.01. Yet once enrolled, student attendance is somewhat low. School attendance for those age 4 to 12 years is 83.4 percent, while the rate drops to 71.7 percent for those age 13 to 18 (El Salvador Ministry of Education). In spite of recent and projected progress in attainment and enrollment, attendance is still lagging, suggesting possible problems with education quality, other disincentives or “pull” factors.

### *Education Supply—Quality*

We have seen that the quantity of education supply is near the expected levels given Salvadoran income, but medium to low compared to the region as a whole. The quality of education is also a critical consideration in the labor supply.

Using illiteracy as a composite indicator of basic quantity and quality of education, we see that El Salvador’s illiteracy rates, though high at 15 percent, are at the level that would be expected given its income level (see Figure 5.86 below, which shows the trend line of expected illiteracy rates and income; El Salvador is right on the fitted trend line).

**Figure 5.87: 2010 Illiteracy by 2009 GDP Per Capita (USD)**



Source: CEPALSTAT and WDI

Despite this performance, it is important to note that El Salvador has made impressive progress in reducing illiteracy over the last 20 years. Most illiteracy is currently confined to older populations whose access to education suffered during the civil war (1980-1992). According to the 2007 census, among 15 to 24 year olds, illiteracy fell from 24 percent in 1992—the last year of the Civil War—to just 6 percent in 2007. Currently, one in four of those older than 34 years is illiterate, 43 percent of the population older than 60 years is illiterate, and half of those age 70 or older are illiterate. At the same time, among 10 to 18 year olds, only three of every 100 is illiterate. It is also worth noting that there are significant differences in literacy rates by locality

and gender, though the former seems to be slightly more salient, as shown in Table 5.87. Interestingly, gender trends in illiteracy are reversed by about the same share (4-5 percentage points) depending on locality—females are more likely to be illiterate in urban areas but males are more likely to be illiterate in rural areas. Males are four times more likely to be illiterate in rural areas, and a female in a rural area is twice as likely to be illiterate as her urban counterpart.

**Table 5.88: Illiteracy Rate by Subpopulation for ages 10+**

| Sub Population | Male  | Female |
|----------------|-------|--------|
| Overall (14%)  | 11.3% | 16.1%  |
| Urban          | 6%    | 10%    |
| Rural          | 25%   | 20%    |

*Source: Authors' own calculations from data from the Ministry of Education and the Technical Secretariat of El Salvador*

The student-teacher ratio in El Salvador is quite high, in both the primary and secondary grades, above the regional average in both instances. As seen in Table 5.88, El Salvador is tied for worst and is second worst, respectively, in these categories—and by a fair margin—despite being “only” fourth worst in the region in GDP per capita. To the degree that quality is correlated with the student-teacher ratio, this metric would seem to indicate a low level of educational quality for El Salvador.

**Table 5.89: LAC Student Teacher Ratio, 2008**

| Country/Region                  | Primary   | Secondary | 2009 GDP/capita |
|---------------------------------|-----------|-----------|-----------------|
| Latin America and the Caribbean | 23        | 25        | ...             |
| Nicaragua                       | 29        | 21        | 1069            |
| Honduras                        | 33        | 17        | 1727            |
| Guatemala                       | 29        | 17        | 2320            |
| <b>El Salvador</b>              | <b>33</b> | <b>26</b> | <b>3337</b>     |
| Ecuador                         | 23        | 15        | 4202            |
| Perú                            | 21        | 29        | 4477            |
| Dominican Republic              | 20        | 15        | 4637            |
| Costa Rica                      | 19        | 16        | 6564            |
| Panamá                          | 24        | ...       | 7155            |
| Uruguay                         | 15        | 16        | 9420            |
| Chile                           | 25        | 23        | 9877            |

*Source: CEPALSTAT*

Finally, the quality of education as benchmarked by an internationally administered achievement test shows El Salvador as among the lowest of those tested in the Trends in International

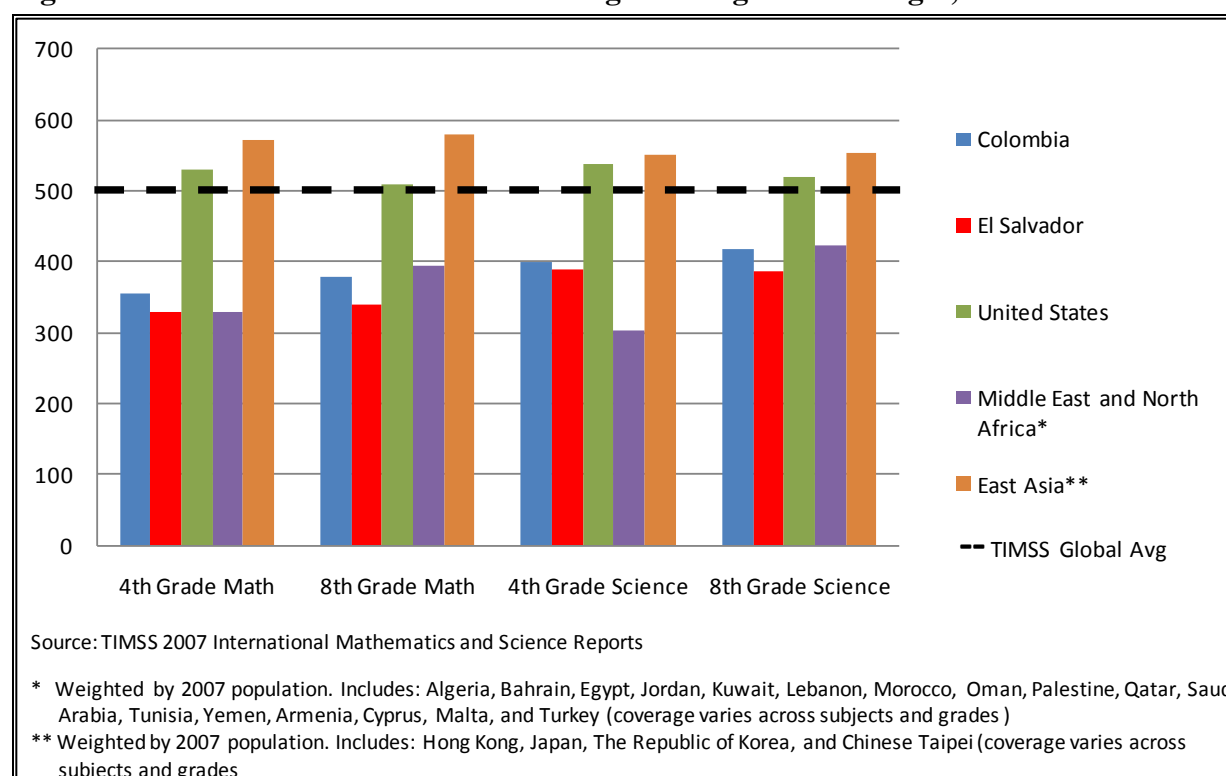
Mathematics and Science Study (TIMSS), though it should be noted that the test is given mostly to more developed countries. The test is scaled such that the world average is 500.

With a score of 330 in mathematics and 390 in sciences for fourth grade, El Salvador occupies 33<sup>rd</sup> place of 37 participating countries. This score places the country very close to Colombia (the only Latin American country which participated in the 2007 testing), Morocco, and Tunisia, and higher than Qatar and Yemen. Nineteen countries, all Asian and European, obtained a national average above the TIMSS international average.

El Salvador's eighth-grade scores, 340 for mathematics and 387 for sciences, ranked it 45 of 48 countries. Consistent with fourth grade trends, the top spots were occupied by Asian countries: China (Taiwan), South Korea, and Singapore, followed by Hong Kong SAR and Japan.

As seen in Figure 5.89 below, and as suggested above, Salvadoran fourth grade students are competitive or surpass those from the MENA region, but are surpassed by them in both math and sciences by the eighth grade. Moreover, El Salvador falls far below the United States, the destination of many of its migrants, as well as the East Asian economies, the current world leaders in education attainment.

**Figure 5.90: TIMSS Achievement Scores against Regional Averages, 2007**



The TIMSS test establishes four international benchmarks for performance levels, ranging from basic tasks (Low International Benchmark, score of 400) to very complicated tasks (Advanced

International Benchmark). El Salvador's national average is below the Low benchmark; virtually zero Salvadoran students reach the Advanced benchmark, only 1 percent reach the High mark, 6 percent reach the Intermediate mark, and 22 percent exceed the Low Benchmark, with the remainder falling below the Low mark. The fourth grade math average for El Salvador was well below the 10<sup>th</sup> percentile score globally; eighth grade was just over that mark. On the other extreme, Singapore and Hong Kong SAR see 41 and 40 percent of their students reach or exceed the Advanced level. El Salvador's learning is far from globally competitive.

In a more regional-specific study conducted by the United Nations Educational, Scientific and Cultural Organization (UNESCO), elementary students from throughout 16 different Latin American countries were tested on their mathematics, science, and reading skills (UNESCO's Second Regional Comparative and Explanatory Study) (2005). El Salvador's sixth graders scored below the regional mean in all three categories, and while the country's score gap between the top and bottom deciles was one of the lowest in the region, the gap between rural and urban schools was one of the largest. We also note that, consistent with regional trends, boys tended to do somewhat better on math and science tests while girls did better on reading skills. This implies that as a whole, Salvadoran schools have roughly the same (poor) quality, and that most of the variation that does exist reflects an urban-rural divide.

Thus, the evidence suggests that the quantity of El Salvador's human capital stock is middle to low, while the quality of education in El Salvador is low by regional standards and very low by global standards. Taken together, we conclude that El Salvador's human capital supply is low but that it reflects levels that are expected for its per capita GDP<sup>45</sup>.

### *Firms' Perceptions of Education in Productivity*

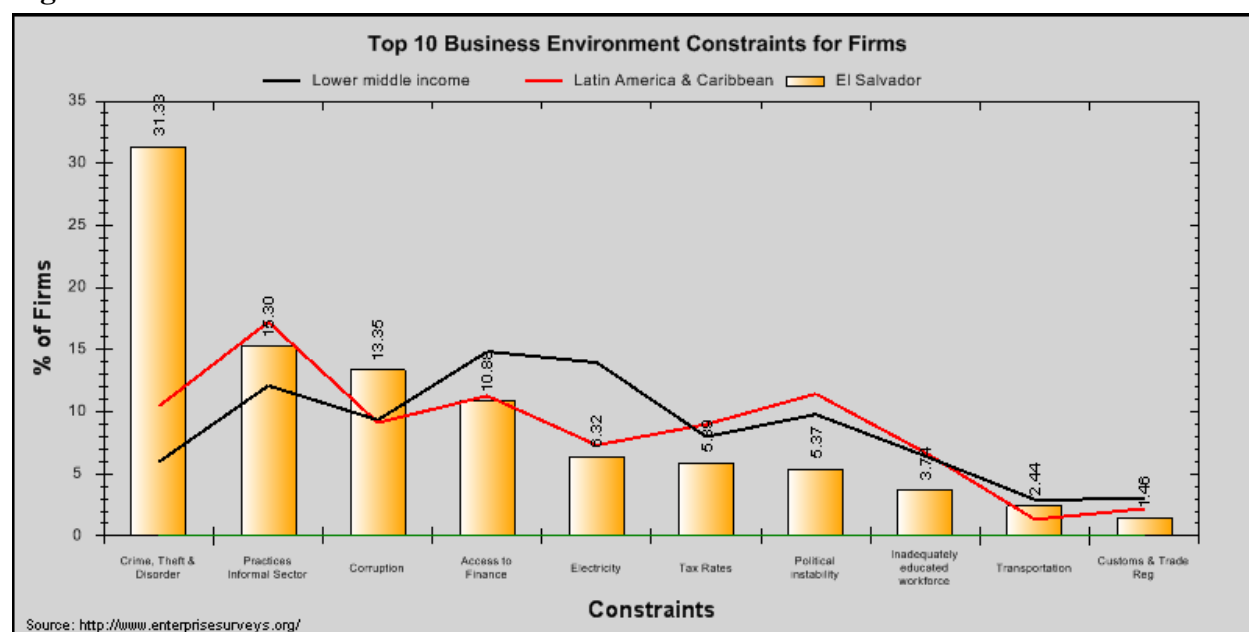
The 2006 World Bank Enterprise Surveys indicated that firms do not flag human capital as a major constraint to their operations<sup>46</sup>. In Figure 5.90, for example, of the 10 categories of potential constraints in El Salvador, only 3.74 percent of Salvadoran firms indicated that a lack of human capital is the most binding obstacle, ranking it a distant seventh—roughly the same ordinal ranking workforce education receives for the region. Obviously, El Salvador's firms' relative rankings of these constraints will change as higher level constraints, notably crime, are relaxed.

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<sup>45</sup> We are unable to how El Salvador relates to the rest of LAC because of the limited number of LAC countries in TIMSS

<sup>46</sup> Of course, these statistics are only valid for existing firms and thus, as with many firm-based analyses, there is a survivors' bias when evaluating constraints to investment. With data currently available, we are not able to determine reasons for choosing not to invest among firms that never started or chose to locate elsewhere.

