INTERNATIONAL MONETARY FUND

EL SALVADOR

SELECTED ISSUES

January 2015

This Selected Issues paper on El Salvador was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on November 25, 2014.

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INTERNATIONAL MONETARY FUND

EL SALVADOR

SELECTED ISSUES AND ANALYTICAL NOTES

November 25, 2014

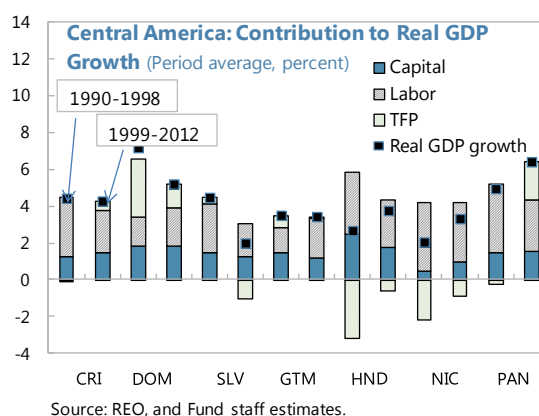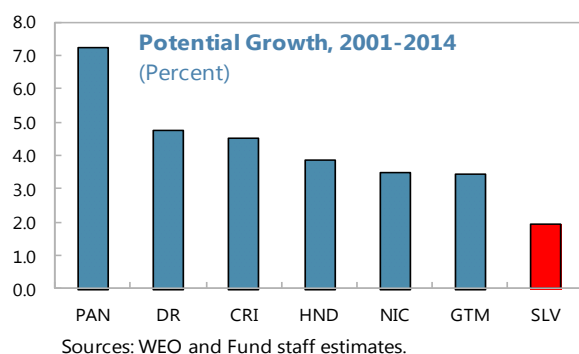| Approved By	Prepared by Heba Hany, Iulia Teodoru, and Joyce Wong (WHD)

CONTENTS

ASSESSING POTENTIAL OUTPUT[1]

Based on various filters and the production function approach, El Salvador's potential growth is estimated at about 2 percent for the period of 1999–2015, and the output gap is now virtually closed. Potential growth after the global financial crisis has fallen as a result of lower capital accumulation and total factor productivity (TFP). Going forward, it is critical to undertake structural reforms to strengthen capital and TFP to raise potential growth.

1.   **The level and growth of potential output are non-observable and are commonly defined in the literature as**: (i) the long-run rate of growth of real GDP after removing cyclical factors (statistical definition), which may be estimated through various de-trending methods; or (ii) the full-employment level of output and its corresponding maximum growth that is sustainable without rising or slowing inflation (Okun, 1970). This definition requires estimating the gap between actual and potential output, based on equilibrium employment and capacity utilization.

2.   **El Salvador's potential growth is the lowest in the Central American region and has been declining over time.** On average, El Salvador's potential growth is 2 percent for the period 1999–2015, compared with an average of about 4 percent in the region, excluding Panama. Factor accumulation has been the main contributor to potential growth in El Salvador, while TFP growth has been weakening it during 1999–2013.


Potential Growth, 2001-2014 (Percent)

Sources: WEO and Fund staff estimates.

Central America: Contribution to Real GDP Growth (Period average, percent)

Source: REO, and Fund staff estimates.

3.   **Potential growth slowed during 1991–2015, possibly due to several structural changes.[2]** More recently, it declined markedly from 2.6 percent before the global financial crisis
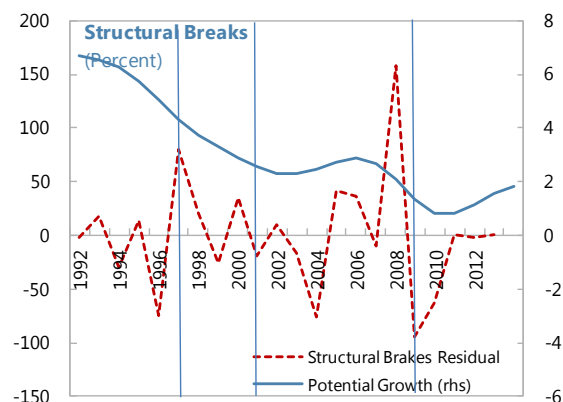
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[1] Prepared by Iulia Teodoru.

[2] Three different structural breakpoints were identified using an algorithm based on Bai (1997) and Bai & Perron (1998) to test for existence of multiple unknown structural breaks. The breakpoints were in 1997, 2001, and 2009. Although no causal inferences can be drawn from this exercise, these years correspond to the end of the economic rebound after civil war, the earthquake, and the global financial crisis, respectively. Natural disasters, such as the earthquake in 2001, can lower potential growth (direct and indirect costs over the period 1999–2013 have been estimated at over 20 percent of GDP, much higher compared to other countries in the region).

(GFC) of 2008–09 to 1.4 percent for 2011–14. Reduced contribution from capital formation (1.6 percent and 0.8 percent before and after the GFC, respectively) and negative TFP after the crisis (-1 percent) were the main drivers of the decline. Labor contribution to potential growth was higher after the crisis (1.3 percent vs. 1 percent before the crisis). For 2014, potential growth was estimated at about 1.7 percent.

Contributions to Potential GDP Growth (Percent)

Capital, Labor Force, Potential TFP, Potential GDP
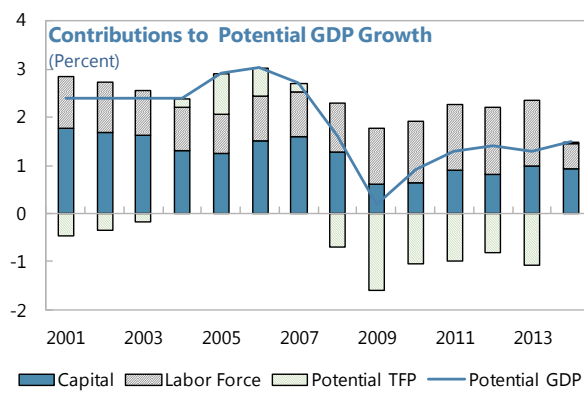
Source: WEO, ILO, UN, and Fund staff estimates.

Structural Breaks (Percent)

Structural Brakes Residual, Potential Growth (rhs)

Sources: Fund staff estimates.

Table 1. Potential Output Growth and Output Gap Estimates

Production Function Approach	Potential GDP Growth Rate				Output gap	
	1991-2015	1999-2015	2014	2015	2014	2015
	--	1.95	1.53	1.99	0.00	0.40
Cycle Extraction Filters	**Potential GDP Growth Rate**					
	1991–2015	1999–2015	2014	2015	2014	2015
Hodrick-Prescott	2.91	1.93	1.82	1.86	0.08	0.41
Butterworth	2.95	1.93	2.01	2.06	0.02	0.16
Christiano-Fitzgerald	2.84	1.86	1.46	1.93	0.43	0.69
Univariate and Multivariate Kalman Filters (UVF and MVF)	**Potential GDP Growth Rate**				*Output gap*	
	1991–2015	1999–2015	2014	2015	2014	2015
UVF	--	1.96	1.98	2.17	-0.38	-0.17
MVF: Phillips Curve and Okun's Law	--	1.95	1.53	1.99	0.00	0.40
Average of All Models	**2.90**	**1.93**	**1.72**	**2.00**	**0.03**	**0.32**

Source: Fund staff estimates.

