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Twin Deficits and External Constraints in a Dollarized Economy: A Stock-Flow Consistent Exercise for Smaller Economies with an Application to El Salvador

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ABSTRACT

This paper develops a stock-flow consistent (SFC) exercise for a smaller and dollarized economy and applies it to the case of El Salvador. Against the backdrop of the 2025 IMF-supported fiscal adjustment program, we reassess the origins of rising public debt and persistent external deficits within a unified sectoral balances framework. In particular, we show the importance of remittances and terms-of-trade effects to capture the structural determinants of the Salvadorian economy. We then reassess the impact of the IMF program within our framework. As exemplified by the case of El Salvador, smaller economies are characterized by persistent twin deficits. Within a stock-flow consistent framework, this sets the stage to analyze the dynamics of the economy of El Salvador in terms of the interaction between the fiscal stance and foreign trade performance ratio. The analysis underscores the centrality of the external constraint in shaping growth and debt trajectories and offers a coherent macro-financial framework for evaluating policy trade-offs in dollarized economies.

KEYWORDS: dollarization; stock-flow consistent models; sectoral balances; external constraint; fiscal policy.

JEL CODES: E12; E62; F32; F41.

1. INTRODUCTION

Over the past four decades, many emerging and developing economies have experienced recurrent episodes of fiscal and external disequilibrium and instability. These episodes have often been accompanied by stabilization programs aimed at restoring macroeconomic balance through fiscal consolidation, structural reforms, and measures to improve external competitiveness. While such programs are generally motivated by concerns over public debt sustainability, they are frequently implemented in economies where fiscal imbalances are closely intertwined with structural external constraints and imbalances. In fact, smaller economies are characterized by persistent twin deficits and the external imbalance tends to mirror the fiscal deficit.

Within this context, the evolution of public finances cannot be understood independently of the position of the balance of payments, which in turn is a function of productive specialization. This is particularly true for dollarized economies, where the absence of independent monetary policy and the institutional features of the financial sector pose a significant challenge to economic policy implementation.

El Salvador represents one of the clearest examples of these challenges. Since the adoption of the US dollar as legal tender in 2001, the country has operated without conventional monetary policy instruments or exchange rate flexibility. This has implied an increase in the importance of fiscal policy and external financing as the principal adjustment mechanisms. At the same time, the Salvadoran economy has been characterized by persistent current account deficits, a narrow productive structure, relatively weak export performance, and a growing dependence on workers' remittances as a source of foreign exchange. These structural characteristics have contributed to the accumulation of public debt and have heightened concerns regarding macroeconomic sustainability, culminating in the fiscal adjustment program supported by the International Monetary Fund (IMF) in 2025.

This paper argues that understanding the macroeconomic challenges faced by El Salvador requires a unified framework capable of simultaneously tracking the financial positions of

households, firms, government, and the rest of the world. We argue that the stock-flow consistent (SFC) approach (Godley and Cripps 1983; Godley 1999; Nikiforos and Zezza 2017; Zezza and Zezza 2019) is well suited to do this and to disentangle the twin deficit relationship. However, for the most part the stock-flow consistent (SFC) literature has analyzed the twin deficit situation as a particular and transitory situation rather than as a structural feature of economies such as those of smaller economies.

The stock-flow consistent (SFC) methodology has been used extensively for the analysis of dollarized economies (Izurieta 2002; Missaglia 2021; Llerena Sarzosa and Rosales Pallasco 2026) as it explicitly captures the interactions between fiscal policy, private sector behavior, external financing, and the accumulation of financial assets and liabilities over time. This framework also offers an alternative to the traditional “twin deficit” framework, which assumes full employment of resources and fiscal deficits financed by expansions of the domestic money supply.

The analysis offers three main contributions. First, it develops one of the first empirical SFC exercises specifically designed for El Salvador. Second, it provides a coherent macro-financial framework for reassessing the origins of rising public debt by showing that fiscal outcomes are inseparable from persistent external deficits and the country's dependence on foreign capital and remittance inflows. To this end, it develops the theoretical and empirical analysis of the relationship between the fiscal stance and the foreign trade performance ratio. Third, it evaluates the macroeconomic implications of the 2025 IMF-supported adjustment program within a framework that explicitly incorporates stock-flow interactions and external constraints, thereby providing a richer assessment of the policy trade-offs associated with fiscal consolidation under dollarization.

The remainder of the paper is organized as follows. Section 2 presents some stylized facts for the economics of El Salvador in the recent years. Section 3 provides a quick snapshot of the literature on stock-flow consistent modelling for the case of smaller economies. Section 4 presents our theoretical framework as Section 5 discusses the calibration strategy. Section 6

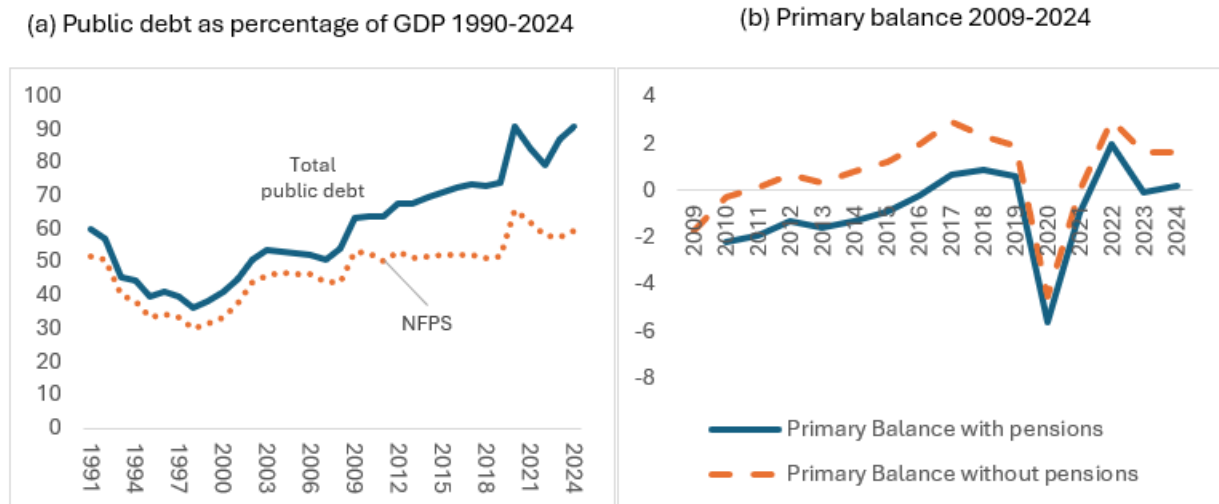
presents the simulation scenario and analyzes the effects of the 2025 IMF-supported fiscal adjustment program on macroeconomic and financial dynamics. Section 7 concludes.

2. STYLIZED FACTS

In February 2025, El Salvador and the IMF Executive Board approved a 40-month extended arrangement under the Extended Fund Facility (EFF) for around US\$1.4 billion (approximately 4.0 percent of 2024 GDP). The arrangement aims to improve public debt sustainability and the central bank's international reserves. In this sense, 60 percent of the program will be used for budget support, while the remaining 40 percent will be allocated to the central bank's international reserves. The government of El Salvador committed to achieving a primary surplus of 1.9 percent of GDP in 2025 and a “steady-state” surplus of 3.7 percent of GDP by 2027 (IMF 2025). The IMF expects that the agreement will also facilitate additional multilateral financial support for US\$ 3.5 billion. The arrangement occurred when El Salvador’s government was having difficulties acquiring external debt at a low rate of interest, the price of the government bonds was falling, and international reserves were below the IMF standards (Álvarez 2024).