**Figure 5.91: Constraints in El Salvador**



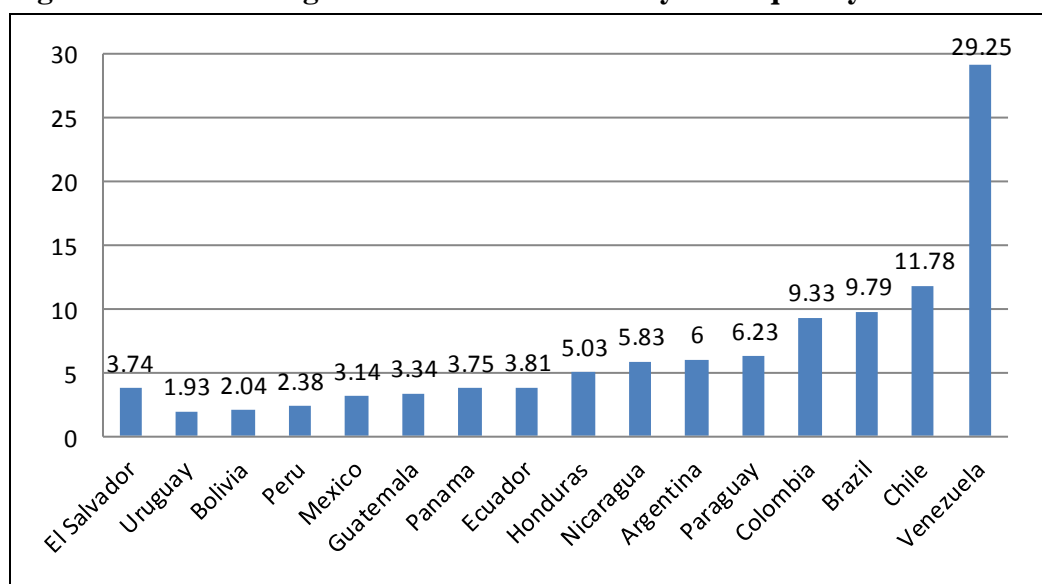
Next, we see in Figure 5.92 that regionally the share of firms constrained by an inadequately trained workforce in El Salvador is also very low—ranking 11<sup>th</sup> of 16, between Panama and Guatemala.

It is worth noting that other reports indicate that a significant share (20-30 percent) of firms have “trouble finding sufficiently well-qualified employees.”<sup>47</sup> In our consultations with business groups, when we asked what issues most inhibited their growth and investment, none mentioned having a qualified workforce as being among their top issues. Only when prompted by the specific question of whether they had trouble filling positions or whether they thought education was up to their requirements did we receive comments indicating difficulty in this regard. Roughly a quarter to a third of attending firms affirmed that finding the right people could be difficult. These firms almost uniformly mentioned English language abilities as the principle skill required most difficult to find. Some also mentioned a lack of technological training.

<sup>47</sup> See for example “Informe de Desarrollo Económico y Social 2003; Competitividad para el Desarrollo, Capítulo 6” by Salvadoran think tank Fusades, and recent USAID report “El Salvador Employability Survey Executive Summary,” 26 May 2010. Sampling methodology of these reports is unclear, while the statistics from the Enterprise Surveys are nationally representative.



**Figure 5.92: Percentage of Firms Constrained by Inadequately Trained Workforce**



Source: WB Enterprise Surveys (2006)

The Enterprise Surveys also reports that of the major industries in El Salvador, the two industries most likely to mention labor skill level as a binding constraint are Food Products and Beverages (26.2 percent) and Retail (21.8 percent)—neither of which seem terribly human capital intensive at face value, though the demand in the retail sector may be alluding to English language proficiency, a theme which we did hear relatively often in focus groups with Salvadoran firms and business associations.

**Figure 5.93: Percentage of Firms Identifying Labor Skill Level as a Major Constraint**

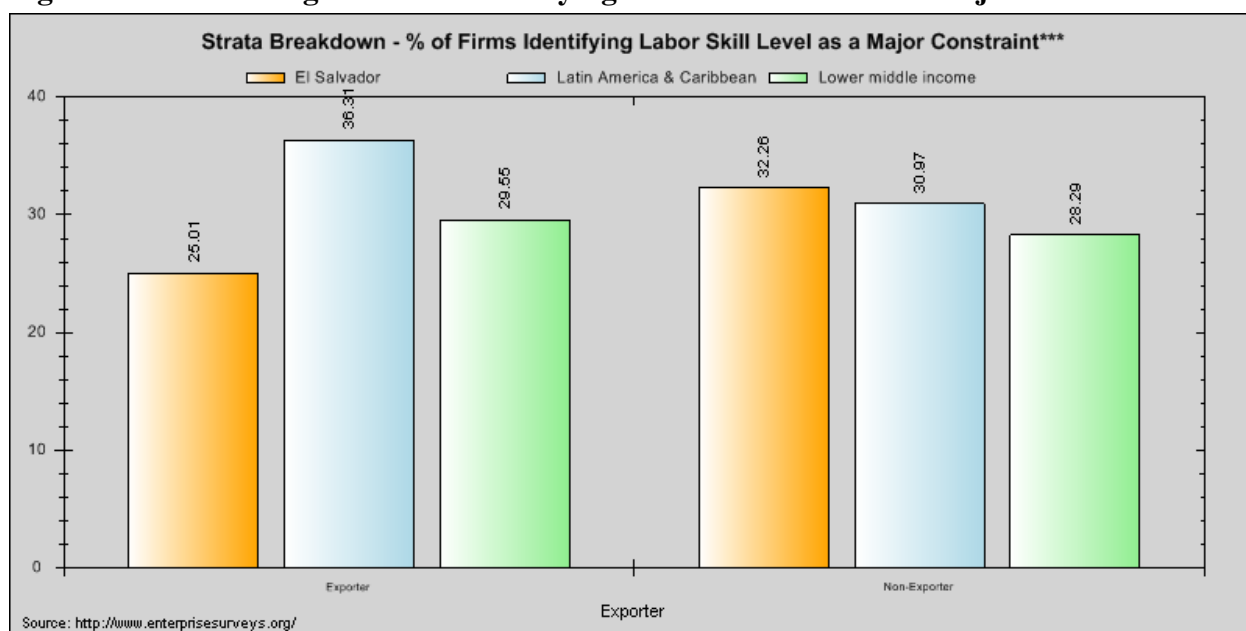


Figure 5.92 illustrates that a firm which identifies low labor skill level as a constraint is much more likely to be a non-exporting than an exporting firm, in sharp contrast to regional and income peers. As a share of firms constrained by human capital, far fewer are exporters as compared to LAC and Lower Middle Income countries, and vice versa for non-exporters. Obviously before undertaking an investment, firms will research the availability of key inputs. The fact that exporters are less constrained by education considerations is indicative that El Salvador's exports are labor-intensive but not human capital-intensive, a fact underscored by looking at the palette of the country's exports (see Table 5.93).

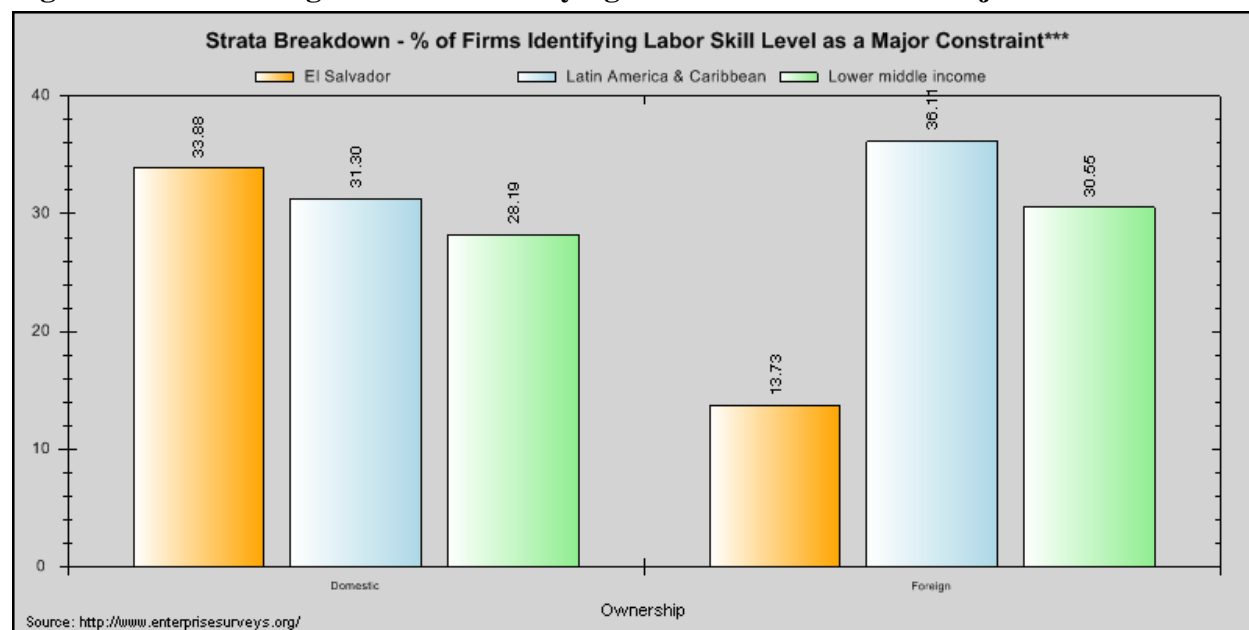
**Table 5.94: Exports in 2009**

- Maquila - \$1,487 million, 40 percent of total exports
- Coffee – \$230 million, 10 percent of total exports
- Prepared drugs - \$98 million, 4 percent of total exports
- Toilet paper - \$97 million, 4% of total.
- Sugar - \$88 million, 3.8 percent of total exports
- Boxes, bottles and other plastic packing- \$85 million
- Steel, iron and other manufactures - \$121 million
- Water, mineral, w/gas, sweetened - \$79 million
- Ethanol - \$74 million
- Underwear and clothing complements - \$67 million
- Other food products - \$63 million

Source: US Embassy San Salvador Calculations

Moreover, as shown in Figure 5.94, when human capital is an issue, it is domestic firms, far more than their foreign-owned counterparts, which complain about a low labor skill level as a major constraint to investment.

**Figure 5.95: Percentage of Firms Identifying Labor Skill Level as a Major Constraint**



Of course, this data has a self-selection problem in that the Enterprise Surveys only interview firms which made the decision to invest and which survive. Ideally we would like to address this bias with information on firms which decided not to invest and ask them why they decided against it. Anecdotally, the current top four categories of questions that potential investors asked the US Commerce Department in the US Embassy in El Salvador are crime and security, energy/electricity, political stability, and human capital—particularly if the firm requires a large or skilled labor force. Companies that require nonskilled labor (like maquilas) are happy with the human capital here. Call centers, or companies requiring more skilled labor, encounter a shortage of English speakers and a relatively small skilled labor force. A more rigorous evaluation of the investment decision would likely return interesting results.

### *Returns to Education and Market Demand*

If firms' investment or expansion is constrained by the lack of sufficiently well-trained human capital, then firms should be competing for that human capital, driving up wage rates and making education more valuable.

Evidence from Mincer regressions from 2009 data (DIGESTYC calculations) indicate that overall returns to education for the population age 16-65 are positive with an 8.5-percent increase in wages for each year of schooling. But this general result has been declining in the last few years: Estimates from 2000 indicate returns of 9.2 percent and 2005 data indicates returns of 8.6 percent. However, these results are significantly lower than the regional average of 12 percent (Psacharopoulos and Patrinos 2002). All else equal, this suggests that while education is valued, the level of demand in El Salvador is less than that of its neighbors and competitors.

We further explore schooling returns by examining returns of an additional year of education within specific levels of education<sup>48</sup>, by gender, and by age for the entire population for the youngest who could have completed some tertiary. The results from the 54 individual Mincer regressions in Table 5.95 indicate that as with the overall results, returns to education seem to be falling in general over the last decade. Also, among those with a tertiary education, an additional year of tertiary education saw a higher percent increase in wage than an additional year of primary (or secondary) education did among those for whom primary (or secondary) education was their highest level of education reached. Consequently we see that the market is not willing to pay much more to a primary or secondary-school educated person with an additional year of that level of education, but it is willing to pay more for a tertiary educated person with an additional year of tertiary education. Whether this is a schooling effect or a signalling effect is unknown, but it seems to follow that an additional year of primary or secondary schooling had less impact on wages at the primary and secondary levels. Finally, we note that returns seem to be decreasing over time in primary and secondary education, while returns to tertiary education

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<sup>48</sup> Meaning, we assess the percent increase in wage returns to an additional year of education of a particular level, using as the sample only those who completed no more than that level's maximum years of education. Primary is grades 1-8, secondary is grades 9-11, and tertiary is over 11.

over this time dips between 2000 and 2005 and recovers somewhat by 2009. Somewhat surprisingly, returns for the younger cohort does not seem to differ markedly from returns for the entire population.