4.   **TFP growth depends on technological progress, as well as the institutional, regulatory, and legal environment in which businesses operate.** TFP captures the efficiency with which labor and capital are combined to generate output, which, in turn, depends on businesses' ability to innovate, as well as an environment that fosters competition, removes unnecessary administrative burden, provides modern and efficient infrastructure, and allows easy access to finance. Productivity shortfalls in El Salvador may reflect, inter alia, lags in investment in R&D and adoption and development of new technologies (chart 7 in Figure 1). In addition, productivity gains are also hindered by a lack of competition and high market concentration as determined by the Herfindahl-Hirschman Index (also charts 6–8 in Figure 1). Weak business environment, including political and economic uncertainty, poor

New Firm and Market Concentration Density Across Countries

New firms per 1,000 working-age population (average 2004-2012)

Higher values of the Herfindahl Index are associated with higher market concentration

El Salvador

Average Herfindahl Index (available sectors), 2007-2010

Source: World Bank.

security, high red tape and corruption, lack of legal/judicial stability, poor infrastructure, and lack of access to financing (charts 4–5 in Figure 1) are additional factors. Fostering human capital and advanced education (which averages only 1.7 years) and the return of high-skilled El Salvadorans from abroad can also contribute to TFP growth.
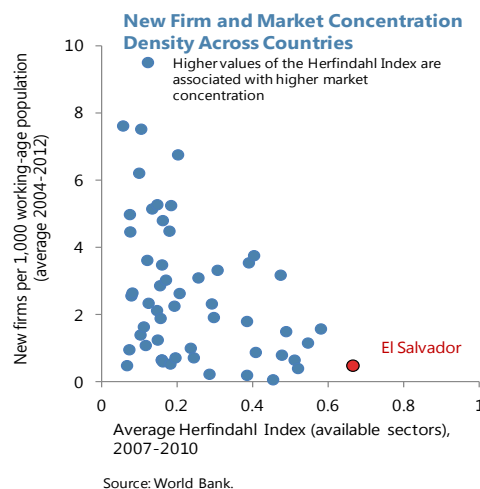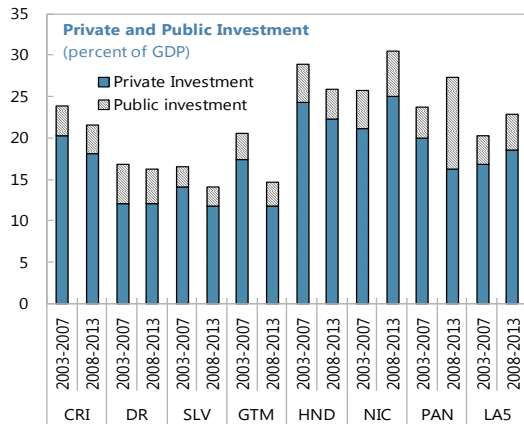
5.   **From a cyclical perspective, the economy is assessed to be operating at potential and labor market conditions also appear to be broadly neutral.** The non-accelerating inflation rate of unemployment (NAIRU) is estimated at 6.3 percent during 1999–2015 and the unemployment gap appears to have closed in 2014 (charts 5–6 in Figure 2). Supplementary indicators from the World Economic Forum-based surveys suggest certain labor market rigidities, including inefficiencies in wage determination, alignment of pay with productivity, capacity to retain talent (Figure 1), mismatches between skills and jobs, and high informality. Such indicators have informed estimates for the NAIRU, and the estimate for a closed unemployment gap in 2014. A positive output gap of one percent of potential output is associated with about a quarter percentage point reduction in the unemployment gap, which could create pressures on inflation and the external balance. A positive output gap of one percent is associated with about a 0.1 percentage point increase in inflation.

6.   **The estimated potential growth and NAIRU results should be interpreted with caution.** There are serious data limitations with respect to the labor market and capacity utilization. Also, the statistical filters have several shortcomings—identifying the appropriate value of the detrending parameter is difficult and estimates have an endpoint bias. As for the TFP measure, it is by definition a residual—the difference between potential growth and the quantity (and quality) of inputs. Thus, any measurement errors in the labor and capital series are automatically imputed to TFP. For instance, employment shifts from the formal to the informal sector, migration of skilled labor, changes in the quality of the capital and labor stocks which are not correctly accounted for, and changes in the level of capital utilization and the use of land would be reflected in TFP.

7.   **Strengthening capital and TFP growth going forward is critical to achieve the authorities' goal of raising potential growth to 3 percent over the medium term.** Structural reforms should prioritize mobilizing domestic savings to invest and build a higher capital stock, enhancing R&D/technological diffusion and competition in product and labor markets, strengthening institutions to secure property rights and reduce red tape, improving infrastructure, facilitating access to financing, and fostering human capital to boost TFP growth.

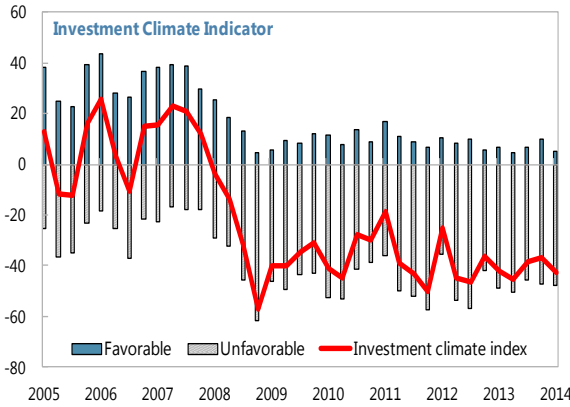## Figure 1. El Salvador: Investment, Competitiveness, and Human Capital

*Investment rates are low compared to the region and have declined.*

Private and Public Investment
(percent of GDP)

Saving rates are low.

Investment and Saving Rates, 2000–12
(percent of GDP)
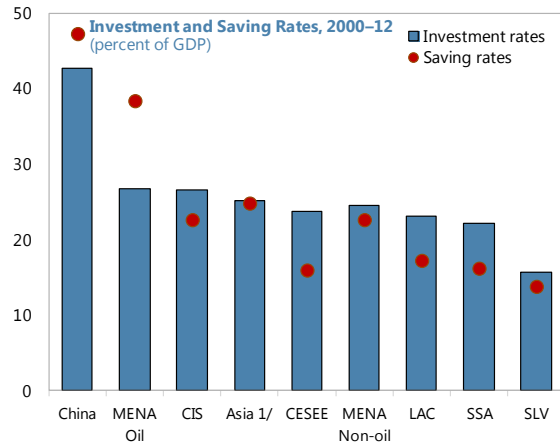
Business confidence has plummeted and a rebound in investment is hampered...

Investment Climate Indicator

...by policy uncertainty, crime, lack of judicial stability, and no fiscal discipline.

Factors Contributing to Unfavorable Investment Climate
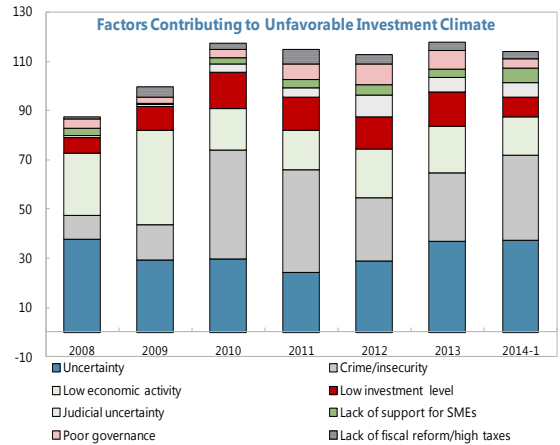
Business resilience is weak, given exposure to natural disasters, and supply chain risk from poor governance and infrastructure.