The public debt as a percentage of the GDP in El Salvador has exhibited a growth tendency since 1998, as the panel (a) of Figure 1 shows. This increasing behavior is connected to specific economic reforms such as those of the pension system (Barrera & Álvarez 2018; Argueta and Hernandez 2024). Panel (b) of Figure 1 shows the relevance of the pension debt in recent years; while the primary balances without pensions of the non-financial public sector have been positive, except for years associated with economic crisis (i.e. 2009 and 2020), the primary balances with pensions report only five years with surplus in the same period. This figure also shows how ambitious the agreement for El Salvador with the IMF is—the highest primary surplus with pension was 2.0 percent of the GDP in 2022, still far away from the 3.7 percent that the program is aiming for in 2027.

Figure 1. Fiscal Balance



Source: Banco Central de Reservas

The pension system is not the only potential explanation for the increase in debt-to-GDP ratio. According to Hernandez and Trejo (2024), the rising behavior of this ratio began with the slowdown in the growth rate of the Salvadoran economy following the post-civil war boom between 1990 and 1995. In the same line, Alvarado and Cabrera (2013), Álvarez et al. (2018), Argueta and Hernández (2024), and Montesino and López (2024) provide empirical evidence in favor of the argument that, in El Salvador, the high level of public debt to GDP is associated with low rates of economic growth. Panel (a) of Figure 1 also shows that, although at a slower pace, the public debt of the NFPS without pensions also increased between 1990 and 2024.

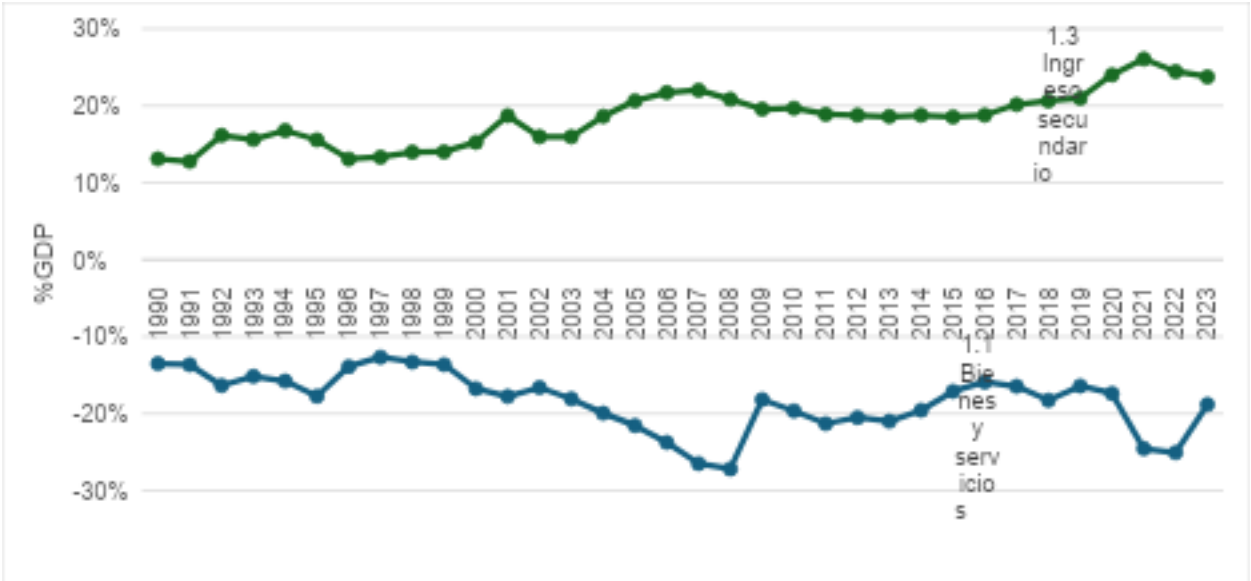
As in most of the Latin American economies in the 1990s—although with its peculiarities as highlighted by Segovia (2021)—El Salvador started a series of economic reform including free trade agreements and unilateral reduction of tariffs, deregulation and liberalization of markets, reduction on El Salvador government active role in the economy, and an increasingly regressive taxation (Barrientos 2015; Segovia 2021; Cabrera 2022; Pleités 2022).

El Salvador was coming from a civil war in the 1980s. Between 1980 and 1989, the economy had an average growth rate of -1.9 percent. The accelerated trade liberalization under this context has been translated into a structural and growing trade deficit, as shown in panel (a) of

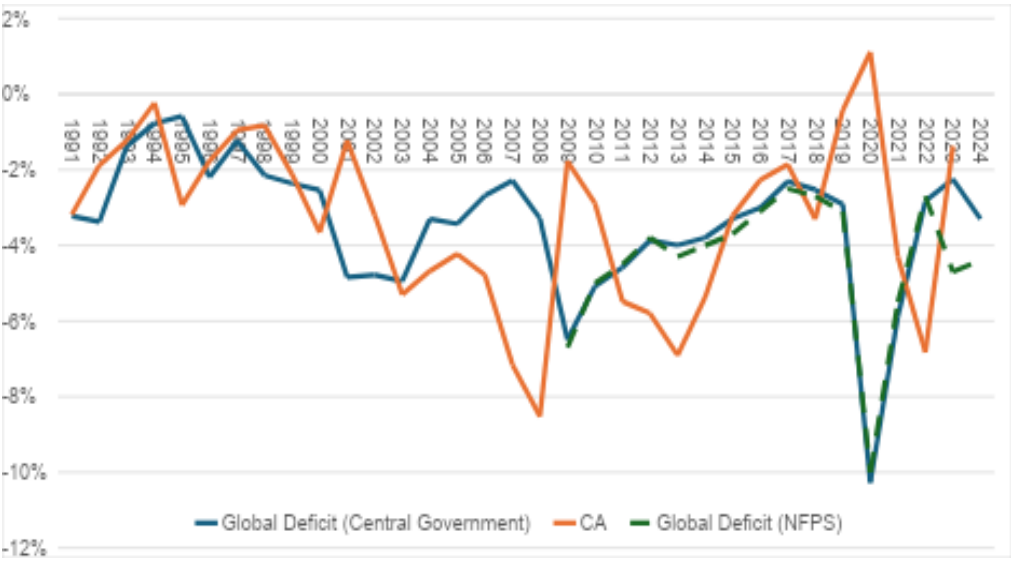
Figure 2. From the current account perspective, the sustained and elevated trade deficit has only been possible given the increasing participation of remittances in the Salvadorean Economy, as the same figure shows.

Figure 2. External Balance

(a) Trade deficit and remittances



(b) Current account Central Government and Non-Financial Public Sector global balance



Source: Banco Central de Reservas

However, the flow of remittances has not been enough to consolidate a positive current account. Between 1990 and 2023, El Salvador registered just one year of a current account surplus, and the deficit was, on average, 3.3 percent of GDP, as panel (b) of Figure 2 shows.

Note also in panel (b) that the current account deficit has been accompanied by a global deficit of both the central government and the NFPS. The traditional interpretation of these “twin deficits” is that when a public deficit is financed by domestic money creation, under the assumption of full employment of resources, the expansion of the aggregate demand is translated into an external deficit (Ocampo, Rada & Taylor 2009, 76)

The dollarization in El Salvador was done with similar arguments. According to Manuel Hinds, the main Salvadoran government advisor for dollarization, when the fiscal deficit is financed by the central bank in developing countries, the expansion of the aggregate demand increases the price of the non-tradable goods, raising the cost of the tradable goods, which appreciates the real exchange rate. This reduction in competitiveness is translated into an increasing trade deficit and a reduction in international reserves. The potential nominal devaluation to correct this behavior is translated into higher prices, given the low level of diversification in these economies and the necessity to import. Higher prices imply, once again, an appreciation of the real exchange rate, and the economy enters a vicious cycle that pushes the economy into macroeconomic imbalances and inflation. Economic agents try to avoid this uncertainty by demanding a foreign currency, which only reinforces the nominal depreciation. Dollarization, according to Hinds (1999; 2006), is the best option to avoid these macroeconomic imbalances, reduce inflation, lower the interest rate, and attract investment. Moreover, with the dollarization:

The realities of fiscal policies would become too transparent, and all wisdom would collapse to a simple dictum: Do not spend more than you earn in the long term. This dictum is insultingly identical to that which governs lower worlds, those of businesses and average citizens. Everybody would understand the finances of the government and the country. Financial crises would not be associated with currency crises. The thrill of macroeconomics would go. (Hinds 2006, 48).