**Table 5.96: Mincer Returns to Education**

| Returns to an Additional Year of Schooling,<br>By Age, Gender and Level     |   |         |      |      |           |      |      |          |       |       |
|---|---|---------|------|------|-----------|------|------|----------|-------|-------|
| All coefficients<br>significant at the<br>5% level except<br>those in gray. |   | Primary |      |      | Secondary |      |      | Tertiary |       |       |
|   |   | 2000    | 2005 | 2009 | 2000      | 2005 | 2009 | 2000     | 2005  | 2009  |
| Ages<br>16-65   | T | 8.1%    | 4.8% | 4.4% | 6.4%      | 5.7% | 4.4% | 16.3%    | 13.9% | 15.5% |
|   | F | 7.7%    | 3.6% | 3.6% | 11.9%     | 7.4% | 7.6% | 17.8%    | 15.1% | 17.1% |
|   | M | 7.9%    | 5.5% | 4.9% | 4.5%      | 6.9% | 4.0% | 15.2%    | 13.2% | 14.6% |
| Ages<br>20-34   | T | 7.5%    | 4.8% | 4.7% | 9.6%      | 4.8% | 3.4% | 17.2%    | 14.6% | 15.8% |
|   | F | 7.0%    | 4.3% | 2.7% | 13.7%     | 4.8% | 5.7% | 19.3%    | 15.1% | 16.3% |
|   | M | 8.3%    | 5.1% | 6.3% | 8.7%      | 7.3% | 3.6% | 16.2%    | 14.7% | 16.0% |

Source: Authors' calculations from data from Banco Central de Reserva, El Salvador

We also examine returns to levels of education in Table 5.96. Here we see that, compared to those with no education, individuals with some primary education would had a wage nearly 50 percent higher in 2000 while those with university education had a 230 percent higher wage. Overall, we see that there is very little difference between men and women's education returns, though the returns for men seem to be somewhat higher for primary and secondary, while returns for women seem higher from tertiary education. More importantly, we see a pronounced downward trend in education returns by level over the last ten years, especially between 2000 and 2009. These trends seem to indicate that the equilibrium price for educated Salvadorans is decreasing, though whether this is due to increased supply or weakening demand or some combination of the two we cannot tell.

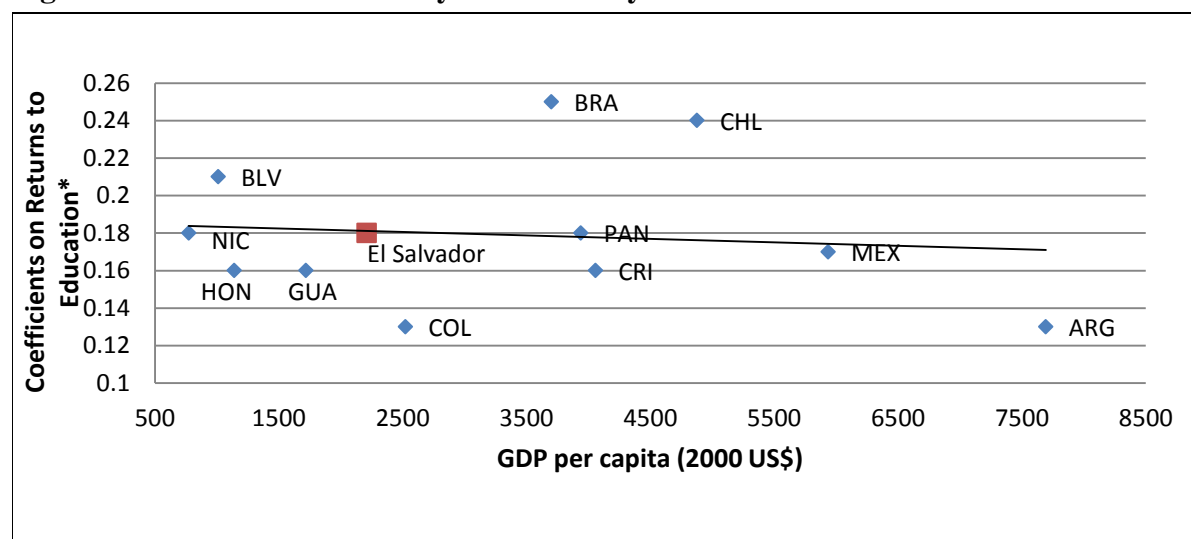
**Table 5.97: Returns to Level of Education**

|        |           | 2000 | 2005 | 2009 |
|--------|-----------|------|------|------|
| Total  | Primary   | 0.48 | 0.29 | 0.26 |
|        | Secondary | 1.21 | 0.72 | 0.66 |
|        | Tert-Tech | 1.67 | 1.23 | 1.27 |
|        | Tert-Univ | 2.29 | 1.36 | 1.38 |
| Male   | Primary   | 0.49 | 0.31 | 0.24 |
|        | Secondary | 1.17 | 0.73 | 0.63 |
|        | Tert-Tech | 1.57 | 1.19 | 1.09 |
|        | Tert-Univ | 2.24 | 1.32 | 1.29 |
| Female | Primary   | 0.37 | 0.22 | 0.26 |
|        | Secondary | 1.18 | 0.70 | 0.69 |
|        | Tert-Tech | 1.78 | 1.30 | 1.47 |
|        | Tert-Univ | 2.25 | 1.39 | 1.48 |

*All Coefficients Significant at the 1% level*

*Source: Authors' calculations from data from Banco Central de Reserva, El Salvador*

In the preceding examination of returns to education we have seen that tertiary returns are higher in El Salvador. Looking across countries for tertiary returns requires a careful construction of the analysis consistent across countries. In Figure 5.97 below, we plot tertiary returns from other countries in the region from the Contreras and Gallegos (2011) comparative paper against GDP per capita. We see that for Latin America, just as Psacharopolis and Patrinos (2002) point out with global comparisons, in general a nation's tertiary returns tends to decrease with per capita GDP. For tertiary returns, El Salvador seems to once again fall directly on the regional trend line, indicating that for its level of development, the tertiary returns in El Salvador seem to be about what would be expected.

**Figure 5.98: Returns to Tertiary Education by Income**

*Source: Contreras and Gallegos (2011) and World Bank national accounts data*

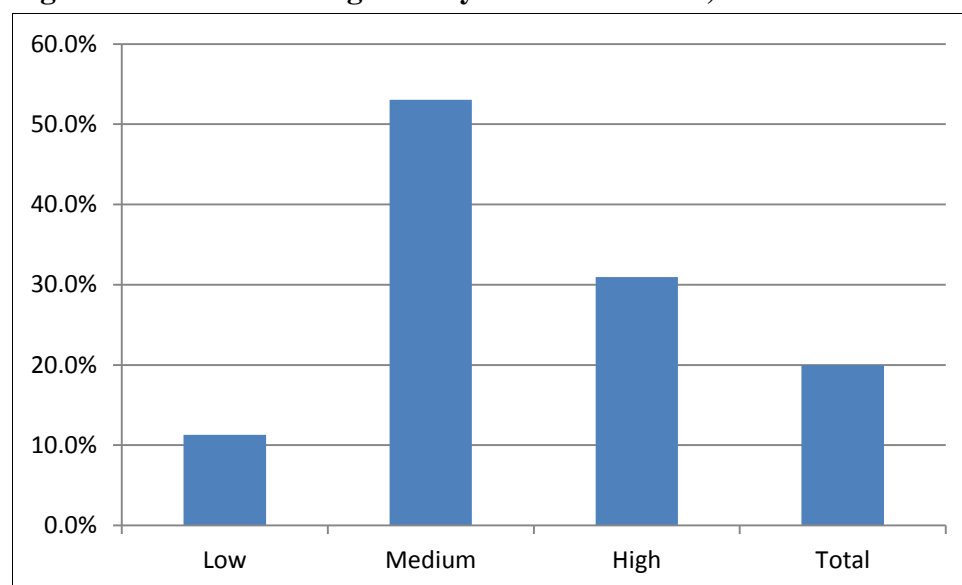
*\*Contreras and Gallegos coefficients significant at 1%*

If scarcity of education were a constraint to overall economic growth, we would see firms competing to employ the more educated, thus driving up returns to education. The fact that we

do not see this in El Salvador, even while education attainment is low, indicates that demand for Salvadoran workers with a higher quantity of Salvadoran education is not high.

Finally, the high rate of migration from El Salvador among the more educated is consistent with the somewhat low returns to education in the country as migration is typically thought to be a function of concerns for personal security and/or economic opportunity. In El Salvador there seems to be evidence for both: Homicide rates are epidemically high, and we see a large wage wedge between El Salvador and the most popular migration destination of the United States. Overall, some 20 percent of the country's residents migrate. As illustrated in Figure 5.98, the rate of migration from among those with a Medium or High level of education is far higher (perhaps 3-5 times higher) than the rate of migration among those with a low level of education. The share of migration is staggering: more than half of those with medium levels of education migrate, as do nearly a third of those with high levels of education.

**Figure 5.99: Share of Migrants by Education Level, 2000**



*Source: (Docquier and Marfouk 2005)*

While this high level of out migration, particularly among the more educated, may certainly have some negative impacts on economic growth on its own, it is ultimately a symptom of other challenges in the economy. This higher propensity to migrate among those with better education levels again indicates that education premiums are not high in El Salvador, especially when compared to other places—principally the United States. As with other types of capital, when unfettered, human capital will flow to its most productive use. The wage gap between the Salvadoran and U.S. labor market is inducing Salvadoran labor to flow out of El Salvador and into the US. In this case it seems that the more educated are finding more productive use, and so find a higher wage, in the US.

This seems to be an example of what Hausmann and Klinger (2007) and Pritchett (2008) call the “fanbelt effect,” wherein one problem leads to another perhaps larger problem. Here, challenges of productivity in El Salvador along with wage differentials for workers in the US and El Salvador and possibly safety and security concerns have induced Salvadoran labor to leave, creating additional challenges for the economy. Cabrera (2011) concludes that even just looking at the accounting costs of education, the country spends more educating migrants (a public expense) than it receives from that migrants’ remittances (a private benefit).

This brain drain may also inhibit human capital accumulation, thus slowing any structural transformation of the economy to one which places a higher premium on knowledge. El Salvador thus may be in something of an education trap where migration creates a “leak” between trying to attract higher value-added industries by improving education levels and attainment, which industries in turn create higher demand for education. Still, addressing problems caused by migration without first (or at least simultaneously) attending the challenges which precipitate migration seems unlikely to be effective. Furthermore, it is noteworthy that those with high levels of education are nearly half as likely to migrate as those with medium education, even as returns to tertiary education is far higher. This may indicate some window of hope for extricating the country from this dilemma: If training is high enough and of good enough quality, the returns to that superior level of human capital may be sufficient to keep a large share of Salvadorans in the country who might otherwise migrate.<sup>49</sup>

### *Education and the HRV Tests*

Applying the four HRV criteria to education or human capital, we first look at the shadow price. As seen above, the shadow price is middling to low, seen explicitly in the Mincer returns to education which are positive but definitely lower than the regional average. Returns to Tertiary education are high (15-16 percent) relative to primary and secondary education (returns of 3-6 percent) indicating that internally tertiary education is relatively more constraining than the lower grades. However, these returns for tertiary are similar or slightly lower than the average tertiary returns for the region, indicating that El Salvador is no more constrained than its neighbors in this regard. This evidence suggests that Human Capital on its own is not a binding constraint in the Salvadoran economy as presently constituted.

Next we would like to explore how movements in education are associated with movements in economic growth. However for an investment with a long gestation period like education, this test is less useful as it becomes increasingly difficult to identify an effect with a very long lag.

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<sup>49</sup> This assertion, of course, has a host of identification problems and would be a profitable area of further inquiry, but in the absence of readily-available data this link seems plausible. Costs and benefits of the provision of higher levels of education should be assessed to indicate profitability of any policy aimed at using public money to provide a good such as advanced training (technical or university) which is generally believed to have largely private returns.

Levels of education and levels of income have seen contemporaneous increase, but we are unable to determine the direction of causality.

Thirdly, according to Hausmann, Rodrik and Velasco, we should see private sector actors trying to get around the constraint. Indeed there is some evidence of this as  $1/6^{\text{th}}$  of schools in the country and serve  $1/5^{\text{th}}$  of the country's students. However we do not have data on levels of private education in neighboring countries, nor do we have household survey data to understand the choice factors involved in sending a child to private versus public school in El Salvador. Similarly, according to the World Bank 2006 Enterprise Surveys, 49.6 percent of Salvadoran manufacturing firms offered formal training to their employees, markedly higher than the regional average (43.3 percent) and the world average (34.9 percent). As manufacturing is export-oriented, this may be an indication that education quality is a constraint for firms in the tradables sector as they are actively trying to get around the low levels of Salvadoran education.

Fourth and finally, industries which thrive should be less intensive in the constraint while industries which are more intensive should be comparatively few. This certainly holds for El Salvador as while many of its top 11 exports in 2009 are labor intensive, none is particularly intensive in human capital.

This lack of demand for human capital particularly among exporters and the lack of human capital-intensive exports may indicate that El Salvador currently cannot compete well in such goods on the world market. The “camels” or survivors in El Salvador's tradables sector are those industries which are not intensive in well-educated labor, suggesting that education may be constraining exports.