Resilience Index, 2014
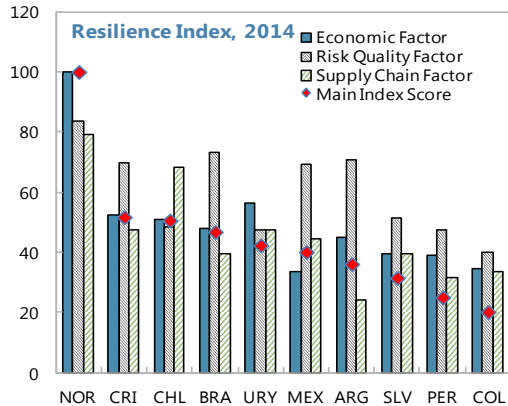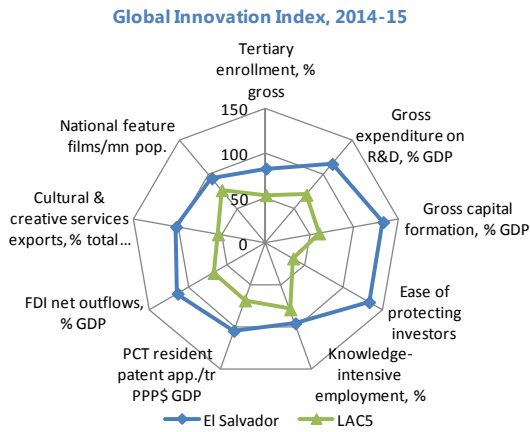

Competitiveness lags behind other LAC5 countries.

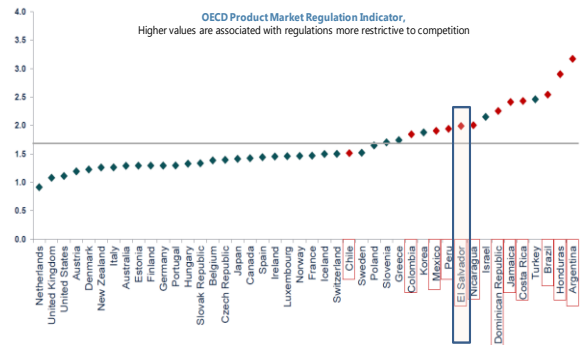**Global Competitiveness Index Ranking 2014-15**
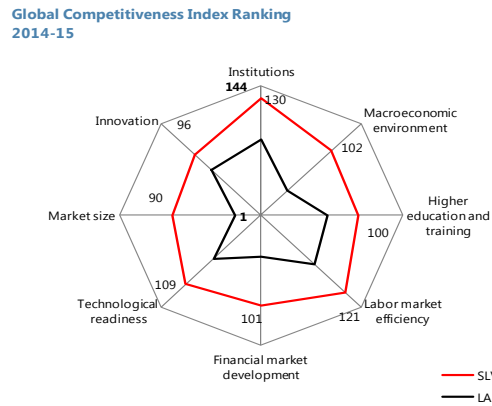
Source: World Economic Forum, Fusades, FM Global Resilience Index, and Fund staff estimates.
1/ Asia, excluding China.

Figure 1. El Salvador: Investment, Competitiveness, and Human Capital (continued)

Due to low R&D and weak protection of property rights...

Global Innovation Index, 2014-15

...product market regulations more restrictive to competition

OECD Product Market Regulation Indicator,
Higher values are associated with regulations more restrictive to competition

...some inefficiencies in wage determination, alignment of pay with productivity, and capacity to retain talent

Global Competitiveness Index: Labor Market Efficiency Ranking, 2014-15
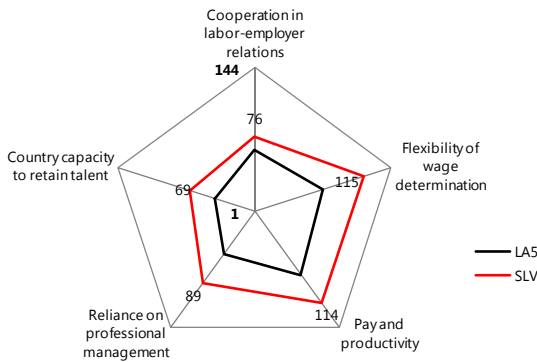
...and a human capital which could be further increased, while migration of skilled labor reversed.

Human Capital
(Average years of schooling, 2005-2012)
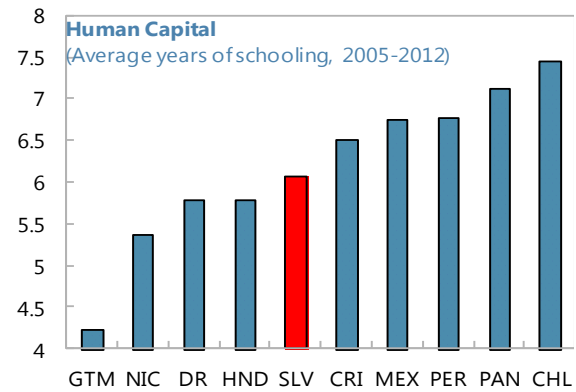
While unemployment rates have been falling after the global financial crisis, rates for men are higher compared to LAC5.

Unemployment Rate by Gender
(Percent)
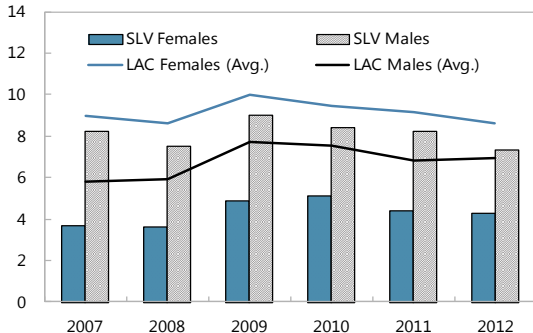
...but informal employment represents about half of total employment.

Formal vs Informal Employment in 2013, by Economic Activity (Number of People, thousands)
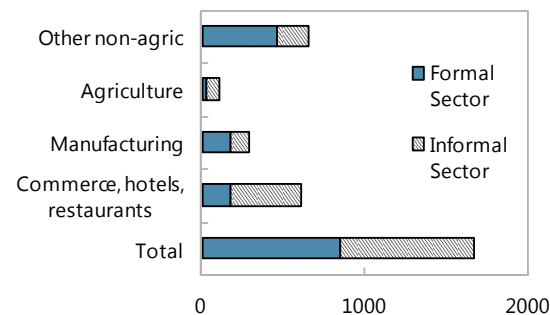
Source: Global Innovation Index, OECD Product Market Regulation Database, OECD-WBG Product Market Regulation Indicators for LAC, REO, World Bank Indicators, World Economic Forum, and Fund staff estimates.