Hinds (2006) understands that any macroeconomic imbalance in a dollarized economy is coming from the public sector, and the fiscal adjustment agreed between El Salvador’s government and the IMF is an expression of his simple dictum “do not spend more than you earn in the long

term.” According to Hinds (2006, 83), “[i]f the economy is close to full employment, or if the composition of the new demand is different from that of domestic production, the excess purchasing power spills over the balance of payments and the country runs a current account deficit.” The hypothesis of being close to full employment could be discarded in a country where self-employment has been historically above 35 percent of total employment, according to the World Development Indicators database. Moreover, Hinds supported the accelerated trade liberalization of the 1990s, which partly explains the low level of diversification and tertiarization of the Salvadoran economy (Góchez 2011; Álvarez 2024), as well as the inability to translate expansions in aggregate demand into higher levels of employment and output.

Investment was expected to drive economic growth after dollarization, as Hinds (2006) argued, due to reduced uncertainty regarding exchange rate fluctuations, along with lower inflation and interest rates. Although both inflation and the active interest rate declined following dollarization, this did not lead to higher investment, nor to stronger economic growth compared to the rest of Central America (Moreno-Brid, Morales-López, and Pérez-Medina 2025), nor to a higher rate of capital accumulation—particularly in the tradable goods sector, which offers fewer incentives than non-tradable sectors (Álvarez 2024).

As highlighted by Carlos Glower, one of the main academic voices opposing dollarization in El Salvador, in economic debates (and as noted by Hinds [2006] as shown above), the country's situation has been framed solely as a fiscal problem, without adequately considering structural factors such as competitiveness issues and the limited capacity to generate foreign currency (Glower 2013 26). This vision reduces potential solutions for the Salvadoran economy to fiscal consolidation, as the agreement with the IMF shows.

3. LITERATURE REVIEW

In contrast to this prevailing interpretation, we propose an alternative diagnostic of El Salvador's post-dollarization performance by employing a stock-flow consistent (SFC) model.

The stock-flow consistent (SFC) literature on dollarized and small and smaller economies provides a coherent analytical framework to understand the joint determination of growth, sectoral balances, and financial stability under conditions of external constraint and limited policy autonomy. Izurieta (2002; 2003) argues that dollarization imposes a “tight rein” on fiscal policy: governments are unable to rely on monetary financing and must adjust spending in line with external conditions, often leading either to recessionary outcomes or to unsustainable debt accumulation. These results reinforce earlier concerns, such as those raised by Godley (1999), regarding the absence of adjustment mechanisms in systems that constrain macroeconomic policy at the national level. A central insight of this literature is thus that macroeconomic outcomes cannot be understood in isolation from the interaction between the government, private, and external sectors, as emphasized by Pérez Caldentey (2009). In his application to CARICOM economies—which as in the case of El Salvador are characterized by recurrent twin deficits—persistent patterns of low growth, fiscal deficits, and current account imbalances are shown to be mutually reinforcing with the balance of payments acting as a binding constraint on expansion.

Subsequent contributions have extended this framework both theoretically and empirically. Baltodano (2017) integrates alternative model closures within an SFC structure, showing that while long-run growth in Central American economies may be supply-driven, short-run dynamics reflect a combination of demand and supply factors. His empirical findings, based on time-varying parameter techniques and Granger causality tests, suggest that the external sector and productivity constraints jointly shape macroeconomic adjustment. Applied empirical SFC models emphasize the importance of tailoring model structures to country-specific institutional features including the composition of financial assets and sectoral balance sheets (Nikiforos and Zezza 2015). Zezza and Zezza (2019) stress that empirical SFC modeling must be grounded in a careful reconstruction of national accounts and flow-of-funds data, ensuring consistency between theoretical structures and observed economic relationships. These models typically incorporate multiple institutional sectors and a rich financial architecture, allowing for a detailed representation of transmission mechanisms between flows (income, expenditure) and stocks (debt, assets), which is essential for analyzing both medium- and long-term scenarios such as the ecological transition in financially constrained small and smaller economies (Nalin et al. 2024).

Within this broader framework, the literature on dollarized economies highlights additional structural vulnerabilities arising from the loss of monetary sovereignty. Contributions such as Missaglia (2021) demonstrate, within a Keynesian-Kaleckian SFC setting, that dollarization tends to reduce the steady-state growth rate and increase macroeconomic instability, primarily because it constrains the policy space available to respond to shocks. Additional contributions further explore the institutional and behavioral dimensions of dollarized systems. Fernández (2017) examines the sustainability of dollarization in Ecuador, emphasizing the importance of fiscal and external balances in maintaining stability, while highlighting the role of policy scenarios within an SFC framework. Llerena Sarsoza and Rosales Pallasco (2026) extend this analysis by incorporating liquidity preference into a dollarized SFC growth model, showing how shifts in households' portfolio choices—particularly between cash and deposits—can amplify instability and constrain policy effectiveness. At the empirical level, studies such as Alvarado and Melgar (2013) document the evolution of fiscal deficits and public debt in El Salvador, linking weak growth performance to persistent fiscal imbalances within a dollarized regime. This body of literature converges on a common conclusion: in small, open, and especially dollarized economies, growth and stability are tightly constrained by external balances and the interaction of sectoral financial positions. The absence of monetary sovereignty magnifies these constraints, making the coordination between fiscal policy, external performance, and private sector behavior a central determinant of macroeconomic outcomes. This paper expands and complements the existing literature by showing the interaction between the fiscal stance and foreign trade performance ratio and that, in the case of smaller economies characterized by twin deficits, the exogenous variables of our exercise (exports, government expenditure and the terms-of-trade) drive income and output as well as the net acquisition of assets by the private sector.

4. THEORETICAL FRAMEWORK

The existence of twin deficits can be explained based on an analysis of the structure of aggregate demand through the financial balances of the three main sectors of an economy: the central government (BF_g), the private sector (BF_{pr}), and the external sector (BF_{ex}).¹

Financial balances are formally derived from national account identities, so that the level of national income (Y), which is the sum of the income of the central government and the private sector (Y_g, Y_{pr}), is equal to private sector spending (P_{pr}) government consumption (G) and the external balance (B) defined as the difference between exports (X) and imports (M) of goods and services, that is,

$$(1) Y \equiv Y_{pr} + Y_g \equiv P_{pr} + G + B$$

Note that equation (1) reflects the resource balance of the economy, that is that total savings (S) is generated by excess income over expenditure and of imports over exports (*i.e.*, $S \equiv Y - P_{pr} - G - B$).

Sequentially subtracting the income levels of the non-financial and public corporate sector on both sides of the identity equation (1), we obtain that:

$$(2) Y_{pr} + Y_g - Y_g = P_{pr} + G - Y_g + B$$

$$(3) Y_{pr} - P_{pr} = P_{pr} - P_{pr} + G - Y_g + B$$

$$(4) Y_{pr} - P_{pr} = G - Y_g + B \Leftrightarrow BF_{pr} = BF_g + B$$

According to equation (4) the difference between the income and expenditure of the private sector (or the financial balance of this sector $Y_{pr} - P_{pr}$) (BF_{pr}) is equal to the sum of the central

¹ This is based on Godley and Cripps (1983).

government's fiscal balance ($G - Y_g$) or the financial balance of the public sector (BF_g) and the external financial balance (B).