### *Education Conclusion*

So long as the current supply-demand equilibrium holds the shadow price will be low and human capital formation cannot be considered a binding constraint. Furthermore, attempts to marginally increase supply without simultaneously increasing domestic demand are unlikely to meet with success as the additional supply will simply be siphoned off by foreign demand. Though further investigation would be required to substantiate the hypothesis, this may constitute a type of low equilibrium human capital trap from which it may be difficult for El Salvador to escape. What data we do have, however, indicates a possible way out through higher-skilled training, though the costs and benefits of such a measure should be considered prior to public expenditure.

Some have suggested that the interaction between innovation and education is an important aspect of the economy and that the lack of either of these could constitute a constraint to private investment in El Salvador<sup>50</sup>. While it is difficult to conceive that the interaction effect of two branches of the HRV Growth Diagnostics Tree may have a larger effect than the direct effect of either branch (or in other words, that the cross-partial derivative in the constrained optimization

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<sup>50</sup> See, for example, Monje-Naranjo and Rodriguez-Claire (2006), who make this theoretical argument.



function theoretically underpinning the HRV approach is higher than the sum of each of the two direct partial derivatives), the innovation and education branches of the HRV tree in El Salvador may be an area where this holds. As potential descriptive evidence, Table 5 illustrates that El Salvador is decidedly in the bottom half of the region on the Knowledge Economy Index, which is constructed as an average of 4 components. On two of these, Economic Incentive Regime and Information and Communication Technology, El Salvador does reasonably well. But on the Innovation and Education scores, the country does poorly.

**Table 5.100: Knowledge Economy Index**

| Rank | Country                | KEI  | Economic Incentive Regime | Innovation | Education | ICT  |
|------|------------------------|------|---------------------------|------------|-----------|------|
| 42   | Chile                  | 7.09 | 8.76                      | 6.85       | 6.48      | 6.27 |
| 46   | Uruguay                | 6.49 | 6.35                      | 5.37       | 7.79      | 6.45 |
| 50   | Costa Rica             | 6.03 | 6.60                      | 6.25       | 5.19      | 6.07 |
| 75   | Colombia               | 4.84 | 4.27                      | 4.48       | 5.09      | 5.50 |
| 77   | Peru                   | 4.79 | 4.49                      | 3.87       | 5.61      | 5.16 |
| 91   | El Salvador            | 4.06 | 5.02                      | 3.29       | 3.37      | 4.56 |
| 94   | Ecuador                | 3.90 | 1.94                      | 4.00       | 4.52      | 5.12 |
| 96   | Dominican Republic     | 3.85 | 4.09                      | 2.91       | 4.39      | 4.03 |
| 101  | Bolivia                | 3.46 | 3.01                      | 2.95       | 4.81      | 3.08 |
| 107  | Honduras               | 3.21 | 3.59                      | 3.16       | 2.97      | 3.13 |
| 110  | Guatemala              | 2.89 | 3.50                      | 2.01       | 2.75      | 3.31 |
| 111  | Nicaragua              | 2.81 | 3.46                      | 2.09       | 3.09      | 2.61 |
|      | Latin American Average | 5.21 | 4.71                      | 5.80       | 5.05      | 5.27 |

Source: World Bank, Knowledge for Development Program (2009)  
[http://info.worldbank.org/etools/kam2/KAM\\_page5.asp](http://info.worldbank.org/etools/kam2/KAM_page5.asp)

Innovation on the KEI somewhat proxies the demand for human capital. The fact Innovation and Education (demand and supply of human capital) are simultaneously low indicates that firms do not make use of higher skilled labor, but also that such labor is scarce.

Still, the current low level of human capital and its potential interaction with innovation would seem to preclude some potential future paths of economic growth. Whether these paths, including following Costa Rica's transformation into a knowledge economy by attracting large, sustained investment from a high-tech firm like Intel, are optimal for El Salvador compared to alternatives is a separate question. Questions of future growth paths such as these are less well suited to the HRV methodology.

From the available evidence we cannot conclude that education or training on its own is a binding constraint to the current Salvadoran economy. However, this is not to say that El Salvador should invest less in education. Improved levels of education are still likely to help the economy even though they are not the most critical constraint for today's economy. Moreover, there are intrinsic reasons to invest in education apart from the instrumental reason of education being an input into economic growth. These include education being important for citizens to lead healthy and happy lives and to participate in and strengthen civil society.

Even still, there are at least two reasons why education may be a strategic investment undertaken now to encourage private sector investment and economic growth: First, human capital may be an emerging impediment on El Salvador's future growth path. That is, human capital may become a binding constraint in the near future as the future economic path of the country takes shape and as other constraints are relaxed. Currently, as one of the factors of production for El Salvador's tradables sector, improving human capital may improve competitiveness: Because El Salvador needs to compete in global market, its factors of production must be competitive, and El Salvador does not compare well in human capital quality. As human capital investments require a long lead time to reach maturity, it may be appropriate to make such investments now in preparation for the future. Second, some evidence indicates that increasing education levels can reduce crime rates

In sum, the shadow price on human capital appears low: Supply quantity is low compared to the region (though appropriate for El Salvador's level of development); the quality of education is also low. At the same time, demand is also low, particularly for primary and secondary education, though less so for tertiary. Consequently human capital cannot be concluded to be a binding constraint in the current economy for existing firms and industries. Other reasons to invest in education as both an intrinsic public policy goal and as an instrumental tool in relaxing other current constraints in El Salvador's economy may exist.

## *Health*

The other important aspect of human capital for growth is health. Health, though of intrinsic value in promoting happy livelihoods, acts instrumentally on economic growth and private sector investment decisions in very particular ways. For health issues to be considered binding on private sector investment and economic growth, they must have an effect on labor productivity. In this context, then, we are looking for evidence of poor health which may act as an obstacle of the use or accumulation of human capital. Usually when health rises to the level of a binding constraint it does so on an epidemic level (similar to the loss of productivity due to AIDS and malaria in Sub-Saharan Africa).

In El Salvador, though we see that there are certainly areas where health in general could be improved, the evidence does not refute our null hypothesis that health is not a binding constraint to growth. We note two important pieces of evidence.

First, El Salvador has made important progress on the eradication, elimination, and control of sickness preventable by vaccination. The country has been free of poliomyelitis since 1987, the last case of measles in the country was confirmed in 1996 (OPS-OMS 2007), and diphtheria and neonatal tetanus have been eliminated.

Second, 74.2 percent of all deaths reported in 2007 were not linked to transmissible disease: external causes of injury (assault) was the leading cause of death (homicide 58 percent, traffic accidents 10.2 percent), followed by cardiovascular diseases, cancer, renal failure (perhaps as cardiovascular complications) and diabetes. In general, during the 1997-2005 period, mortality from chronic diseases has been increasing (El Salvador Ministry of Health).

This evidence indicates that El Salvador does not suffer from plagues or widespread communicable disease which diminishes productivity. Furthermore, other causes beyond sickness of any sort are by far the leading cause of death—violence and traffic accidents being the most important health obstacles to applying one's accumulated human capital to productive use. Accordingly, we cannot conclude that health is a binding constraint to growth in El Salvador.

Still, if there is a health-related theme which is most likely to restrict economic growth in the country, it appears that it may be early childhood development and nutrition.

Early Child Development is important for future economic productivity of children. (See World Development Report 2006 for a brief fairly thorough treatment and Carneiro and Heckman (2004) among others for a discussion of rates of return for human capital investments in early childhood development versus at other points of intervention).

Diarrhea continues to be one of the leading causes of morbidity, greatly contributing to nutritional deterioration of children under 5 years and a depressed of growth rate, which if not corrected, can lead to malnutrition (FESAL 2008). According to FESAL 2008, the prevalence of diarrhea has been stable since 2003 with 13.8 percent of all children under 5 years of age had diarrhea in the two weeks prior to the interview. The prevalence of diarrhea is higher in rural areas where it reached 15.9 percent compared to 11.5 percent in urban areas, and is more common among children over one year (21.7 percent).

The high prevalence of stunting (height for age) is 19.2 percent in children under 5 years, indicating that the main problem is likely not acute food shortages, as far as food safety concerns, but rather reflects a process of long-term chronic diet deficit (likely from pregnancy) as a result of the living conditions of the population, especially for those in rural areas.

In 2008 only 31 percent of children younger than 6 months are exclusively breastfed. Complementary foods are introduced to age considerably lower than those recommended by WHO and this is an important cause malnutrition in the first year of life.

The Ministry of Health of El Salvador identifies anemia as an area of particular concern for the country. Anemia is mainly caused by iron deficiency and is the result of low quality and diversity in the diet. Anemia increases the risk of maternal mortality, delayed psychomotor development of children, reduced learning ability and school performance, and reduces endurance and labor productivity adult. Anemia affects both rural and urban areas and there are no major differences across socioeconomic status (Ministry of Health, 2008).

Preschoolers, particularly those under two years, represent a population highly vulnerable to developing iron deficiency anemia. According to the latest family health survey (FESAL 2008), iron deficiency has increased dramatically, with a 23-percent rise nationally in the last 10 years. Differences are maintained by area of residence, with 20.4 percent in children aged 1-5 years in urban areas and 25 percent in rural areas. The prevalence of anemia in pregnant women is especially high during the third trimester of pregnancy, which increases the risk of death from hemorrhaging during childbirth.

We cannot apply the HRV tests to childhood nutrition because there is little data available to explore the shadow price of cognition on economic growth in the Salvadoran context<sup>51</sup>, but these descriptive statistics are suggestive that childhood nutrition may be important to the long-term future growth of the country even while overall health is currently not constraining.

### c. Geography

Geography, or “natural capital,” is also sometimes attached to the Low Social Returns branch, though the HRV paper spends little time developing it. The key conceptual problem in framing geography within the HRV methodology seems to be the quite narrow and at times null set of public policies (beyond infrastructure efforts already mentioned) which can alter those geographic features (or their effects) which may inhibit private sector investment. We give an accordingly brief treatment of geography here.

Based on the evidence compiled, geography is not a binding constraint in El Salvador. While El Salvador has geographical constraints, including limited land mass, low levels of arable land, environmental problems, and susceptibility to natural disasters, these constraints, when tested against the four tests outlined in the “Mindbook,” are not among the binding constraints to economic growth in El Salvador.

El Salvador is the smallest country in Central America, with a total area of 20,742km<sup>2</sup>, and an estimated population density of roughly 289 inhabitants/km<sup>2</sup> (CIA World Fact Book, 2011). Not only is El Salvador small in geographic area, but only 32.9 percent of its land is arable (World Bank Development Indicators, 2007), and what little land is arable has been plagued by mismanagement.

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<sup>51</sup> Notwithstanding the lack of evidence for El Salvador in particular, evidence from (Carneiro and Heckman 2004) for the United States suggests that over the very long term, early childhood development has superior benefit-cost ratios to any other known education investment.

El Salvador has 321 km of coast along the Pacific and is centrally located between North and South America. El Salvador's geography offers potential for maritime transportation, which in general is cheaper than overland transportation and, therefore, increases access to markets. Access to a coast in general is an indicator of greater economic development.

El Salvador's year-round growing season allows farmers to grow products for export during cold seasons in the temperate climates of North America and South America. The United States Agency for International Development (USAID), the Department of Agriculture of the United States (USDA) and the Ministry of Agriculture (MAG) have had some success in capitalizing on the ability of El Salvador to grow its products for export to the United States during the winter months.

El Salvador has an abundant supply of water, although a large part of the water's surface has been contaminated by human and industrial waste. Thirty eight percent of the generation of electricity in El Salvador comes from hydroelectricity due to the abundant rain during the six month rainy season (SIGET 2007). Likewise, El Salvador is the leader in the Central American region in the production of geothermal energy as a percentage of the total generation of electricity. Geothermal energy production represents 14 percent of El Salvador's total energy production (SIGET 2010).

### *Property Rights and Land Use Issues*

In 1980, El Salvador instituted agrarian reform, expropriating the landholdings of all persons owning more than 500 hectares. Under this reform, nearly 15 percent of all Salvadoran farmland was appropriated and distributed in small plots to subsistence farmers, or used to form farming cooperatives. Much of the best land was formed into cooperatives, which subsequently failed to thrive. The limit on landholdings was increased from 100 hectares in 1930 to 245 hectares in 1983. However, to date, the majority of landholdings remain in small plots – with 85 percent of the landholdings in plots of less than 1.71 hectares.