Figure 2. El Salvador: Potential Output and Output Gap 1999–2014

Actual and Potential Output
(Log of GDP, x100)

Output Gap
LGDP
Potential LGDP

Actual and Potential Growth
(In percent)

Growth
Potential Growth

Output Gap and Headline Inflation
(In percent)

Headline Inflation
Output Gap

Headline, Tradables, and Nontradables Inflation 1/
(In percent)

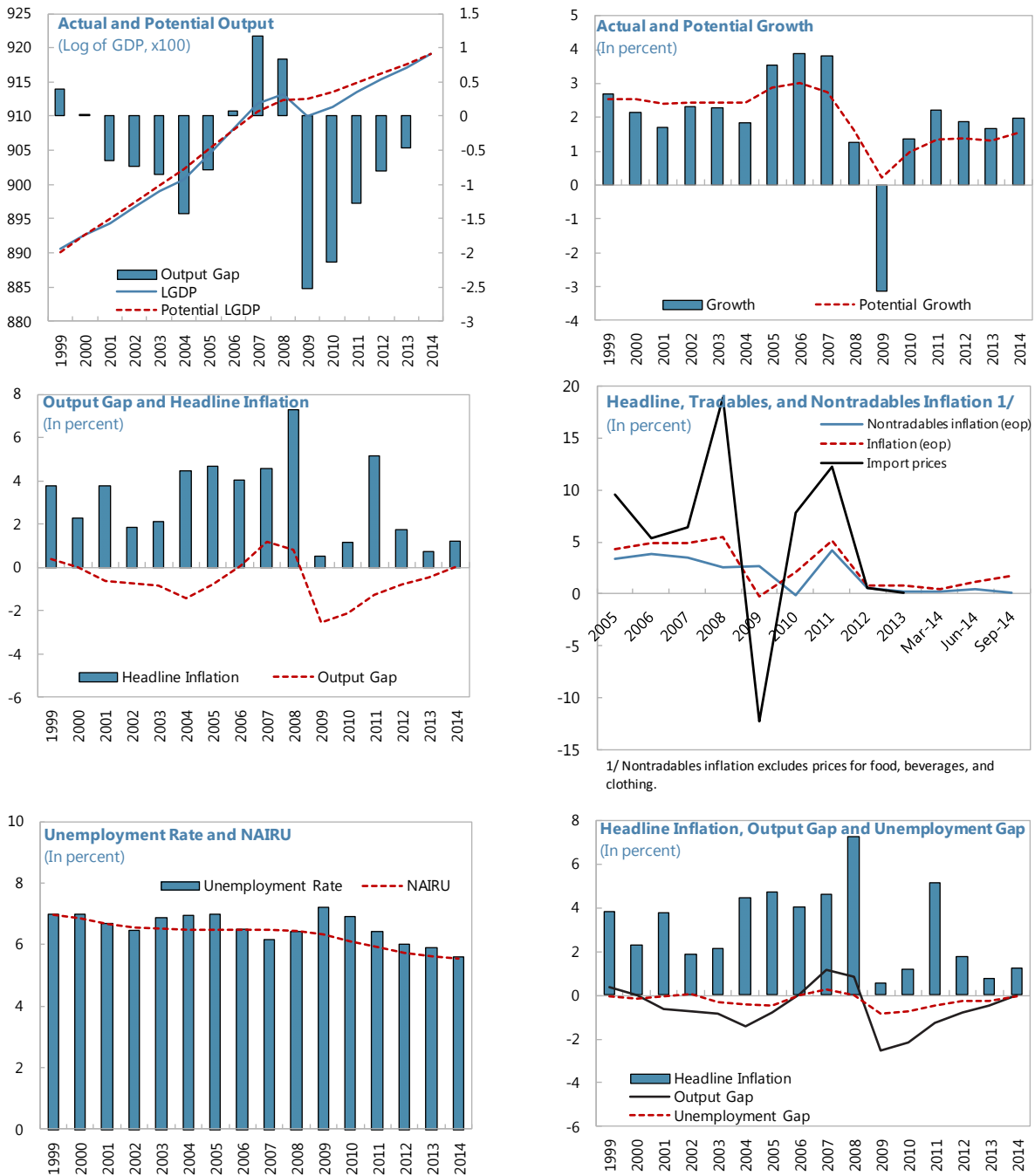Nontradables inflation (eop)
Inflation (eop)
Import prices

1/ Nontradables inflation excludes prices for food, beverages, and clothing.

Unemployment Rate and NAIRU
(In percent)

Unemployment Rate
NAIRU

Headline Inflation, Output Gap and Unemployment Gap
(In percent)

Headline Inflation
Output Gap
Unemployment Gap

Source: Fund staff estimates.

Box 1. Methodology Underlying Potential Growth Estimates

Following Benes and others (2010), potential output is estimated using a Bayesian methodology, namely the regularized maximum likelihood. The multivariate Kalman filter incorporates relevant empirical relationships between actual and potential GDP, including unemployment, and headline inflation. The model is applied to annual data from 1999-2019. The model is a standard macroeconomic model built on an output gap and an unemployment gap. These gaps are pinned down by a number of identifying equations, including an inflation equation that relates inflation to the output gap through a Phillips curve relationship, and an unemployment equation that estimates an Okun's law relationship.

1) Stochastic process for output:

$$\bar{Y}_t = \bar{Y}_{t-1} + G_t + \varepsilon_t^{\bar{Y}}$$

$$G_t = qG^{SS} + (1 - q)G_{t-1} + \varepsilon_t^G$$

$$y_t = f\,y_{t-1} + \varepsilon_t^y$$

2) Phillips curve equation

$$p_t = l\,p_{t+1} + (1 - l)p_{t-1} + by_t + \varepsilon_t^p$$

3) Okun's equation

$$u_t = t_1 y_t + t_2 u_{t-1} + \varepsilon_t^u$$

$$\bar{U}_t = G_t^{\bar{U}} + (1 - t_4)\bar{U}_{t-1} + t_4 U^{SS} + \varepsilon_t^{\bar{U}}$$

$$G_t^{\bar{U}} = (1 - t_3)G_{t-1}^{\bar{U}} + \varepsilon_t^{G^{\bar{U}}}$$

4) Inflation and growth expectations

$$p_{t+j}^C = p_{t+j} + \varepsilon_{t+j}^{p^C}, \quad j = 0, 1$$

$$GROWTH_{t+j}^C = GROWTH_{t+j} + \varepsilon_{t+j}^{GROWTH^C}, \quad j = 0, \tfrac{1}{4}, 5$$

where $\bar{Y}_t$ is the log of potential GDP at time t, G_t is an unobserved slope component given by a fixed growth rate in the steady-state, G^{SS}, and one of its lags. y_t is the output gap ($Y_t - \bar{Y}_t$), p_t is the headline inflation rate, u_t is the unemployment gap given by the NAIRU ($\bar{U}_t$) and the actual unemployment rate (U_t), $G_t^{\bar{U}}$ is an unobserved slope component and U^{SS} is a fixed steady-state unemployment rate. Finally, p_{t+j}^C and $GROWTH_{t+j}^C$ are the inflation expectations and output growth expectations at time t for the j-periods ahead. Shock terms include: to the level of potential output $\varepsilon_t^{\bar{Y}}$, to the growth rate of potential output ε_t^G, to the output gap ε_t^y, to inflation ε_t^p, to the unemployment gap ε_t^u, to the level of NAIRU $\varepsilon_t^{\bar{U}}$, to the growth rate of the NAIRU $\varepsilon_t^{G^{\bar{U}}}$.

The methodology requires taking a stance on prior beliefs regarding a number of variables. A key

Box 1. Methodology Underlying Potential Growth Estimates (concluded)

assumption fed into the model's estimation is that supply shocks are the primary source of real GDP fluctuations in El Salvador. The prior belief that supply is more volatile than demand leads the model to assign much of the observed volatility of real GDP to potential GDP fluctuations. In addition to the prior distributions of parameters, values for the steady-state (long-run) unemployment rate and potential GDP growth rates are provided, which were set at 5.3 percent (based on the trend decline in the unemployment rate since the GFC) and 2 percent, respectively.