Equation (4) can be expressed in real terms, allowing for the inclusion of the terms-of-trade effect as part of the external financial balance (B). Formally, $B = (x - m) + TR + x \frac{(P_x - P_m)}{P_m}$ where TR = unilateral transfers (i.e. remittances); x, m = Exports and imports of goods and services net of income payment to and from the rest of the world; P_x, P_m = export and import prices. The expression $x \frac{(P_x - P_m)}{P_m}$ it is the effect of the terms of trade.²

By including the terms of trade and unilateral transfers, the external balance reflects the productive structure of the economy. This relates directly the productive structure of the economy to aggregate demand. This can also be included by postulating that exports are a function of the income elasticity of exports and this in turn is a function of the productive structure. Also note that focusing on national income rather than GDP allows for the incorporation of the functional distribution of income in the analysis. Thus, the analysis includes

² The effect of the terms of trade can alternatively be expressed as being equal to the volume of exports of goods and services (or exports at constant prices) multiplied by the change in the trade price index:

$$(5) TTE = x(P_x - P_m) \quad P_m = x(P_x P_m - 1)$$

The effect of the terms of trade can be derived from,

$$(6) TTE = X - MP - X_p X - M_p M$$

Where:

X = value of exports of goods and services.

M = value of imports of goods and services.

P = price deflator.

p_x = export price index using a base value equal to 1.

p_m = import price index using a base value equal to 1.

$$(7) TTE = x p_x P - 1 + m 1 - p_m P$$

Where:

$$x = X p_x; m = M p_m$$

Assuming that the price deflator is equal to the price of imports, equation (4) can be simplified as: $P = p_m$

$$(8) TTE = x p_x P_m - 1$$

three interrelated dimensions of productive activity: aggregate demand, the productive structure of the economy and the functional distribution of income.

The specification of sectoral balance sheets can be complemented by equations that relate these flows to stocks, and more precisely to the accumulation of assets and liabilities. That is,

$$(9) BF_{pr} = \Delta D_{pr} + e\Delta D_{pr}^* + \Delta AF_{pr}$$

$$(10) BF_g = \Delta D_g + e\Delta D_g^* + \Delta AF_g$$

$$(11) B = e(\Delta D_{pr}^* + \Delta D_g^*) + e\Delta RI$$

Where Δ = discrete change over time, p.e. $\Delta X_t = X_t - X_{t-1}$, where X_t refers to the stock variable X in period t . D_{pr}, D_{pr}^* = local currency and foreign currency debt stock of the non-financial corporate sector; D_g, D_g^* = the government's debt stock in local currency and foreign currency; e = nominal exchange rate; AF = financial assets; RI = international reserves.

In equation (10) a deficit ($BF_g < 0$) (surplus, ($BF_g > 0$)) of the general government corresponds to an increase (decrease) in domestic and/or external debt ($\Delta D_{pr}, \Delta D_{pr}^*$). The increase in the external debt of the private and/or public sector $\Delta D_{pr}^* + \Delta D_g^*$ and the de-accumulation of international reserves (ΔRI) are the counterparts to the financing imbalance of external sector (B) (equation (11)).³

Based on this macroeconomic framework, as a first approximation, the relationship between the external balance and the general government can be analyzed starting with the assumption that the financial balance of the private sector is equal to zero ($BF_{pr} = 0$). This implies that the accumulation of net assets by the private sector is also equal to 0. Formally,

³ See Taylor (1998).

$$(12) BF_g + B = 0 \Leftrightarrow (G - Y_g) + \left[(x - m) + TR + x \frac{(P_x - P_m)}{P_m} \right] = 0$$

$$\Leftrightarrow (12) (G - Y_g) = - \left[(x - m) + TR + x \frac{(P_x - P_m)}{P_m} \right]$$

The underlying rationale for this assumption is that, particularly in smaller economies, exports, remittances, and terms of trade (i.e., x, TR, p_x, p_m), along with government expenditure (i.e., G), are the truly exogenous variables. The behavior of these economies largely depends on the evolution of these factors. Variations in gross fixed capital formation may respond to the logic of the super multiplier and changes in imports, as investment is largely import-intensive. Changes in exports and government expenditure initiate economic activity by influencing the level of national income. The accumulation of net assets by the private sector is endogenously linked to the evolution of national income.

According to equation (12), a general government surplus (deficit) necessarily implies a surplus (deficit) of the external sector.⁴ Postulating that government income is equal to a proportion of national income (i.e., $Y_g = \alpha Y$, $0 < \alpha < 1$) and imports of goods and services also depend on national income (i.e., $m = \beta Y$, $0 < \beta < 1$),

$$(13) (G - Y_g) = - \left[(x - m) + TR + x \frac{(P_x - P_m)}{P_m} \right] =$$

$$(14) (G - \alpha Y) = - \left[(x - \beta Y) + TR + x \frac{(P_x - P_m)}{P_m} \right]$$

⁴ Note that twin deficits occur only when the external sector is included. In a closed economy, the deficit (surplus) of the government sector necessarily implies the opposite financial position of the private sector (surplus and deficit).

Re-ordering terms yields,

$$(15) (G - \alpha Y) = - \left[-\beta Y + TR + x \left[1 + \frac{(P_x - P_m)}{P_m} \right] \right]$$

$$(16) G + TR + x \left[1 + \frac{(P_x - P_m)}{P_m} \right] = Y(\alpha + \beta)$$

$\Leftrightarrow$

$$(17) Y = \frac{G + TR + x \left[1 + \frac{(P_x - P_m)}{P_m} \right]}{(\alpha + \beta)}$$

Expression (17) can be reordered assuming that national income can be expressed as a weighted sum of the general government and the external sector (exports, unilateral transfers, and the effect of the terms of trade divided by the sum of the government's share of income and the average propensity to import). That is,

$$(18) Y = \theta \left(\frac{G}{\alpha} \right) + (1 - \theta) \left[\frac{TR + x \left[1 + \frac{(P_x - P_m)}{P_m} \right]}{\beta} \right]$$

Where, $\theta = \frac{\alpha}{\beta + \alpha}$

If $Z = TR + x \left[1 + \frac{(P_x - P_m)}{P_m} \right]$ then the expression is reduced to equation (18),

$$(19) Y = \theta \left(\frac{G}{\alpha} \right) + (1 - \theta) \left(\frac{Z}{\beta} \right)$$

Where $\left(\frac{G}{\alpha}\right)$ and $\left(\frac{Z}{\beta}\right)$ are the fiscal stance and the foreign trade performance ratio.

Since by construction income (Y) is a weighted mean of $\left(\frac{G}{\alpha}\right)$ and $\left(\frac{Z}{\beta}\right)$, if $\left(\frac{G}{\alpha}\right) > \left(\frac{Z}{\beta}\right)$, then,

$$(20) \left(\frac{G}{\alpha}\right) > Y > \left(\frac{Z}{\beta}\right)$$

In this case the inequality in equation (20) gives rise to the existence of twin deficits.

$$(21) G > (Y * \alpha) \text{ y } Z < (Y * \beta) \Leftrightarrow G > Y * \left(\frac{Y_g}{Y}\right) \text{ y } Z < Y * \left(\frac{M}{Y}\right)$$

$$\Leftrightarrow G > Y_g \text{ y } Z < M \text{ (government and external deficit).}^5$$

The opposite situation (fiscal and external surplus) occurs when $\left(\frac{G}{\alpha}\right) < \left(\frac{Z}{\beta}\right)$.

According to this framework and its underlying logic, the internally generated revenue stream and the revenue stream derived from external demand cannot be independent of each other. Either domestic demand adjusts to conform to external performance, or vice versa. (Godley and Cripps 1983). As in the balance-of-payments constrained growth approach, domestic conditions ultimately depend on the performance of the external sector.⁶

It should be recalled that the hypothesis behind equation (12), that is

$BF_{pr} = BF_g + B$ or $BF_{pr} = 0 \Leftrightarrow BF_g = -B$ was originally conceived by the members of the New Cambridge School. They indeed argued in the 1970s that in the United Kingdom that the net balance of the private sector was small and tended toward zero (Lavoie 2022, 562).⁷ When

⁵ See Anyadike-Danes (1996).

⁶ See McCombie y Thirlwall (1994; 1999).