**Figure 5.101: Size and quantity of land holdings, 2007**

| Size of Plot<br>(Hectares) | Number of Land<br>Owners | Percentage    |
|----------------------------|--------------------------|---------------|
| Hasta 0.49                 | 141,823                  | 36.3 percent  |
| 0.5 - 0.99                 | 126,232                  | 32.3 percent  |
| 1 - 1.71                   | 66,964                   | 17.1 percent  |
| 2 - 2.99                   | 19,663                   | 5.0 percent   |
| 3 - 3.99                   | 6,759                    | 1.7 percent   |
| 4 - 4.99                   | 5,499                    | 1.4 percent   |
| 5 - 9.99                   | 10,110                   | 2.6 percent   |
| 10.06 - 19.99              | 6,295                    | 1.6 percent   |
| 20 -49.99                  | 4,954                    | 1.3 percent   |
| 50 - 99.99                 | 1,435                    | 0.4 percent   |
| 99.94 o mas                | 741                      | 0.2 percent   |
| Total:                     | 390,475                  | 100.0 percent |

Source: Ministry of the Economy, DIGESTYC, VI Agricultural Census, 2007-2008

This concentration of landholdings in small plots, despite the legality of owning large plots up to 245 hectares, would seem to indicate that land owners are not constrained by the limit of 245 hectares per land owner. If it were a constraint, one would expect to see many land owners at the 245 hectare limit and trying to acquire more land. In fact, the trend is quite the opposite, with most land concentrated in small, subsistence plots.

### *Management of Natural Resources*

El Salvador suffers from deforestation, poor management of land and water, overfishing and other environmental problems. For example, El Salvador is the second most deforested country in the Western Hemisphere, only after Haiti, and 95 percent of the Salvadoran territory has been degraded by bad agricultural practices and misuse (UN Food and Agricultural Organization,

(FAO) 2010). The problems of mismanagement of natural resources are problems of property rights and externalities and therefore must be considered under the branch of “Low Appropriability” in the HRV diagnostic tree.

In some cases, resources have been over-exploited, such as in the case of soil degradation from overuse and deforestation. El Salvador has suffered massive deforestation, resulting in forest cover of only 5.8 percent of El Salvador’s total area (FAO, 2002). Anecdotal evidence indicates that artisans specializing in wood handicrafts and furniture now have to import wood for the production of handicrafts. However, from an economic viewpoint, they are now paying market price for an input that they would otherwise have likely obtained for free from forests.

To be able to conclude that mismanagement of natural resources is a binding constraint, mismanagement must have a shadow price so high that the relief of the constraint would result in general increases of GDP, which would be higher than the increases in the GDP from relief of other constraints.

Economists have attempted to place a shadow price on environmental degradation. In 1996, the Business Council for Sustainable Development with the partner organization, FUSADES, published a study called “The Salvadoran Challenge: From Peace to Sustainable Development” known as the Green Book, in which they placed the economic value of environmental degradation at 3-4 percent of GDP per annum. They calculated this shadow price using the total cost of the effects of diseases such as diarrhea and respiratory infections; productivity losses in land used for basic grains; dam sedimentation and associated increased costs of electricity generation; and depreciation of dam equipment due to sediments and other chemicals. Another study estimated the health impact of environmental degradation to be 2.5 percent of GDP (Panayotou 1998) (Strukova 2005), of which inadequate water and sanitation services, poor hygiene, and air pollution constituted the highest costs.

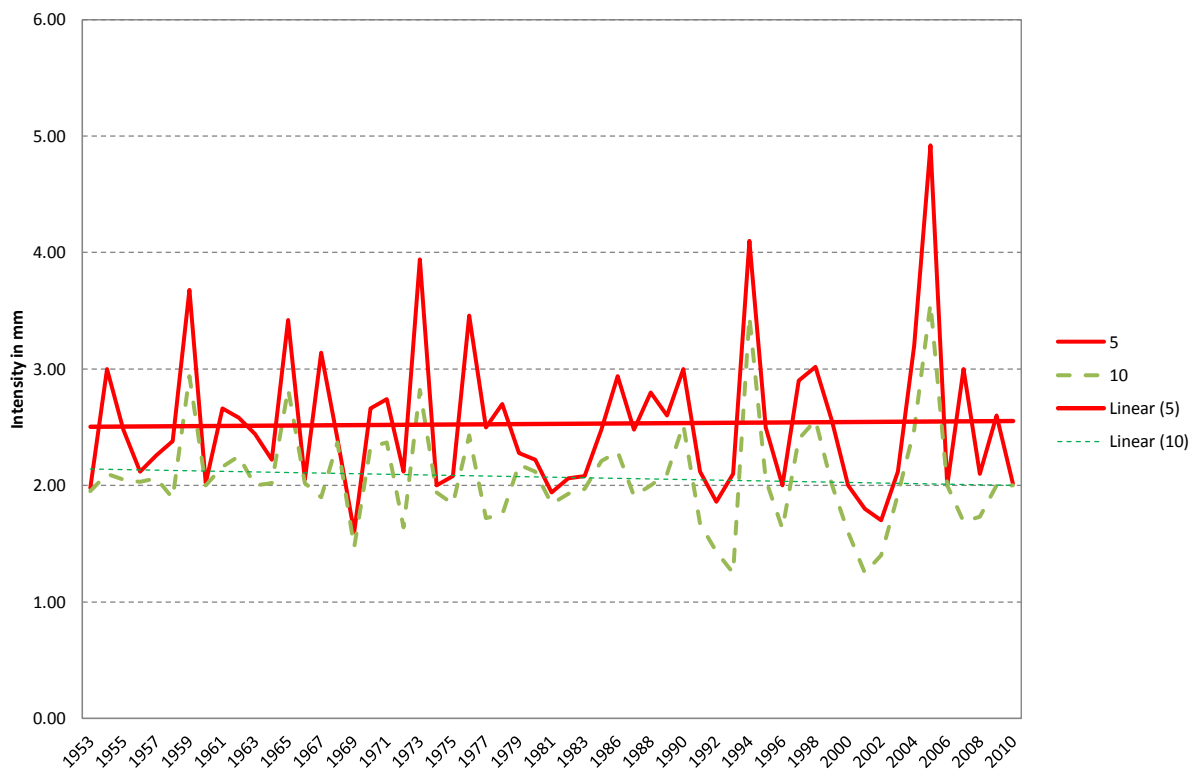
According to a report to the Inter-American Development Bank 2005, “economic growth in El Salvador is being affected by the unsustainable use of the factors and their level of environmental performance. A 1996 study showed then that although the economy had experienced an average annual growth of 5 percent during the first half of the nineties, the country was losing between 3 percent and 4 percent of GDP as a result of the severe degradation environment, based on conservative estimates of the loss of value and productivity of some resources ... Moreover, if economic sectors (industry, tourism, agriculture) in the country depend critically on natural resources, degradation of these resources necessarily have a severe impact on growth of the same ” (Pratt 2005, 5).

However, these are social costs and not necessarily binding on private investment. There are other constraints that more directly affect private investment in the near term, and later sections will cover recent evidence of links between natural disasters and economic growth.

## Climate Change

El Salvador has a tropical climate, characterized by a dry season (from November to April) and a rainy season (from May to October). Historically, there has been flooding during the rainy season.

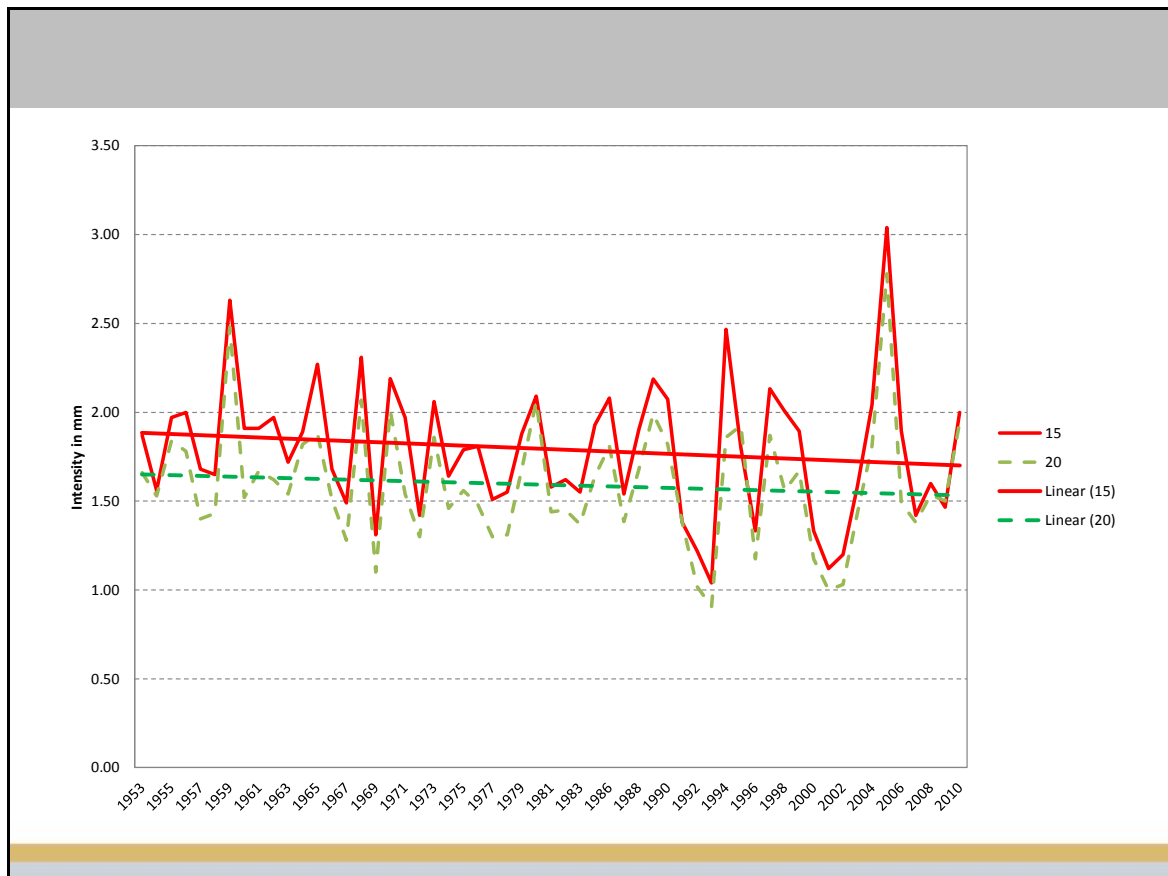
**Figure 5.102: Trend of Intensities of 5, 10 minutes, Ilopango**



Source: Environmental Monitoring of the Ministry of Environment (SNET)

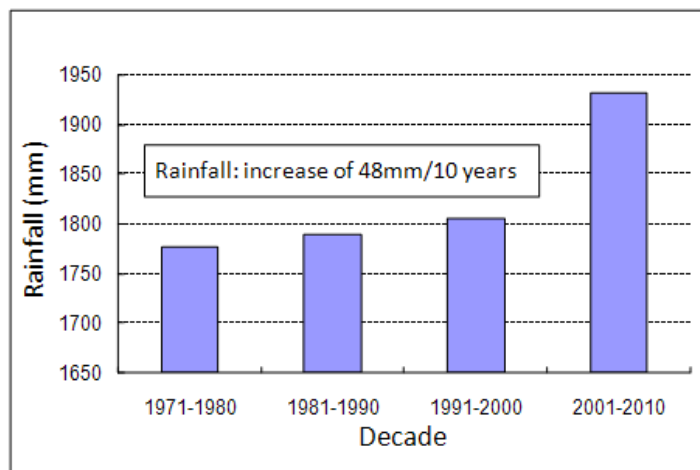


**Figure 5.103: Trend of Intensities of 15, 20 minutes, Ilopango**



Source: Environmental Monitoring of the Ministry of Environment (SNET)

**Figure 5.104: Decadal rainfall: Annual average precipitation for 25 main weather stations, 1971-2010**



Source: Environmental Monitoring of the Ministry of Environment (SNET)

Based on the average rainfall of 25 weather stations in 1971-2010, it appears that precipitation has increased by 48mm each decade. This increase, according to the linear trend, is marked in the last decade 2001-2010 to 1932 mm of rain, where the years 2005 and 2010 (January to

September) have been the wettest period of 40 years. Such increase in rainfall is linked to natural disasters. An example of this was the low pressure associated with Hurricane Ida E96 in November 2009 which produced localized intensities up to 81 mm per hour and 355 mm in 24 hours, resulting in landslides and floods.

### *Principal Threats: Cost and Persistence of Disasters*

Close to 88.7 percent of the territory of El Salvador is susceptible to natural disasters and approximately 95.4 percent of the population of El Salvador is at risk for natural disasters. Urban and rural land use has increased exposure and vulnerability to natural disasters. In urban centers, slums are located in areas of risk (in ravines, landfills, railroads, etc.) and a sharp increase in construction of residential and commercial complexes in mountainous areas has increased surface run-off and generated flooding downstream. In rural areas, agricultural practices have tended to be inappropriate and have constituted a source of risk.

Historically, earthquakes and floods have caused the most damage and loss of life. El Salvador is located near fault lines that are sources of strong seismic activity. In particular, this is true for the metropolitan area of San Salvador, where both human population and economic activity concentrate. In addition, El Salvador is located between two great oceans in an area of intense hurricane activity, so it is also strongly affected by La Nina, exacerbating the intensity of rains and droughts.