After obtaining estimates of potential output and NAIRU from the multivariate Kalman filter, potential TFP is calculated as a residual in the Cobb-Douglas function:

$$A_t = Y_t / K_t^\alpha L_t^{1-\alpha}$$

where Y_t is potential output, K_t and L_t are capital and labor inputs, while A_t is the contribution of technology or TFP. Output elasticities (α is the capital share in the production function and is set at 0.35) sum up to one. Data on the working age population is obtained from the UN and the labor force participation rate is obtained from the ILO up to 2013 and assumed to grow at the 1999-2013 average annual rate thereafter. A labor force participation trend is calculated.

The capital stock series is constructed using a perpetual inventory method: $K_t = (1-\delta) K_{t-1} + I_t$ where the depreciation rate δ is set as 0.05, while the initial capital stock is computed as $K_0 = I^* / (g + \delta)$. I* is the benchmark investment and g is the average economic growth over 1999–2013.
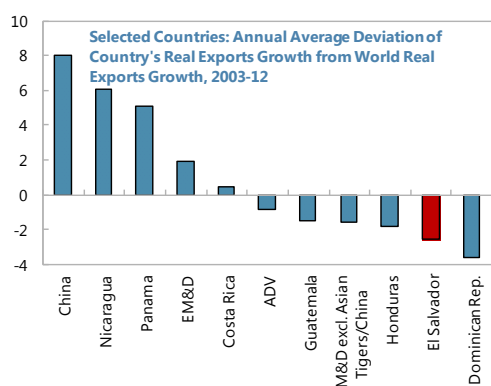
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Benes, J., Clinton, K., Garcia-Saltos, R., Johnson, M., Laxton, D., Machev, P., and Matheson, T., 2010, "Estimating Potential Output with a Multivariate Filter", IMF Working Paper 10/285, December (Washington: International Monetary Fund).

Benes, J., and N'Diaye, P., 2004, "A Multivariate Filter for Measuring Potential Output and the NAIRU: Application to The Czech Republic", IMF Working Paper, February (Washington: International Monetary Fund).

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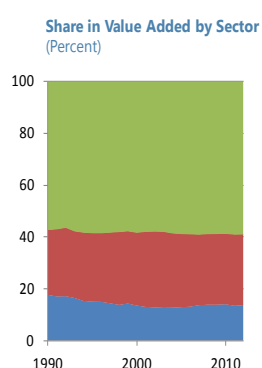
FOSTERING DIVERSIFICATION AND INTEGRATION[1]

El Salvador has limited domestic production and export diversification. Diversifying exports, deepening integration into global production chains, and raising quality and sophistication of exports would raise growth. Supportive policies could include improving infrastructure and trade networks, investing in human capital, encouraging financial deepening, and reducing barriers to entry for new products.
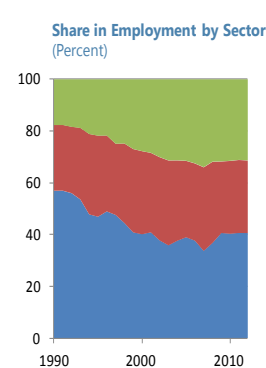
1. **Diversification and structural transformation influence macroeconomic performance and stability.** Both theory and empirics show that diversification in exports and domestic production foster economic growth (IMF, 2014; Papageorgiou and Spatafora, 2013). Increased diversification is also associated with lower output volatility. Diversification in output and employment is associated with higher income per capita until a country reaches advanced-economy status (Imbs and Wacziarg, 2003). As economies diversify their production, export diversification as measured by changes in the type and quality of export products also increases (Papageorgiou and Spatafora, 2012). This section focuses on El Salvador's potential for diversification in both exports (across products and partners) and in output, as well as increases in the quality of existing products.

Selected Countries: Annual Average Deviation of Country's Real Exports Growth from World Real Exports Growth, 2003-12

Sources: WEO and Fund staff estimates.

Share in Value Added by Sector (Percent)

Share in Employment by Sector (Percent)

Source: Central Bank of El Salvador.

2. **Limited domestic production diversification.** Since the 1990s, El Salvador's share of agriculture in output has declined significantly. The gap has been filled largely by low-productivity services/non-tradable activities, while the share of manufacturing has only slightly increased. Employment changes are similar to these structural changes (with employment declining in agriculture and rising in services).

3. **Loss of market share and limited export diversification.** El Salvador has lost market share over the past decade somewhat more than other countries in the region and emerging markets. El Salvador relies on a narrow range of export products. As a share of total exports, textiles, food, and knowledge intensive products amount to 40 percent, 28 percent, and 9 percent, respectively. It also

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[1] Prepared by Iulia Teodoru.

relies on a few export markets—the U.S. (47 percent share of exports) and CAPDR (33 percent). The comparative advantage of textiles has been rising from the early 1990s to the mid-2000s and has barely been maintained since then; the comparative advantage in food rapidly declined until 2002, with some modest recovery thereafter. The comparative advantage in consumer goods has been rising from the early 1990s to 2000, but has been flat thereafter, while the comparative advantage in raw materials has disappeared since the 1990s (Figure 1). El Salvador's real GDP growth could rise by up to 0.7 percentage points per year by improving logistics, increasing partner diversification, deepening integration into global production chains, and raising technological sophistication of exports to the levels of the five largest Latin American countries (and by up to 1.5 percentage points per year if it matches the EU in export structure and regional/global trade integration) (Medina Cas, Swiston, and Barrot, 2012).

Logistics Performance Index
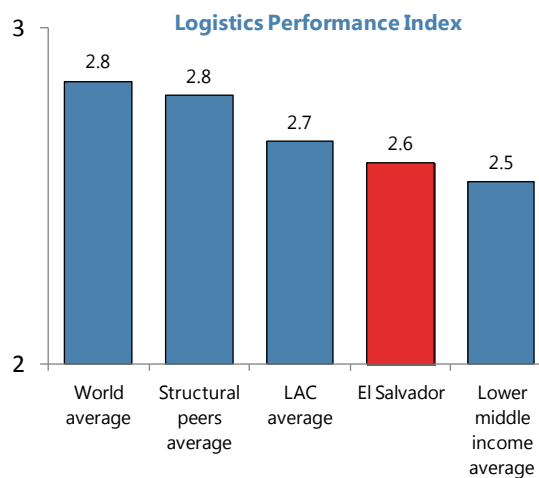
Source: World Bank.

4. **Scope to upgrade quality.** Small economic size and limited potential to exploit economies of scale may imply that the cost of moving into many new products is high, making quality upgrading within existing products a more feasible route to diversify. Producing higher quality varieties of existing products can build on existing comparative advantages and can boost export revenue potential through the use of more physical- and human-capital intensive production techniques. Thus, quality upgrading opportunities in El Salvador are strongest in manufacturing/ textiles and chemicals, but also exist in agriculture.
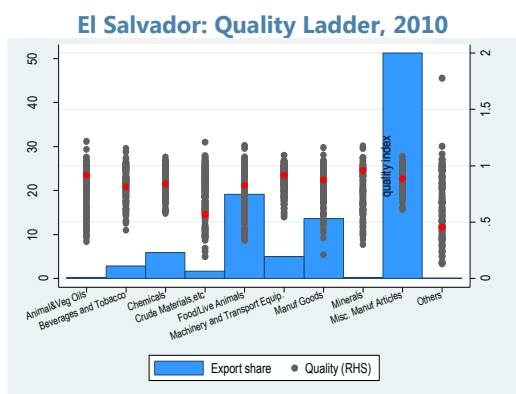
El Salvador: Quality Ladder, 2010

Source: UN Comtrade and Fund staff estimates.