⁷ Maloney (2012, 1001), argues that in the 1970s, the Cambridge Economic Policy Group (CEPG) sustained the hypotheses that the net acquisition of assets by the private sector was stable with important implications for demand management and the balance-of-payments. In 1974, Godley and Cripps, set out the fullest public statement of New

analyzing the United States economy during the 1970–97 period, Godley (1995, 12) asserted that NAFA had properties (“as a share of GDP NAFA does not exhibit a trend and that its range of fluctuation is limited”) which led to the “important conclusion that the public sector deficit will normally, and on average, be at least as large as the balance of payments deficit.”

According to this logic, the financial balance of the government (BF_g) will equal the balance of the external sector (B) only if the fiscal stance is exactly equal to the foreign trade performance ratio (Godley and Cripps 1983, 296). This position is a full steady state in which the stock of government debt is constant, and the balance of the external sector is equal to zero. This situation can only happen by “a fluke” (Lavoie 2022, 563); there is nothing within the logic of stock-flow open economy model to make this happen (Godley and Lavoie 2007, 179 and 202).

As a result, either the fiscal stance is smaller than the foreign trade performance ratio, which implies the existence of twin surpluses or the fiscal stance is higher than the foreign trade performance ratio which means the existence of a twin deficit. The latter situation cannot prevail since it entails “ever-increasing government debt relative to income accompanied by continuous external deficits” (Godley and Cripps, 1983, 297). Restoring the equilibrium requires reducing the fiscal stance and/or increasing the foreign trade performance ratio. Godley and Cripps identify two related sets of pressures to bring about the adjustment: the presence and participation of foreign investors in sovereign debt financing and a depreciation of the currency. Godley and Lavoie (2007, 202) argue that, since countries do not have “spare international reserves permanently,” eventually they will have to adjust by contracting fiscal expenditures (an alternative or complementary measure is to increase the tax rate).

In the case of smaller open economies such as that of El Salvador, we observe that the budget deficit (i.e., the government balance) tends to mirror the external deficit (the external balance). This would indicate, in line with the above reasoning, a stable but small net acquisition of assets by the private sector. The characteristics of this type of economy would indicate that the drivers

Cambridge’s ideas which included their contention ‘that other than in the short term the private sector shows a small stable surplus’ implied that ‘the public sector’s budget deficit fully determines the balance of payments’.

of its performance and evolution over time are government expenditures and exports (the main exogenous variables).

Within this context we can assume that the net acquisition of assets by the private sector is endogenous and responds to changes in government expenditures and exports. Hence even though the equality between the fiscal stance and foreign trade performance (a full steady state equilibrium) can occur only by fluke, it can be a good starting point to analyze and understand the dynamics of smaller economy and explain how the two main exogenous variables drive the economic system. In addition, what we observe in smaller developing countries such as in the case of El Salvador is the existence of recurrent twin deficits without there being ever-widening government deficits and balance-of-payments deficits.

5. CALIBRATION

We calibrate equation (18) for the in-sample simulation discussed in Section 4 using quarterly and annual data for El Salvador obtained from the central bank (Banco Central de Reserva de El Salvador).⁸ For the out-of-sample simulations, we adopt a set of assumptions broadly consistent with the macroeconomic framework underpinning the IMF-supported program, as summarized in Table 1. The fiscal balance of the non-financial public sector (SPNF) remains in deficit throughout the projection horizon but follows a gradual consolidation path, improving from –2.1 percent of GDP in 2026 to –1.5 percent by 2030. This trajectory indicates a moderate tightening of fiscal policy, implying a reduced injection of net financial resources into the domestic economy over time. Furthermore, the current account balance (CAB) remains persistently negative but relatively stable, moving from –0.9 percent of GDP in 2026 to –0.7 percent by 2030. The limited variation in the CAB reflects a broadly balanced evolution of exports and imports, combined with relatively stable price dynamics. Moreover, the relatively small size of the deficit is consistent with the continued strength of remittance inflows, which remain above

⁸ All quarterly series were seasonally adjusted using the X-13ARIMA-SEATS procedure developed by the US Census Bureau.

20 percent of GDP throughout the projection period and play a key role in sustaining the external position.

Export prices are projected to grow at -0.4 percent in 2026, before recovering to 0.4 percent in 2027, peaking at 0.8 percent in 2028, and stabilizing at 1.0 and 0.4 percent in 2029 and 2030, respectively. Import prices follow a broadly similar trajectory, though with slightly different timing and magnitude, declining more sharply in 2026 (-1 percent) and then increasing gradually to 0.4 percent in 2027, 0.6 percent in 2028, 0.8 percent in 2029, and 0.4 percent in 2030. These assumptions imply an initial improvement in the terms of trade in 2026, as import prices fall more than export prices, effectively increasing the purchasing power of exports in terms of imports. This temporary gain relaxes the external constraint in the short run, contributing to the relatively contained current account deficit in that year. In 2027, the terms of trade remain broadly stable, as export and import prices grow at the same rate. A mild improvement is again observed in 2028, with export prices increasing slightly faster than import prices (0.8 versus 0.6 percent). However, this trend reverses in 2029, when import prices outpace export prices, generating a modest deterioration in the terms of trade. By 2030, parity between export and import price growth implies a neutral contribution from price dynamics.

It is also possible to determine the path of the net acquisition of financial assets (NAFA), derived from the IMF projections. Under the reported assumptions, NAFA remains positive over the entire horizon, ranging from 1.2 percent of GDP in 2026 to 0.8 percent in 2030, with a peak of 1.3 percent in 2028. This implies that, despite the presence of fiscal deficits, the external inflows—driven primarily by remittances—are sufficient to generate a net lending position for the private sector. However, the gradual decline in NAFA over time reflects the combined effect of fiscal consolidation and the persistence of current account deficits in the medium term.

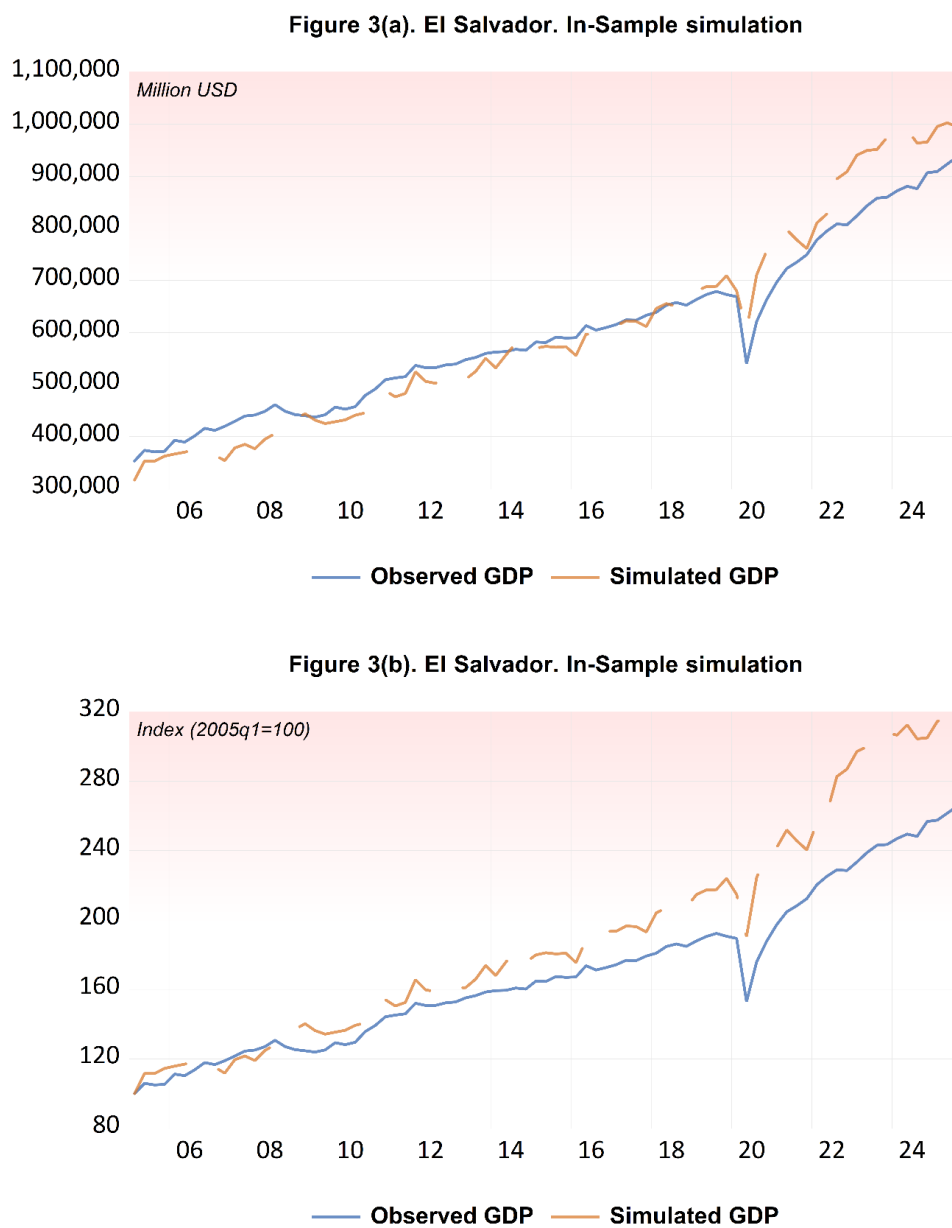
Table 1: IMF Projections Based to Calibrate Out of Sample Simulations