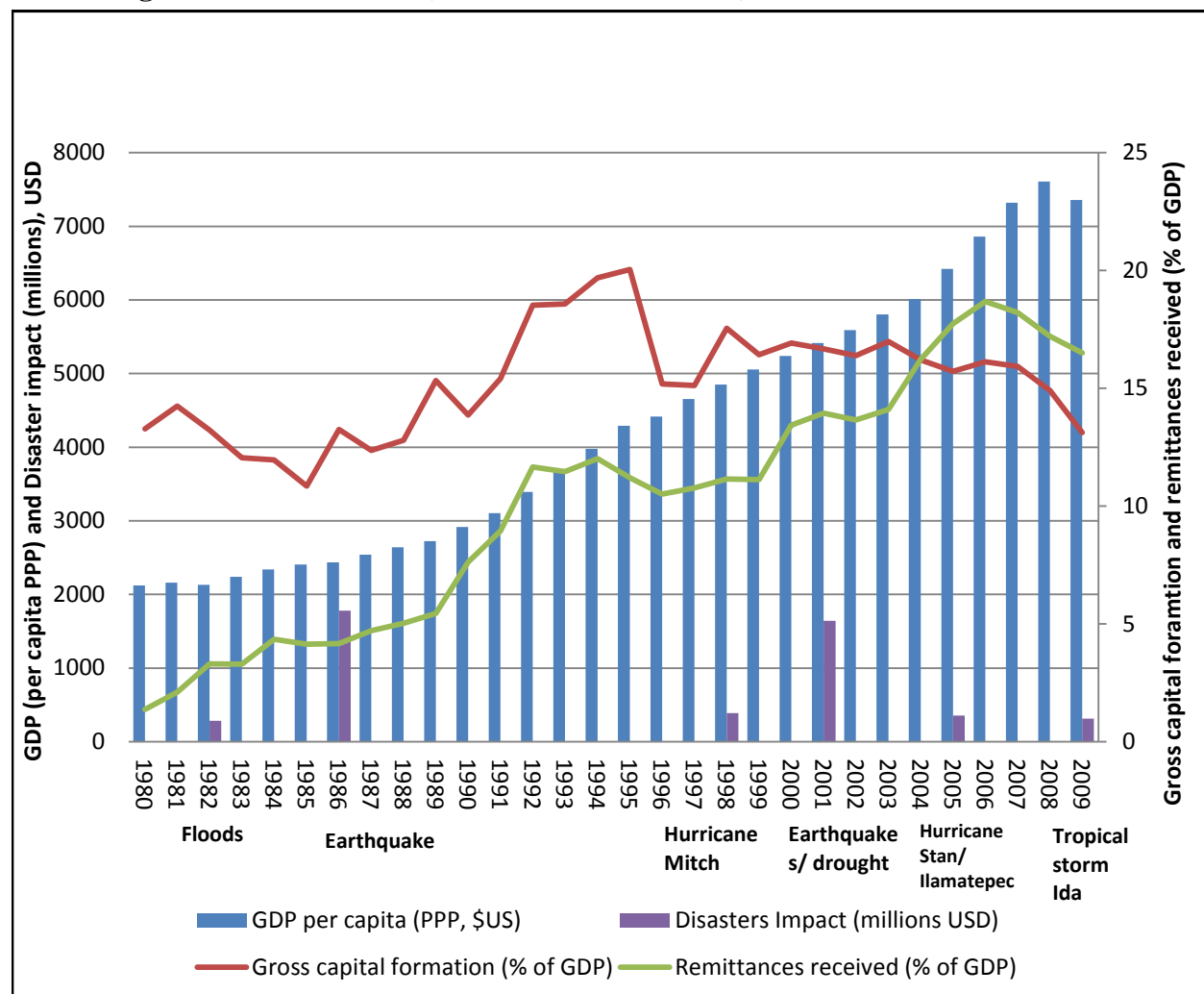
From the total natural disasters experienced by the country during recent years, weather events have generated the largest number of deaths, more than 62 percent and almost the total between 87 percent and 95 percent of total impacts. From 1982 to 2009 the economic impact of losses and damages in El Salvador exceeded USD6,711 million, equivalent to USD248.5 million annually. The population affected surpasses 538 thousand persons per year (almost 9 percent of the total population) (Urzúa Venegas and Zapata Martí 2010). The Economic Commission for Latin America (ECLAC) estimates that in 1982-2005, the impact of natural disasters in El Salvador has been equivalent of 4.2 percent of the previous year's GDP. Again, this is the economic cost of these disasters to society, which may be a loss to consumption as well as investment—it is not clear which.

**Table 5.105: Comparison of the impact of Recent Disasters in El Salvador (in current million dollars)**

| <i>Value of Damages and Losses to Public and Private Property</i> |                 |                                |  |                    |                       |         |
|---|-----------------|--------------------------------|--|--------------------|-----------------------|---------|
|   | Hurricane Mitch | Two Earthquakes in El Salvador | Tropical Storm Stan & Eruption of Ilamatepec Volcano | Tropical Storm Ida | Tropical Storm Agatha | Total:  |
| Total   | 290.1           | 1,302.60                       | 318.5  | 309.8              | 112.1                 | 2,333.1 |
| Agriculture   | 118.3           | 75.6                           | 43.6   | 41.8               | 11.4                  | 290.7   |
| Education   | 9.3             | 171                            | 15.2*  | 10.9               | 12.1                  | 203.3   |
| Electricity   | 0.3             | 13.3                           | -1.2   | -5                 | 0.5                   | 7.9     |
| Environment   | 5.2             | 83.2                           | 19.5   | 59.1               | 12.1                  | 179.1   |
| Health  | 8.7             | 58.8                           | 17.3   | 10                 | 11.5                  | 106.3   |
| Housing   | 10.2            | 271.1                          | 101.3  | 18.1               | 20.3                  | 421     |
| Industry, Business & Tourism                                      | 82.9            | 200                            | 10.3   | 29.9               | 9.2                   | 332.3   |
| Transportation & Communications                                   | 52.6            | 351.5                          | 92.3   | 116.3              | 32.8                  | 645.5   |
| Water & Sanitation  | 1.8             | 18.8                           | 10.6   | 19.3               | 2.2                   | 52.7    |
| Other:  | 0               | 73                             | 9.5  | 9.4                | 0                     | 91.9    |

Source: CEPAL.

**Figure 5.106: Economic Impact of Natural Disasters, Gross Internal Product, Remittances, and Foreign Direct Investment (Millions of U.S. Dollars)**



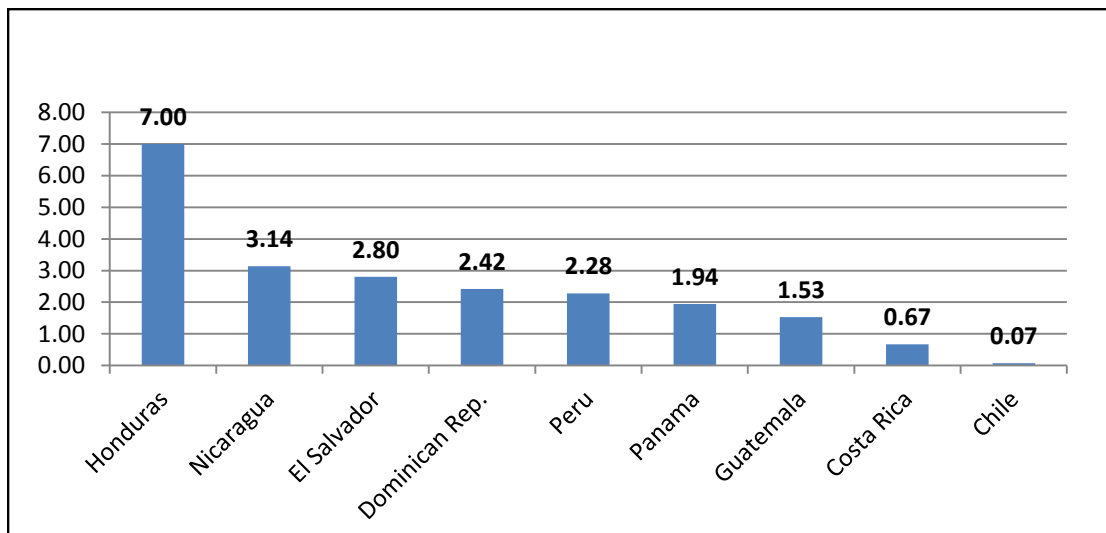
### *Risk of Disaster Indicators*

Inter-American Development Bank (IDB) (2010) created four indicators that measure the risks of disasters in each country:

- a) The Index of Deficit from Disasters (IDD) shows the economic loss that a country could suffer due to a disaster and its implications in terms of resources that are required to mitigate the disaster. A DDI above 1.0 indicates economic losses that exceed the financial capacity of the state even when it increases its debt to the maximum. For 2008, the DDI of El Salvador was 2.8 for a natural disaster that could occur once every 100 years, indicating that the economic losses in case of a disaster would exceed the financial capacity of the state. That index is greater than one for all Central American countries, except Cost Rica, where the index is 0.67.

- b) In the case of Costa Rica, it is classified as the second most country in the world when it comes to vulnerability of territory, with 36.8 percent of its territory exposed to three or more adverse natural events (United Nations-Economic Commission for Latin America and the Caribbean (ECLAC) 1999). However, Costa Rica has successfully mitigated the risks of natural disasters. Since 1969, the Government has had a National Emergency Commission (CNE), with a National Emergency Fund to handle natural disasters. This is significant in that the funds for disaster mitigation are in place when a disaster hits and do not come directly from the budget. The Government of Costa Rica also banned unsafe adobe construction, which is still common practice in the rest of Central America, after an earthquake in 1910. The Government of Costa Rica also requires disaster planning and preparation at all public institutions at all levels. All of these measures have made possible a considerable improvement of Costa Rica's capacity and effectiveness in response to disasters (United Nations-Economic Commission for Latin America and the Caribbean (ECLAC) 1999).

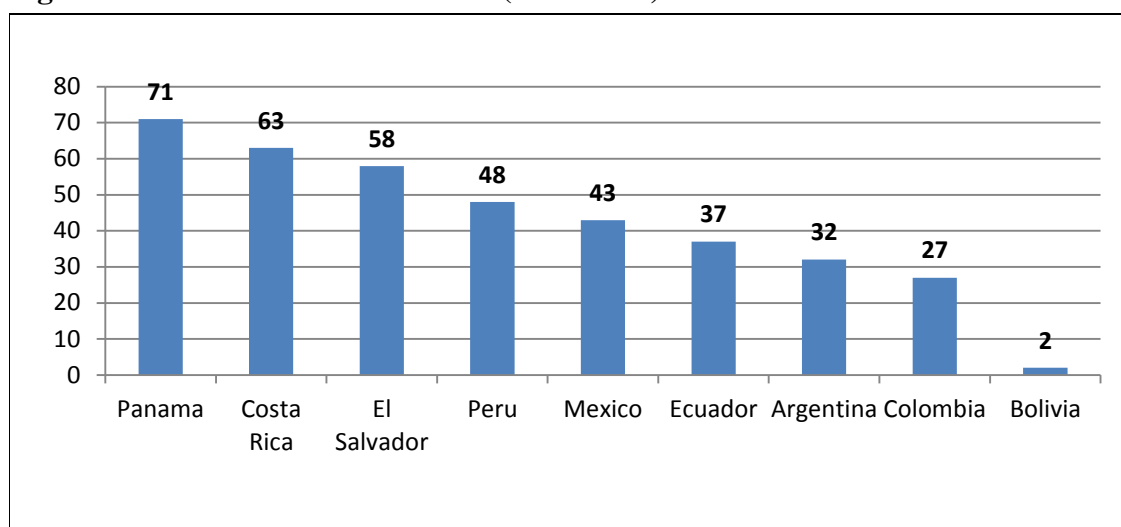
**Figure 5.107: Index of Deficit from Disasters (2008)**



Source: IDB, September 2010

- c) The Local Disasters Index (IDL) assesses the social and environmental risks derived from recurrent, small-scale natural disasters, starting with number of human lives lost, the number of persons affected, and the damages produced. It measures the propensity of countries to suffer this type of disaster and the cumulative impact of disasters on their development. An index below 20 indicates a high concentration of small disasters in a few local areas. An index of between 20 and 50 indicates a normal tendency and one above 50 indicates that a large portion of the territory of a country suffers from recurrent, small-disasters. In El Salvador, the index was 58 for the period 2001-2005, indicating that the vulnerability and the threats are generalized throughout the territory. All of the Central American countries, except Panama and Costa Rica, have indices of over 50.