El Salvador, Highest Export Shares and Quality Index
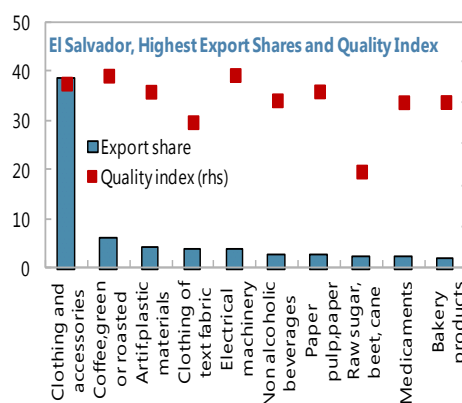
Source: UN Comtrade and Fund staff estimates.

Figure 1. El Salvador: Exports and Revealed Comparative Advantage

Textiles and food represent the largest share in exports, while the share of knowledge intensive products is small. Exports of textiles mostly go to the U.S., while Exports of knowledge intensive products to CAPDR. Consumer goods represent the largest share in exports, and they mostly go to the U.S. and CAPDR.

El Salvador. Exports by Country and Sector, 2012
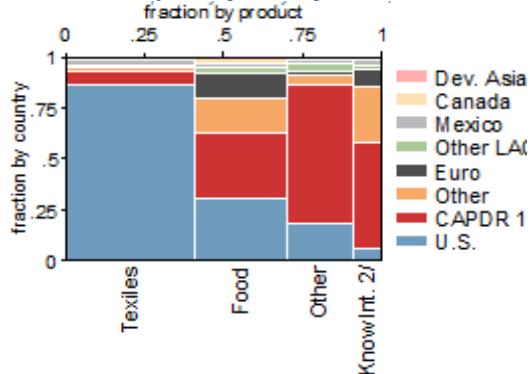
El Salvador. Exports by Country and Processing Stage, 2012
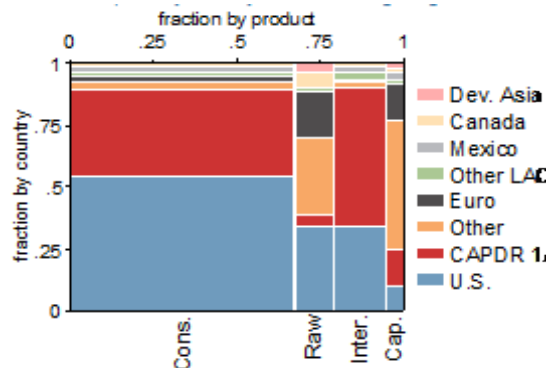
The comparative advantage of textiles has been rising until the mid-2000s and since then, has barely been maintained, while the comparative advantage in food has been declining. The comparative advantage of consumer goods has been rising until 2000 and has been flat since then.

Revealed Comparative Advantage (Exports by Sector)

Revealed Comparative Advantage (Exports by Processing Stage)
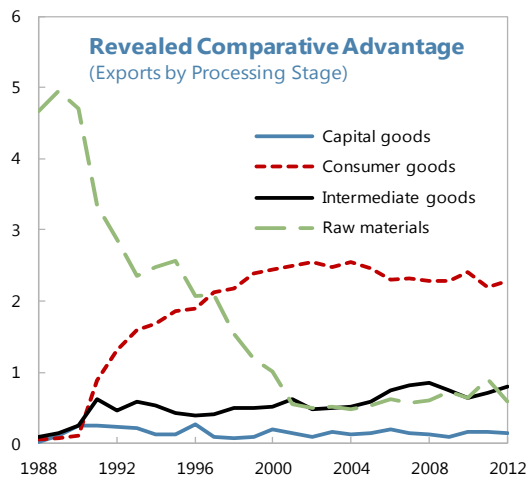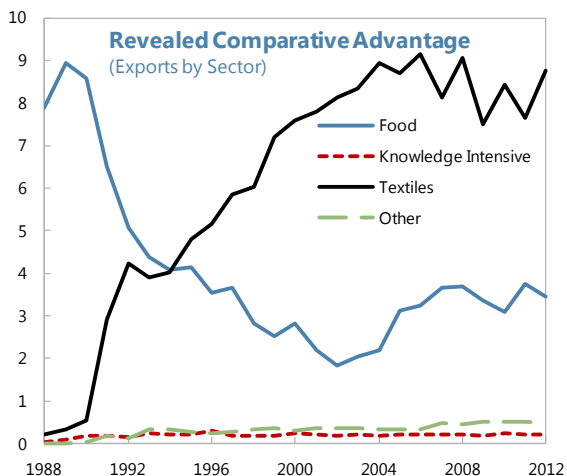
Source: WITS World Bank, UNSD Comtrade, and Fund staff estimates.

[1] Other CAPDR includes Costa Rica, Honduras, Nicaragua, El Salvador, Panama and the Dominican Republic.

[2] Knowledge Intensive products include transport, electrical equipment, machinery and chemicals.

[3] The stages of processing include capital goods, consumer goods, intermediate goods and raw materials.

[4] The Revealed Comparative Advantage index of country i for product j is measured by the product's share in the country's exports in relation to its share in world trade: $RCA_{ij} = \left(x_{ij}/X_{it} \right) / \left(xw_{j}/X_{wt} \right)$ Where X_{ij} and XW_{j} are the values of country i's exports of product j and world exports of product j and where X_{it} and X_{wt} refer to the country's total exports and world total exports. A value that exceeds unity implies that the country has a revealed comparative advantage in the product.

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INVESTMENT DRIVERS IN CENTRAL AMERICA: AN APPLICATION TO EL SALVADOR[1]

1. **Low domestic investment and FDI in El Salvador.** Average public and private investment in El Salvador during 2008-13 was only 2.4 and 11.7 percent of GDP, respectively, compared to 22.7 percent of GDP in CAPDR. Meanwhile, foreign direct investment averaged only 1.8 percent of GDP in this period, compared to the regional average of 4.8 percent of GDP.

2. **Growth diagnostic of crime and low productivity in tradables.** The US Partnership for Growth, in their 2011 constraints analysis of El Salvador (based on the Hausman, Rodrick and Velasco (2004) methodology) noted that nearly 11 percent of GDP is "spent or foregone due to crime" in El Salvador, nearly double the figure for Costa Rica. The report also cites low productivity in the tradables sector as a key impediment to private investment and growth. However, while crime is very high in El Salvador, it is more widespread in Honduras but does not appear to have a significant negative effect on investment in that country.