Variable	2026	2027	2028	2029	2030
Nominal GDP Growth (%)	4.7	4.9	5.0	4.6	4.8
Fiscal Balance (% GDP)	-2.1	-1.7	-2.1	-1.8	-1.5
Exports (growth, %)	2	4	5	5	5
Imports (growth, %)	2	3	4	4	3
Export Prices (growth, %)	-0.4	0.4	0.8	1	0.4
Import Prices (growth, %)	-1	0.4	0.6	0.8	0.4
Remittances (% GDP)	22	22	21	21	20
CAB (% GDP)	-0.9	-0.8	-0.8	-0.7	-0.7
NAFA (% GDP)	1.2	1.0	1.3	1.2	0.8

Source: IMF (2025)

6. FINDINGS

Figure 3. In-Sample Simulation



Source: Own elaboration, Banco Central de Reservas

Figure 3 compares the simulated path of nominal GDP with the corresponding observed series, both in levels and indexed to 2005Q1. Overall, the upward trajectory of nominal GDP over the sample period is reproduced reasonably well, capturing the main phases of expansion while displaying smoother dynamics relative to the data. In the initial phase (mid-2000s), the two series evolve closely, with both the level and indexed values showing a gradual and consistent increase. This alignment suggests that we adequately capture the underlying drivers of growth in a relatively stable macroeconomic environment. A first divergence emerges around the period of the global financial crisis, where the observed series exhibits more pronounced fluctuations, including short-lived slowdowns, while the simulated path remains comparatively smooth and does not fully replicate the temporary volatility observed in the data.

Differences become more evident during the COVID-19 period. The observed series shows a marked contraction followed by a rapid rebound, resulting in a visible break in the indexed trajectory. By contrast, the simulated series displays a more gradual adjustment, underestimating both the magnitude of the downturn and the strength of the subsequent recovery. This leads to a temporary widening of the gap between the two series, particularly in the indexed comparison. In the post-pandemic period, both series return to an upward trend. However, the observed GDP grows at a faster pace, leading to a higher cumulative increase relative to the base year. This is reflected in the indexed values, where the observed series reaches levels above three times its 2005Q1 value, while the simulated series remains closer to a doubling. Despite these discrepancies—mainly concentrated around periods of heightened volatility—we are able to capture the key turning points and the overall long-run growth pattern of nominal GDP. The main limitation lies in the smoother adjustment dynamics, which tend to dampen short-term fluctuations and large shocks relative to the observed data. Figure 4 reports the decomposition of nominal GDP into the contributions of the fiscal stance, the external stance, and the residual component capturing the deviation from observed data. Panel (a) presents the shares of each component relative to GDP, while panel (b) reports their respective contributions to GDP growth.

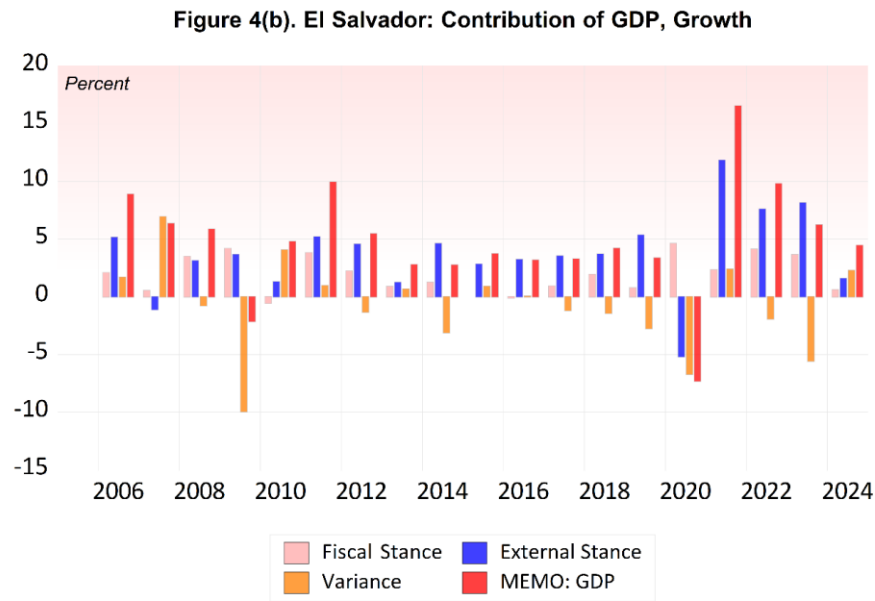
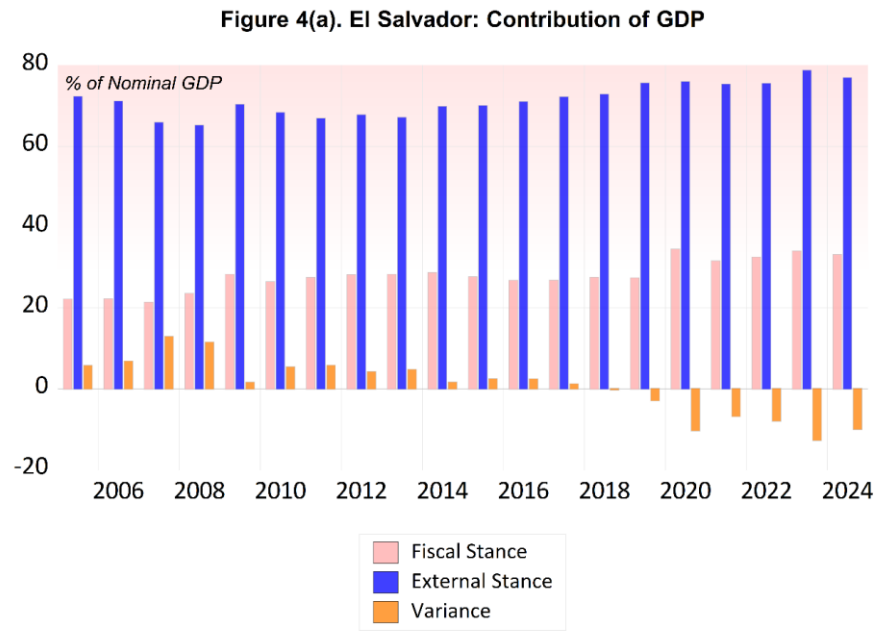
Panel (a) shows that the external stance consistently represents the largest share of GDP throughout the sample, accounting for roughly 65 to 78 percent of total output. The fiscal stance,

by contrast, remains significantly smaller but relatively stable, fluctuating within a range of approximately 22 to 34 percent. The residual component is generally limited in magnitude, although it becomes more volatile during specific periods. In particular, the residual turns negative and increases in absolute value in the later years and around major shocks, indicating a growing discrepancy between simulated and observed GDP. A notable shift occurs in 2020, where the fiscal share rises markedly (above 34 percent), while the residual becomes strongly negative. Panel (b) highlights the contribution of each component to GDP growth. Over most of the sample, growth is predominantly driven by the external sector, which provides the largest and most persistent positive contribution. The fiscal stance also contributes positively in several periods, although its impact is generally more moderate and stable over time. The residual component tends to play a secondary role but becomes particularly relevant during periods of heightened volatility. This is especially evident in 2009 and 2020, where the residual contribution turns strongly negative, offsetting the positive contributions from the fiscal and external components and resulting in an overall contraction in GDP. In the post-2020 period, the external contribution rebounds sharply, driving the recovery in GDP growth, while the fiscal contribution remains positive but comparatively smaller.