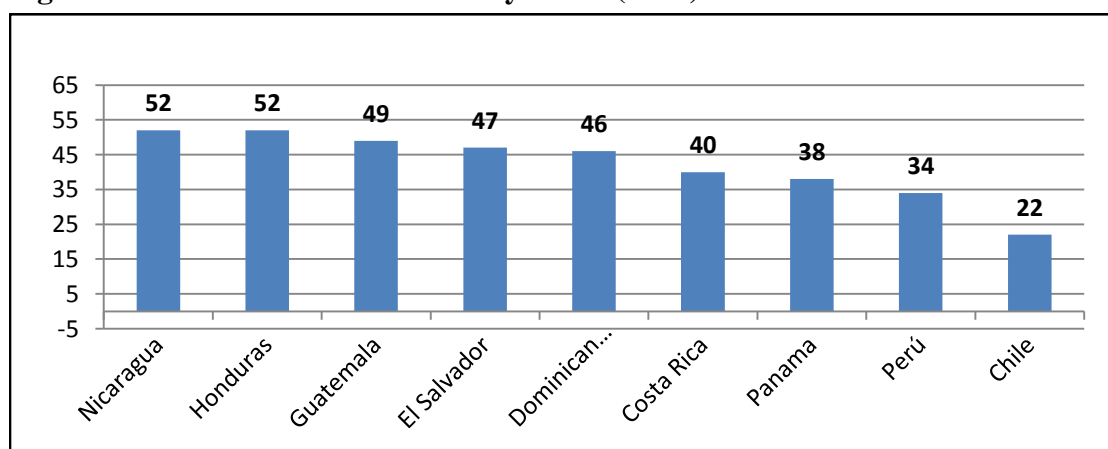
**Figure 5.108: Local Disasters Index (2001-2005)**



Source: IDB, September 2010

- d) The Prevalent Vulnerability Index (PVI) measures the fragility and the exposure of human and economic activity in the zones exposed to disasters and the social and human capacity to absorb the impacts of disasters. The three indicators compounded which form this index consider factors such as demographic growth, population density, poverty and unemployment, degradation of the soil, gender balance, social expenditure and insurance of infrastructure and housing. An index of 20 or less indicates a low level of vulnerability, an index between 20 and 40 indicates a medium level of vulnerability, and an index between 40 and 80 shows a high vulnerability. In El Salvador, that index was 47 for 2007, showing high vulnerability. For all Central American countries, that index is above 40, with the exception of Costa Rica and Panama. The latter countries, despite their fragility, better absorb (with less negative consequences) the impacts of natural disasters.

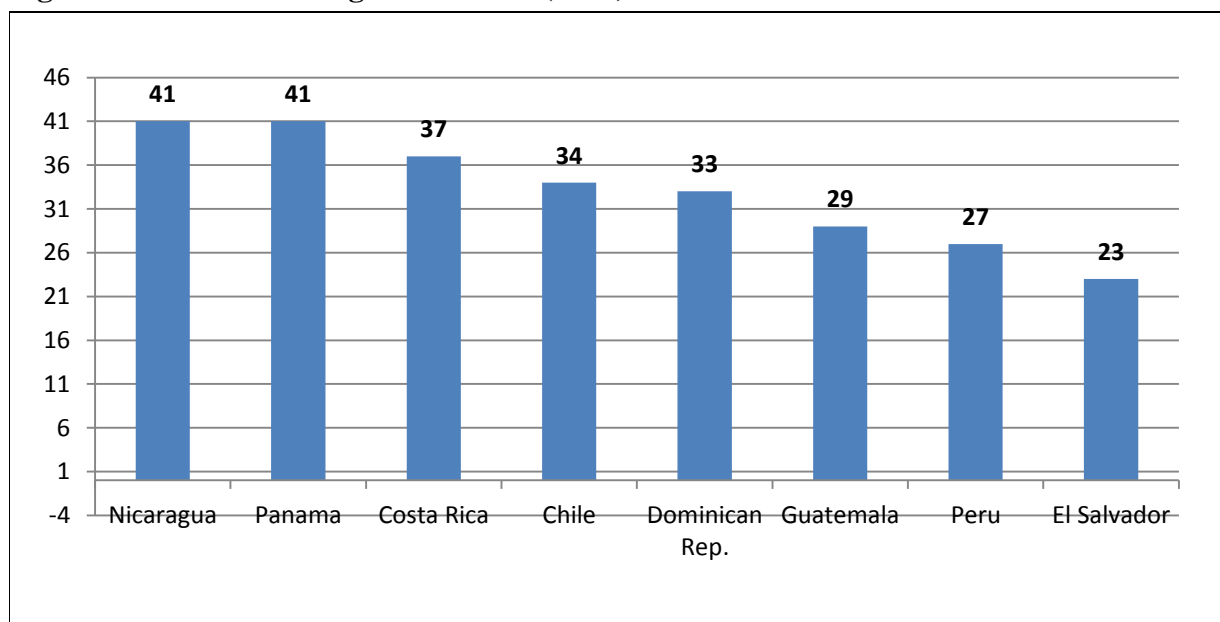
**Figure 5.109: Prevalent Vulnerability Index (2007)**



Source: IDB, September 2010

- e) The Risk Management Index (RMI) measures the performance of risk management of a country, assessing the capacity to identify and reduce risks and to respond and recover from catastrophes. An index below 50 is considered unsatisfactory; between 50 and 75 satisfactory and above 75 exceptional. In 2008, El Salvador had an index of 23, or unsatisfactory. In this case, the majority of countries analyzed, including El Salvador's Central American neighbors, practice better risk management than El Salvador.

**Figure 5.110: Risk Management Index (2008)**



Source: IDB, September 2010

We now subject natural disasters to the four HRV tests, with the premise that natural disasters could both destroy fixed asset investments, as well as discourage future investments.

### **1. Shadow Price of Insurance Against Natural Disasters**

Natural disasters are a risk and the market response to risk is insurance. The actors in general insure themselves whether explicitly or implicitly through self-insurance, private insurance or public insurance.

Assuming that there is a competitive market for insurance, the cost of that insurance can serve us as an indicator or shadow price for the value the market places on the impact of natural disasters. If natural disasters were a constraint to growth in El Salvador, one would expect the cost of insurance to be high. In the following chart we can see the cost of insurance against natural disasters or catastrophic events from Chartis, one of the largest providers in El Salvador. Another source is Citibank, which charges an annual estimate of between 0.3 percent and 0.8 percent for the total amount insured. Insurance costs in El Salvador are relatively low compared to other countries. In the United States, insurance costs are considerably higher, varying

between 1 percent and 5 percent of the total amount insured. El Salvador's insurance costs are not higher than the rest of the region's.

**Table 5.111: Cost of Coverage for Natural Disasters or Catastrophic Events**

| Type of Activity               | Range of Risk Rate<br>(percent on amount insured) |
|--------------------------------|---|
| Offices and financial services | From 0.10 to 0.125 percent                        |
| Businesses                     | From 1.37 to 1.75 percent                         |
| Industries                     | From 1.50 to 1.87 percent                         |
| Residential Buildings          | From 0.10 to 0.125 percent                        |
| Agribusiness                   | From 1.62 to 2.00 percent                         |
| Rural house and beach          | From 3.15 to 3.25 per thousand                    |
| House in Urban Zone            | 3.00 per thousand                                 |
| Vehicles                       | From 4.00 to 6.00                                 |

Source: Chartis Insurance, El Salvador

**Table 5.112: Cost of Coverage for Natural Disasters or Catastrophic Events (percent over amount insured)**

| Type of Activity             | El Salvador | Guatemala | Honduras | Nicaragua | Costa Rica <sup>1</sup> |
|------------------------------|-------------|-----------|----------|-----------|-------------------------|
| Offices & financial services | 0.11        | 0.10      | 0.11     | n.a.      | 0.22                    |
| Businesses                   | 0.16        | 0.13      | 0.14     | 1.04      | 0.22                    |
| Industries                   | 0.17        | 0.15      | 0.16     | 0.17      | 0.22                    |
| Residential Buildings        | 0.11        | 0.09      | 0.10     | 0.18      | 0.22                    |
| Agribusiness                 | 0.18        | 0.21      | 0.18     | n.a.      | 0.22                    |

<sup>1</sup> Data for Costa Rica are an average between 0.2104 percent and 0.2343 percent.

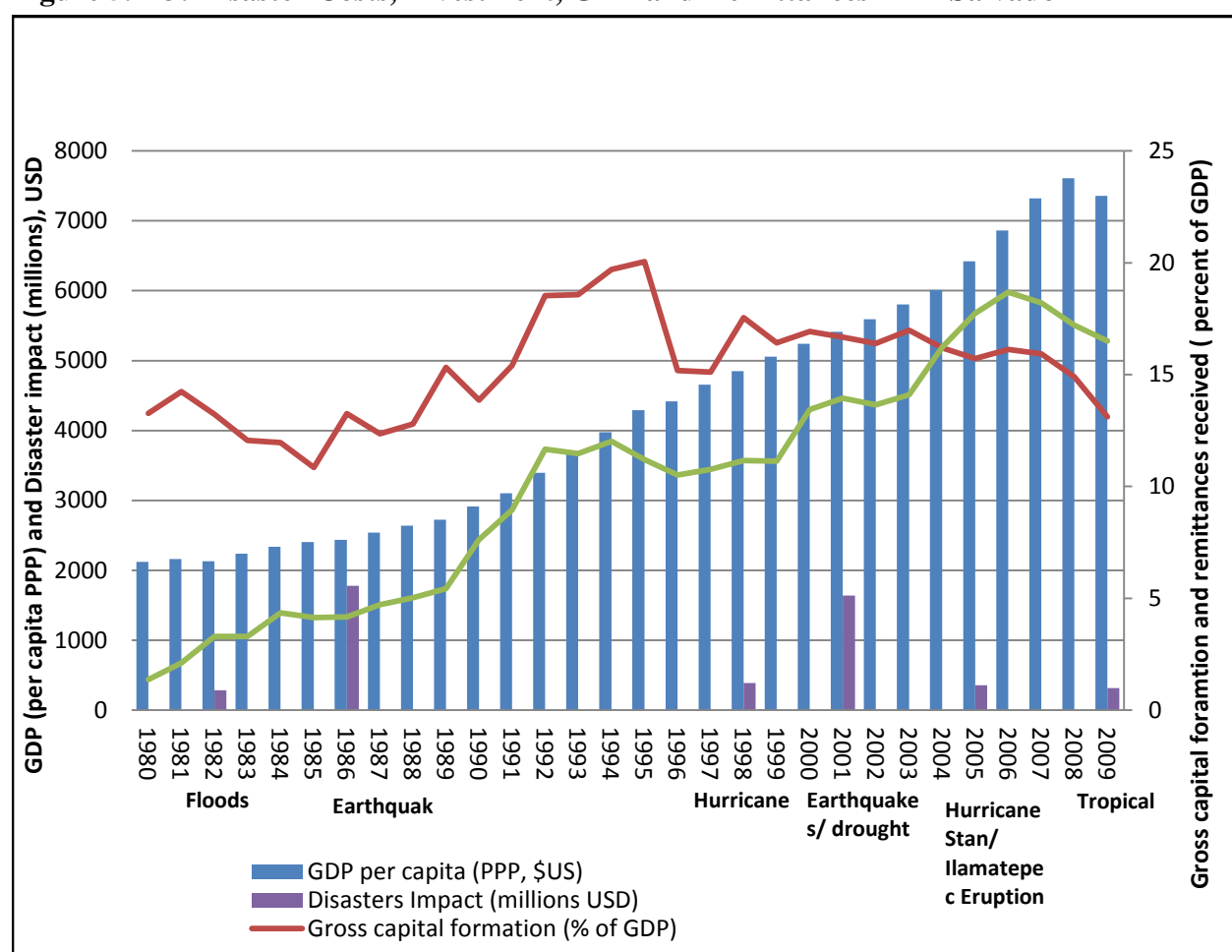
Source: Chartis Insurance, El Salvador

## 2. Movements in natural disasters should produce movements in growth

As Figure 5.112 below shows, natural disasters in El Salvador have not produced perceptible changes in investment or GDP growth trends, nor is there is a clear relationship with remittances received. For example, investment as a percentage of GDP moved less than 1 percentage point the years following the costly earthquakes of 1986 and 2001 (as well as drought in 2001).



**Figure 5.113: Disaster Costs, Investment, GDP and Remittances in El Salvador**



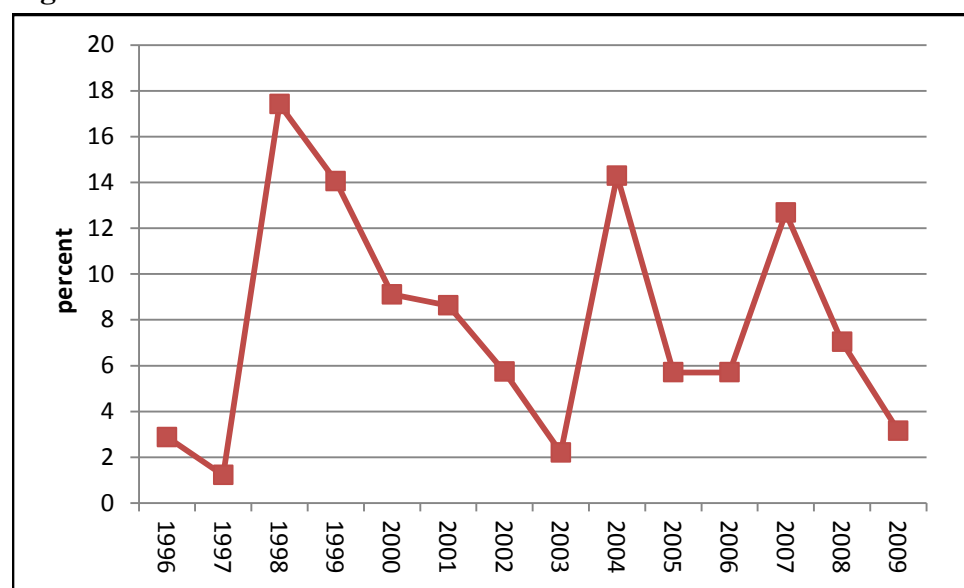
Source: WDI and ECLAC, 2010

### 3. Economic agents are bypassing the constraint

The “Mindbook” (Hausmann, Klinger, and Wagner) prescribes another test of whether a constraint is binding on the economy – where a constraint is binding, one should see agents in the economy attempting to overcome or bypass the constraint. In the case of natural disasters, this can be measured by the market for insurance. In El Salvador, anecdotally, we hear that few companies purchase insurance against natural disasters. This would seem to indicate that natural disasters are not binding on private investment.