3. **Other potential drivers of private investment in El Salvador.** A panel regression is used to examine potential effects of variables such as inflation, public debt levels, human capital levels (proportion of the labor force with secondary school education), characteristics of exports (their level as percent of GDP and complexity) and institutional variables on investment in Central America. Among the latter, the regression includes a policy uncertainty variable constructed from a 5-year moving standard deviation of the government's primary balance, a variable for political uncertainty proxied by the frequency of elections, competitiveness scores, and economic institution quality indicators. Figure 1 provides a regional comparison for some of the variables. Annual data from 1995–2012 including all Central American countries (El Salvador, Costa Rica, Dominican Republic, Guatemala, Honduras, Nicaragua, and Panama) from the IMF, the World Bank World Development Indicators (WDI), MIT observatory of economic complexity, World Economic Forum (WEF) and International Country Risk Guide (ICRG) were used for the regression specification below:

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\begin{aligned}
Inv_t = \; & \alpha + \beta_1 XtoGDP_t + \beta_2 ExRate_t + \beta_3 Educ_t + \beta_4 Inf_t + \beta_5 Cmplx_{t-1} \\
& + \beta_6 VolatilityPB_t + \beta_7 Debt_t + \beta_8 Debt_t^2 + \beta_9 MoNoElec \\
& + \beta_{10} MoNoElec^2 + \beta_{11}(Open_t * Cmplx_{t-1}) + \beta_{12}(Debt_t * Cmplx_{t-1}) + \varepsilon_t
\end{aligned}
$$

where β_1 denotes the coefficient on exports as percent of GDP, β_2 the coefficient on the exchange rate regime, β_3 is the effect of education, β_4 the level of inflation, β_5 is the effect from the country's level of export complexity, β_6 captures the effect of the volatility of the primary balance, β_7 and β_8 effects from the level of debt (which is allowed to be a binomial in order to capture possible non-linear "threshold" effects like those identified by Reinhart and Rogoff (2010, 2011)), β_9 and β_{10}

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[1] Prepared by Joyce Wong and Heba Hany.

denote the effects from the duration of the electoral cycle (also allowed to be a binomial for possible non-linear effects), and finally, β_{11} and β_{12} are interactive coefficients between changes in openness and complexity index and changes in debt and complexity index, respectively.

4.   **Estimates and goodness of fit.** The text table below shows the estimated coefficients for each specification: (1) a baseline which controls for global conditions such as deviations of the U.S. GDP from trend and dotcom crisis and the global financial crisis using dummies in 2001 and 2009, (2) one which includes country fixed effects, (3) one which adds survey competitiveness scores and (4) one which replaces competitiveness scores with ICRG's measure for quality of institutions.[2] The time-series fit for El Salvador is relatively good up to 2006–07 when the country experienced a jump in investment driven by Bancolombia's purchase of Banco Agricola in December of that year (amounting to 4.5 percent of GDP).

Private Investment, data and model fit for El Salvador (percent of GDP)
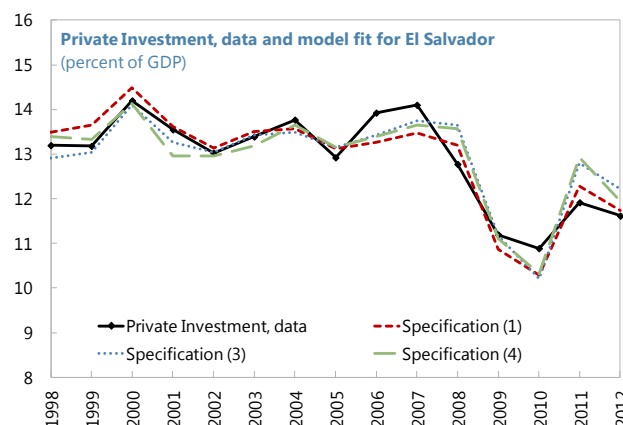
Source: Fund staff estimates.

The model also over-predicts both the slump and the recovery related to global financial crisis, partly driven by the protracted global slowdown post-crisis. Estimated coefficients are qualitatively similar across the first two specifications (with and without country fixed effects); one notable change is the fact that complexity becomes positive and significant on its own if country fixed effects are included. Both competitiveness and institutional quality measures have positive and significant effects but their inclusion (or the inclusion of fixed effects) undoes the significance of the education variable and some interactions of the complexity variable. This is likely because survey measures already incorporate certain aspects of these other variables included in the regression (e.g. competitiveness measures partially capture the quality of labor force).

5.   **Model implications.** Lowering the political uncertainty and increasing the educational level, competitiveness scores and economic institutions to regional levels could increase investment between 1 to 6 percent of GDP. The regression estimates suggest that, El Salvador's private investment level as a percent of GDP would be 3.6–5 percent higher if its electoral cycle was increased from the current average of 20 months to 47 months (the case of Guatemala, Honduras and Costa Rica). If the quality of institutions and competitiveness scores reached the levels in Costa Rica (best institutions in the region) or Panama (highest competitiveness score) then investment as proportion of GDP would increase by 1.2 percent of GDP and 5.8 percent of GDP, respectively. It is, however, noteworthy that—given competitiveness levels in the region are relatively low—a comparison with South Korea's competitiveness score illustrates that investment in El Salvador

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[2] A specification which included both the competitiveness score and the ICRG measure for quality of institutions was problematic due to the high correlation between those two measures.

would increase by 16 percent of GDP. Finally, an increase in education to the levels observed in Costa Rica (the highest in the region) would generate an increase in investment of about 2.3 percent of GDP.

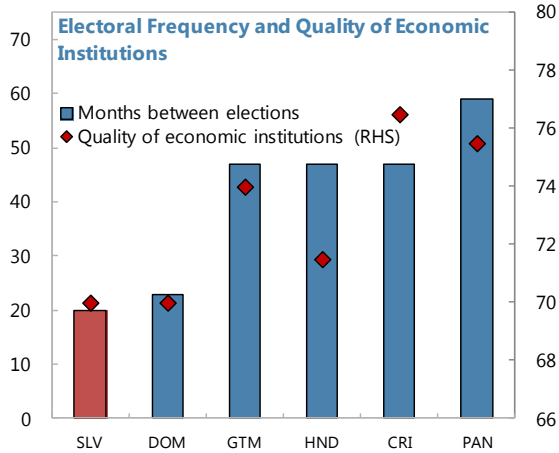| Table 1. Estimated Regression Coefficients				
Dependent variable: *Private investment (% of GDP)*	Baseline (1)	Fixed-Effects (2)	Competitiveness (3)	Institutions (4)
Open_t	**0.145***	**0.102***	**0.925***	**0.145***
	(0.0300)	(0.0235)	(0.295)	(0.0188)
ExRate_t	0.447	0.230	**0.535**	-0.329
	(0.336)	(0.591)	(0.239)	(0.238)
Educ_t	**0.0660**	-0.0216	0.0420	0.0365
	(0.0333)	(0.0779)	(0.0335)	(0.0386)
Debt_t	**-0.125**	**-0.242***	**-0.121**	**-0.130***
	(0.0521)	(0.0704)	(0.0600)	(0.0448)
$debt^2$_t	**0.000539***	**0.00106***	**0.000586**	**0.000590***
	(0.000183)	(0.000371)	(0.000238)	(0.000205)
Inflation_t	**-0.109**	**-0.101***	**-0.114**	**-0.0964**
	(0.0512)	(0.0288)	(0.0522)	(0.0385)
MoNoElec_t	**1.180***	**1.501***	**0.691**	**1.429***
	(0.319)	(0.515)	(0.327)	(0.265)
$MoNoElec^2$_t	**-0.0170***	**-0.0212***	**-0.00985**	**-0.0192***
	(0.00504)	(0.00788)	(0.00456)	(0.00368)
Complex_t-1	-0.428	**4.097**	0.640	1.596
	(1.596)	(1.753)	(2.092)	(1.466)
Open_t x Complex_t-1	**0.0290**	-0.0134	0.0184	0.0140
	(0.0130)	(0.0174)	(0.0132)	(0.0114)
Debt_t x Complex_t-1	**-0.0584***	**-0.0477**	-0.0622	**-0.0500***
	(0.0331)	(0.0185)	(0.0389)	(0.0277)
Financial_Crisis Dummy	-0.264	-0.509	-0.139	-0.207
	(0.654)	(0.677)	(0.669)	(0.579)
Dotcom_Bubble Dummy	**-1.375***	-1.417	-1.337	-1.425
	(0.706)	(1.037)	(0.818)	(0.907)
PolicyVolatility_t	0.235	0.335	0.604	0.570
	(0.508)	(0.494)	(0.566)	(0.623)
Competitiveness Score			**0.150**	
			(0.0710)	
Quality of Institutions				**0.230***
				(0.0766)
Constant	-11.69*		-64.80***	12.61
	(6.164)		(23.76)	(11.35)
Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)				