The projections⁹ of nominal GDP, reported in Figure 5, are expressed as an index with base year 2024=100 and compared with the alternative benchmark scenario (IMF projections). Both series display a sustained expansion over the projection horizon (2025–30), although with noticeable differences in magnitude and growth dynamics. Starting from the common base in 2024, the projected series reaches approximately 129.8 by 2030, while the benchmark projection attains a higher level of about 133.4. This implies a cumulative gap of roughly 3.5 index points by the end of the period, indicating a more moderate growth relative to the benchmark. In terms of annual growth, the two series follow a similar trajectory in the short run, with growth rates around 5 percent in 2025. However, divergences emerge from 2026 onward. The benchmark projections show a slightly stronger expansion in the early years, while our series exhibits a more uneven profile, with growth decelerating to around 3.3 percent in 2027 before recovering in subsequent years. By contrast, the benchmark maintains a relatively smoother pattern, with growth rates fluctuating within a narrower range.

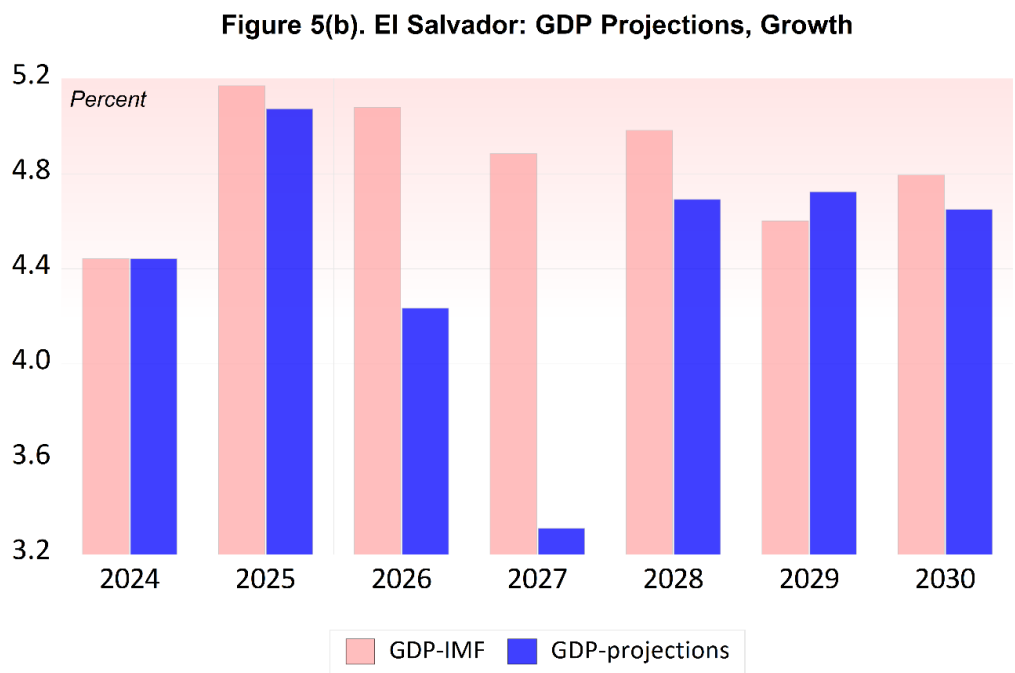
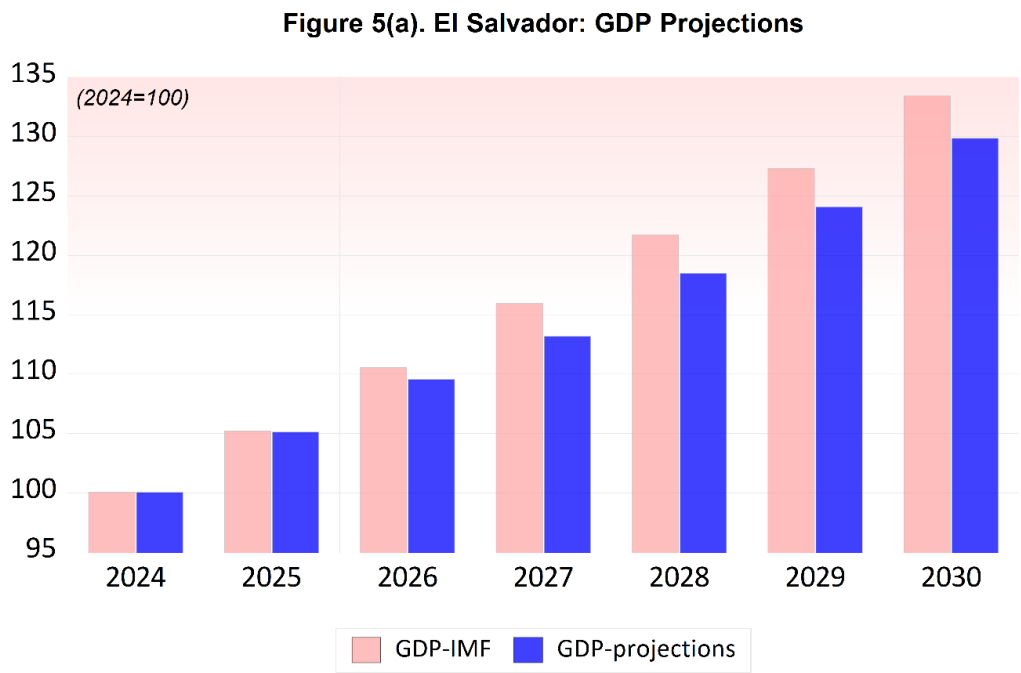
⁹ The residuals from the in sample simulation were assumed to converge to 0 for out of sample projections.

Figure 4. Decomposition of In-Sample Simulation



Source: Own elaboration, Banco Central de Reservas

Figure 5. Out-of-Sample Simulation



Source: Own elaboration, IMF (2025)

We also examine the dynamic relationship between the fiscal stance (FSTANCE) and the external stance (EXSTANCE) in El Salvador using Granger causality tests. Given that both variables are found to be integrated of order one, $I(1)$, over the full sample (2005Q1–2025Q3) and the two sub-samples (2005Q1–2019Q4 and 2020Q1–2025Q3), we employ the Toda and Yamamoto (1995) procedure. This approach allows testing for Granger causality in a level VAR augmented by the maximum order of integration, thereby avoiding potential biases associated with pre-testing for cointegration. Lag length selection is based on standard information criteria. The Akaike Information Criterion (AIC) suggests a lag structure of five for the full sample, three for the pre-COVID sub-sample, and one for the post-COVID period. By contrast, both the Schwarz (SC) and Hannan–Quinn (HQ) criteria consistently select a more parsimonious lag of one across all samples. To ensure robustness, results are reported for both specifications.