Based on ECLAC’s analysis shown in Table 5.104, the transport and communications industry is most negatively impacted by natural disasters. Investment data for the transport industry is not available, but using investment in telecommunications as a proxy for industries most vulnerable to natural disasters, we see that in 1999, 2002, 2006, the years immediately following a major natural disaster, telecoms investment fell or remained stable. This shows that natural disasters could be a binding constraint for a specific industry such as telecommunications, but the link to overall economic growth is less clear.

**Figure 5.114: Private Telecoms Investment as a Percent of Total Investment**



Source: WDI, 2011

### Conclusions

Our analysis of the four HRV tests indicates that risk of natural disasters is not a binding constraint to growth in El Salvador. Although El Salvador has some geographic limitations, including small geographic territory, low levels of arable land, environmental problems, and susceptibility to natural disasters, there are other limitations which are more important. The cost of insurance against natural disasters is relatively low and it serves as an indicator or shadow price for the mitigation of disasters.

In El Salvador, the government usually assumes the cost of damages to infrastructure and damage to poor, uninsured Salvadorans. The state, when it does not have a fund budgeted or a specific allotment to confront disasters, tends to obtain financing either from redirecting the public budget, acquiring international loans, or from foreign donated aid. An example is the earthquakes of January and February 2001, which apart from the loss of life, incurred economic losses of USD1.6 million. This amount is equivalent to 13.5 percent of GDP. According to reports from insurance companies, it is estimated that compensation payments exceeded USD320 million, i.e. 19.9 percent of total estimated losses. The rest had to be financed from other sources, either from savings, borrowing or simply disappeared. Among the alternative measures the government was forced to redirect and suspend a number of programs and projects, and appealed to the international financial institutions to get a higher level of debt in the absence of country-specific financing alternatives.

In sum, natural disaster losses, though significant, are absorbed by the private sector, by the government through fiscal adjustments and international borrowing, or by donors. They have not yet impacted overall economic growth.

## 6. Conclusions

Over the last few months, representatives from the governments of El Salvador and the United States have come together to form a joint technical team to conduct a rigorous, data-driven analysis on the Salvadoran economy and what may be constraining it through private sector investment. The Team has arrived at consensus that El Salvador's growth seems to face at least two binding constraints: crime and security, and low productivity of the tradables sector. No other issues were determined to be binding constraints, in some cases due to insufficient evidence to reach a conclusion, and in other cases because the issues were determined not to be binding constraints.

The purpose of this exercise was not to determine policies and programming to address these constraints. Such decisions will be made through intra- and inter-agency discussions in the coming weeks. We believe that this Constraints Analysis will be a critical tool in accurately targeting areas where joint action between two countries will be most effective in increasing economic growth and reducing poverty in El Salvador.

## 7. Technical Annex

### A. Cointegration Tests

Methodological adaptation was verified based on the work of Mohan (2006) that was to use data from the national savings and constant 1990 prices GDP at constant prices of the same year, in order to formulate a VEC to conduct the causality test Granger on the hypothesis in question, however, after checking that the series were of the same order of integration<sup>52</sup>, have found an appropriate VAR specification that met its assumptions, the results of the trace test and maximum eigenvalue assuming deterministic trend in the data (the best approximation found) indicate that the variables may not cointegrate, so that the VEC was not made. In order to apply the spirit of argument Sims et al. (1980), in favor of non-differentiation of the variables in the calculation of a VAR, even if they are I(1), because this wastes information concerning the comovements in the data, we performed the Granger causality test using both the level and differences.

Date: 04/25/11    Time: 14:53

Sample (adjusted): 1983 2009

Included observations: 27 after adjustments

Trend assumption: Linear deterministic trend

Series: LPIB LSN

Exogenous series: D1992

Warning: Critical values assume no exogenous series

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized<br>No. of CE(s) | Eigenvalue | Trace<br>Statistic | 0.05<br>Critical | Prob.** |  |
|------------------------------|------------|--------------------|------------------|---------|--|
| None                         | 0.248054   | 8.258599           | 15.495           | 0.4382  |  |
| At most 1                    | 0.020569   | 0.561157           | 3.8415           | 0.4538  |  |

Trace test indicates no cointegration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| Hypothesized<br>No. of CE(s) | Eigenvalue | Max-Eigen<br>Statistic | 0.05<br>Critical | Prob.** |  |
|------------------------------|------------|------------------------|------------------|---------|--|
| None                         | 0.248054   | 7.697442               | 14.265           | 0.4103  |  |
| At most 1                    | 0.020569   | 0.561157               | 3.8415           | 0.4538  |  |

Max-eigenvalue test indicates no cointegration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

<sup>52</sup> The unit root tests were performed with the Dickey-Fuller with trend and intercept for LSN and intercept for LGDP, use the automatic selection of lags under the Schwarz information criterion with 6 lags maximum results indicates that differentiate the two series once the null hypothesis of the existence of unit root with probability 0.0052 and 0.0058. Indicating that the s series are integrated of order 1.

## B. Residual Serial Correlation LM Tests

VAR Residual Serial Correlation LM Tests

Null Hypothesis: no serial correlation at lag order h

Date: 04/27/11 Time: 10:24

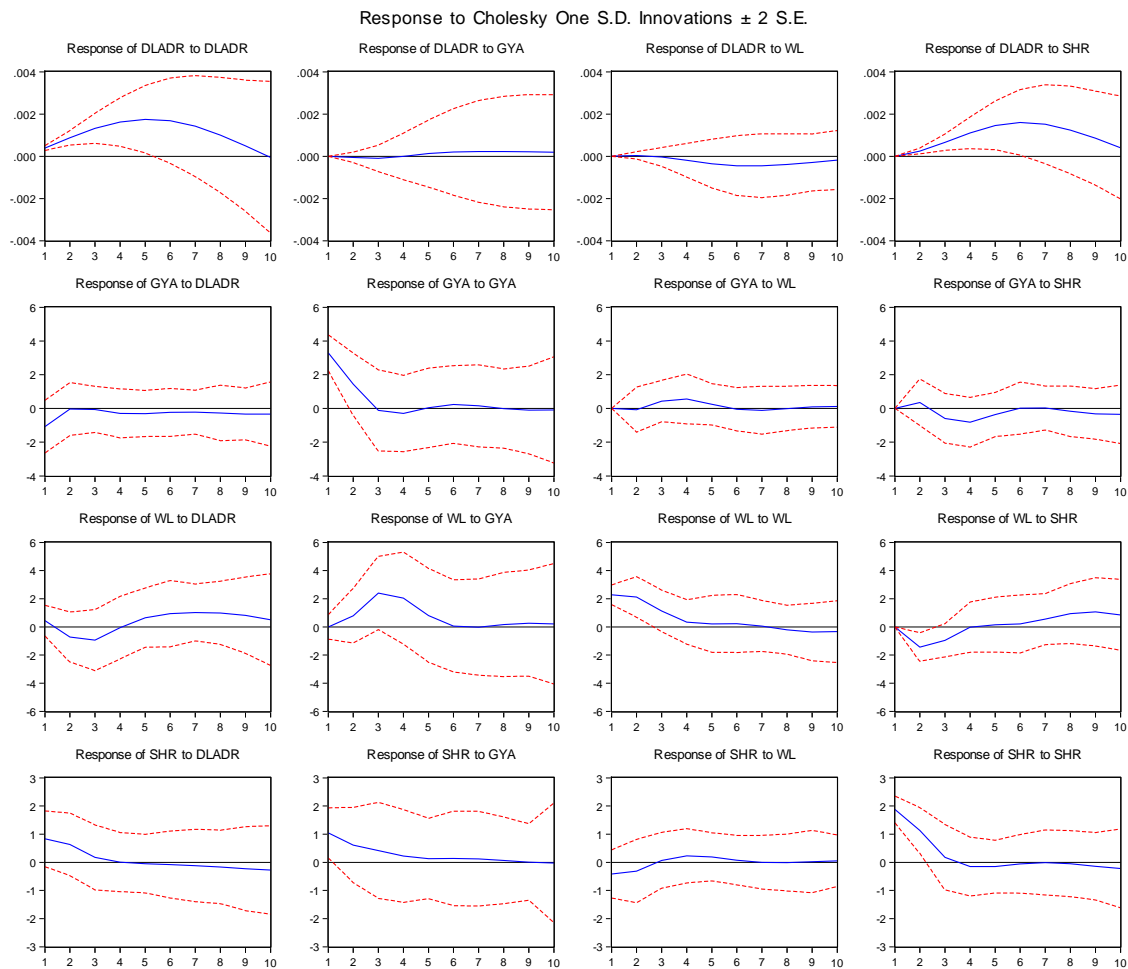
Sample: 1977 2009

Included observations: 30

| Lags | LM-Stat  | Prob   |
|------|----------|--------|
| 1    | 19.73238 | 0.2325 |
| 2    | 16.55960 | 0.4146 |

Probs from chi-square with 16 df.

## C. Impulse Response Functions



## D. An index of Undervaluation

### *An index of undervaluation and its effect on economic growth*

An index of undervaluation can be calculated in three stages, following the methodology of Rodrik (2008). First, calculate the real exchange rate (RER) using data from the exchange rate (XRAT) and conversion factors for purchasing power parity (PPP), as follows:

$$\ln RER = \ln\left(\frac{XRAT}{PPP}\right)$$

To adjust the exchange rate for the Balassa-Samuelson effect, in which non-tradable goods are cheaper in lower income countries regress the RER by GDP per capita (RGDPCH)

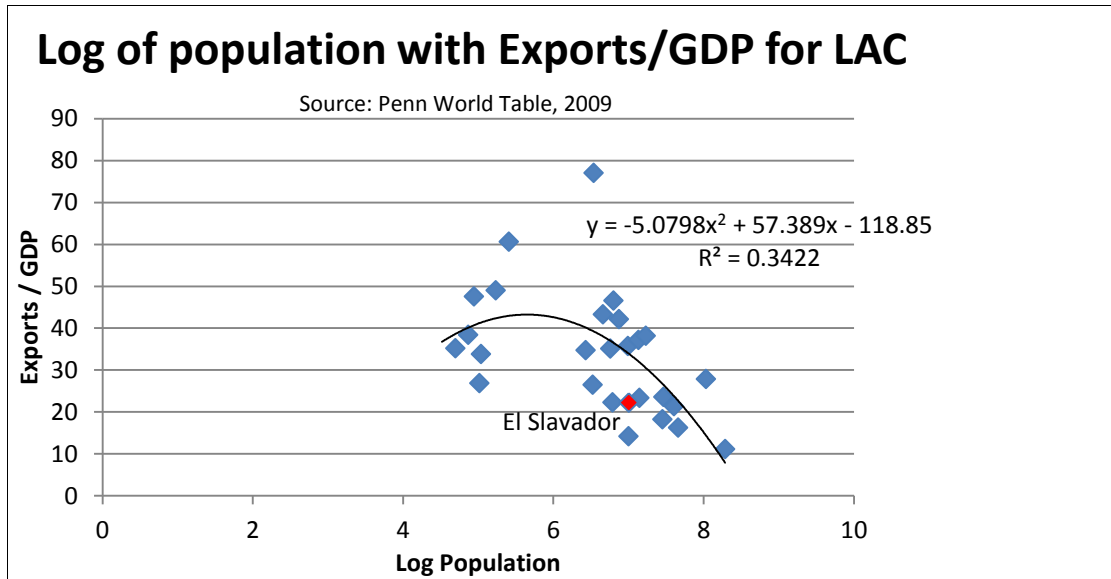
$$1 \quad \ln RER_t = \alpha + \beta \ln RGDPCH_t + u_t,$$

in which  $u_i$  are the residuals. Finally, to get the index of undervaluation, take the difference between the real exchange rate and the exchange rate adjusted for the Balassa-Samuelson effect:

$$(2) \quad \ln UNDERVAL_t = \ln RER_t - RER_t$$

Where  $RER_t$  is the estimated value in equation (1). The currency is undervalued if UNDERVAL is greater than one and overvalued if UNDERVAL is less than one.

## E. Population and Exports in LAC



Exports as a share of GDP illustrates a quadratic relationship with the log of population. El Salvador falls well below the trend; that is, the country has fewer exports than would be expected for its population level.

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