6.   **Economic fundamentals matter.** Higher openness and lower debt have positive effects on private investment which generate further positive effects when combined with a higher level of exports complexity. Exports of goods and services in El Salvador are only 24 percent of GDP. The model predicts that investment would increase between 5.1 to 7.3 percent of GDP if El Salvador's exports to GDP increased to the level of Honduras (33 percent of GDP), a country with an export structure similar to that of El Salvador which is heavy on textile maquila. If El Salvador's debt (the highest in the region) were to increase to 75 percent of GDP, then the model predicts a drop in investment of about 2.1 percent of GDP in all specifications. However, if debt were to decrease to 40 percent of GDP—which is the lower end of the estimated range for debt sustainability for El Salvador—then the increase in investment predicted by the model would be of 1.1 – 2.1 percent of GDP. The effects from increased openness and lower debt on investment interact positively with greater exports complexity. For most specifications, increasing complexity alone did not yield a large or significant effect on investment. This may be because a country's move to a high value-added

production model is more credible if it already has a relatively large and well-developed export base together with a certain expected level of macroeconomic stability. Thus, if this increase in complexity (e.g. to Panama-like levels) is accompanied by a higher openness level or a lower debt level, then investment would increase between 5.1 to 8.4 percent of GDP in the former case and between 1.8 and 2.6 percent in the latter. Finally, inflation is estimated to have a negative effect on investment. El Salvador has the lowest inflation rate in the region; if it were to increase to around 7 percent (the level of Nicaragua, the highest in the region) then the model predicts that investment would fall by 0.6 percent of GDP.
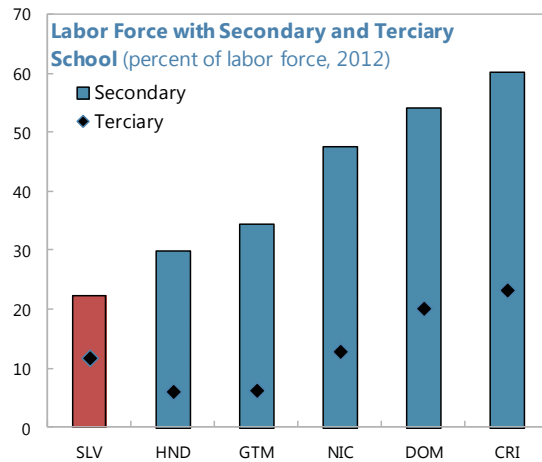
7.   **Main conclusions.** A simple panel regression for the drivers of investment in Central America, shows that variables such as education, openness and low levels of inflation have a positive effect on private investment. High levels of export complexity alone do not appear to correlate with private investment. Nevertheless, when an increase in complexity is coupled with either higher levels of openness or lower levels of debt, investment rises. Interestingly, the model also finds that lower political uncertainty has a positive impact on private investment. Finally, survey measures such as competitiveness also have a strong effect on investment.

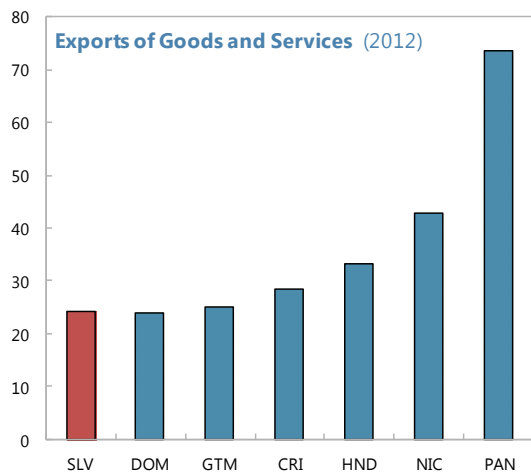## Figure 1. El Salvador: Elections, Human Capital and Exports

*El Salvador has frequent elections and low quality economic institutions...*

Electoral Frequency and Quality of Economic Institutions

- Months between elections
- ◆ Quality of economic institutions (RHS)

SLV DOM GTM HND CRI PAN

... while human capital levels are low in the labor force.

Labor Force with Secondary and Terciary School (percent of labor force, 2012)

- Secondary
- ◆ Terciary

SLV HND GTM NIC DOM CRI

Exports are relatively low as percent of GDP...

Exports of Goods and Services (2012)

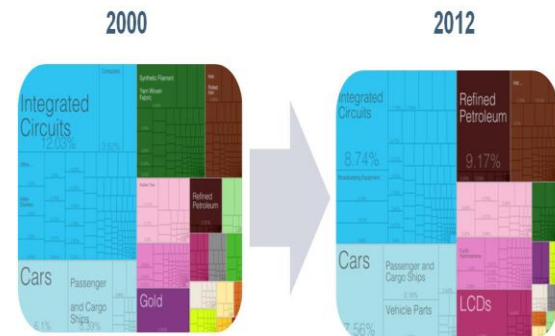SLV DOM GTM CRI HND NIC PAN

... and their structure has remained mostly unchanged in the last decade.

2000   2012
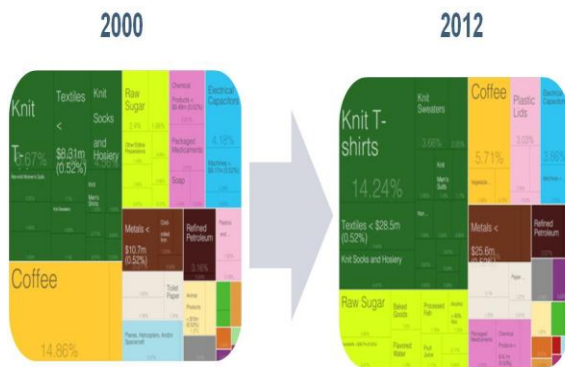
Whereas the export structure of neighbors like Costa Rica moved to higher value-added goods like circuitry and mechanical parts...

2000   2012
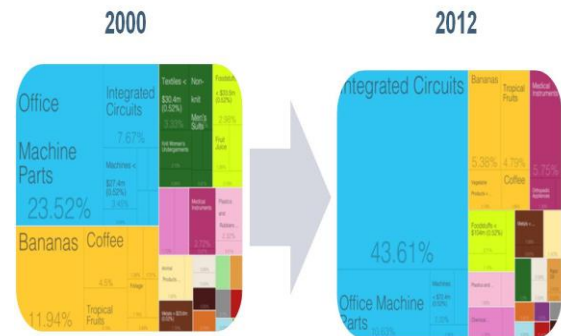
... and countries like South Korea moved into electronics.

2000   2012

Source: ICRG, MIT Observatory of Economic Complexity, World Bank WDI and Fund staff estimates.

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