Table 2 summarizes the results of the Wald tests for block exogeneity. For the full sample (2005Q1–2025Q3), the null hypothesis of no causality is rejected in both directions under all lag specifications. In particular, fiscal stance Granger-causes the external balance ($\chi^2 = 22.20$, $p < 0.01$ under AIC; $\chi^2 = 9.06$, $p < 0.01$ under SC/HQ), while the external stance also Granger-causes the fiscal balance ($\chi^2 = 20.31$, $p < 0.01$ under AIC; $\chi^2 = 12.26$, $p < 0.01$ under SC/HQ). This provides strong evidence of bidirectional causality between the two balances over the long period. For the pre-COVID sub-sample (2005Q1–2019Q4), the results are less robust. Under the SC/HQ specification (lag 1), the null of no causality cannot be rejected in either direction. However, when adopting the AIC-preferred lag structure (lag 3), there is evidence of unidirectional causality running from the fiscal stance to the external stance ($\chi^2 = 9.98$, $p < 0.05$), while the reverse relationship remains statistically insignificant. This suggests that, prior to 2020, fiscal dynamics may have influenced the external balance, although the relationship appears sensitive to model specification.

A different pattern emerges in the post-COVID period (2020Q1–2025Q3). Here, the results indicate unidirectional causality from the external stance to the fiscal stance ($\chi^2 = 5.26$, $p < 0.05$), with no evidence supporting the reverse direction. This finding points to a shift in the underlying adjustment mechanism, whereby external conditions increasingly shape fiscal outcomes. These results suggest that the relationship between fiscal and external balances in El Salvador is not

stable over time but instead varies across macroeconomic regimes. The bidirectional causality observed in the full sample appears to mask important structural differences between the pre- and post-COVID periods. Before 2020, the evidence—albeit not fully robust—leans toward a fiscal-driven external adjustment. In contrast, in the more recent period, the direction of causality reverses, indicating that fiscal dynamics have become more responsive to the external balance. These findings are consistent with the sectoral balances approach, whereby the fiscal and external positions are jointly determined within a macroeconomic accounting framework. In particular, they resonate with the evidence presented in Nikiforos et al. (2015), which emphasizes that fiscal and external imbalances cannot be analyzed in isolation, as adjustments in one sector necessarily have implications for the others. In this context, the shift toward external-led causality in the post-2020 period may reflect a tightening of external constraints, with important implications for the conduct of fiscal policy in a dollarized economy.

Table 2: Granger Causality Test

Sample period	Lag (criterion)	FSTANCE → EXSTANCE	EXSTANCE → FSTANCE	Direction of causality
2005Q1–2025Q3	5 (AIC)	$\chi^2 = 22.20$ (0.0005) ***	$\chi^2 = 20.31$ (0.0011) ***	Bidirectional
2005Q1–2025Q3	1 (SC/HQ)	$\chi^2 = 9.06$ (0.0026) ***	$\chi^2 = 12.26$ (0.0005) ***	Bidirectional
2005Q1–2019Q4	1 (SC/HQ)	$\chi^2 = 0.01$ (0.903)	$\chi^2 = 1.02$ (0.313)	No causality
2005Q1–2019Q4	3 (AIC)	$\chi^2 = 9.98$ (0.019) **	$\chi^2 = 1.44$ (0.695)	FSTANCE → EXSTANCE
2020Q1–2025Q3	1 (all criteria)	$\chi^2 = 1.97$ (0.160)	$\chi^2 = 5.26$ (0.022) **	EXSTANCE → FSTANCE

Source: own elaboration. Note: P-values in parentheses *** p < 0.01; ** p < 0.05. Toda–Yamamoto procedure with variables integrated of order I(1)

7. CONCLUSIONS

This paper has examined the interaction between fiscal sustainability and the external sector in El Salvador through the construction of a stock-flow consistent accounting framework tailored to the institutional and structural characteristics of a smaller and dollarized economy including the persistent coexistence of twin deficits. By integrating the financial positions of the government, the private sector, and the rest of the world within a unified sectoral balances approach, the analysis has shown that public debt dynamics cannot be understood independently of the country's persistent external imbalances and its reliance on external financing. This is shown through the interaction between the fiscal stance and the foreign trade performance ratio.

The results suggest that, under dollarization, the absence of exchange rate flexibility significantly constrains the adjustment process, making fiscal and external balances jointly determined rather than independent policy objectives. More broadly, the exercise illustrates the usefulness of the stock-flow consistent approach for analyzing economies where financial stocks, external transactions, and fiscal positions are closely intertwined. Rather than focusing exclusively on government debt, the framework highlights the importance of considering the interaction between domestic demand, trade performance, remittance inflows, and external financing in shaping long-run macroeconomic outcomes. In this sense, the analysis suggests that policies aimed solely at fiscal consolidation may prove insufficient unless they are accompanied by measures capable of strengthening productive capacity and improving the external position of the economy.

At the same time, the present exercise should be interpreted with due caution. Although the framework relies on observed historical data and official macroeconomic projections from the IMF (2025) for its out-of-sample simulations, it should not be regarded as a fully specified stock-flow consistent model in the tradition of the New Cambridge approach and later works (Godley 1999; Nikifors and Zezza 2017). Unlike the empirical SFC models developed in that tradition, the present framework does not estimate behavioral equations governing key macroeconomic relationships such as consumption, investment, imports, or portfolio allocation. Instead, the accounting structure is closed using exogenous projections for the principal driving variables,

allowing the analysis to maintain stock-flow consistency while focusing on the implications of alternative fiscal and external trajectories. These limitations naturally point towards several avenues for future research. A fully articulated behavioral SFC model calibrated to the Salvadoran economy would permit the endogenous determination of macroeconomic adjustments and provide a richer assessment of the interactions between fiscal policy, external balances, financial stocks, and economic growth. Such a model would also make it possible to evaluate a broader range of policy scenarios than those considered in the IMF program, offering alternative projections under different assumptions regarding fiscal policy, remittance dynamics, external demand, and international financial conditions.

Finally, extending the present accounting framework into a behavioral SFC model could help explain some of the empirical regularities identified in this paper. In particular, the Granger causality analysis suggests the existence of a possible regime shift in the relationship between the fiscal stance and the external balance, indicating that the direction of causality may vary across different phases of the adjustment process. Exploring the mechanisms underlying this result—together with the role of dollarization in amplifying or constraining macroeconomic adjustment—constitutes a promising direction for future research. More generally, the development of a complete behavioral model would provide a valuable tool for assessing the long-run sustainability of fiscal and external positions in El Salvador and other dollarized developing economies facing similar structural constraints.

REFERENCES

- Alvarado, C. A., and Melgar, O. C. 2013. “Evolución del déficit fiscal y la deuda pública en El Salvador.” Banco Central de Reserva de El Salvador.
- Álvarez, A. 2024. “Dolarización, crisis fiscal y estancamiento: el caso de El Salvador,” in R. A. Hernández Calderón (Coord.), *Sostenibilidad fiscal y evolución de la deuda pública en El Salvador*, 437-510. UCA Editores.
- Álvarez, A., & Barrera, S. 2018. “Socializar los costos: Las reformas del sistema de pensiones y sus implicaciones en la deuda pública en El Salvador, 1996–2017.” CLACSO Working Paper.
- Álvarez, A., Arévalo, J., Argueta, C., and Vides, A. 2017. “Vínculos causales entre crecimiento económico, deuda pública y gasto gubernamental en El Salvador,” in *Compendio de documentos de investigación ganadores II Congreso Internacional de Pensamiento Económico Latinoamericano*, 101–52. Banco Central de Bolivia.
- Argueta, C. E., & Hernández, R. A. 2024. “Los vínculos estructurales entre la deuda pública previsional y el crecimiento económico en El Salvador,” in R. A. Hernández Calderón (Coord.), *Sostenibilidad fiscal y evolución de la deuda pública en El Salvador*, 387-436). UCA Editores.
- Baltodano, O. 2017. “Alternative closures for an open economy model in a stock and flow consistent framework: the case of Central America.” Documentos de Trabajo, (061). Banco Central de Nicaragua.
- Banco Central de Reserva (BCR). 2026. Oferta de estadísticas macroeconómicas (Dataset). Retrieved April 29, 2026, from <https://estadisticas.bcr.gob.sv/oferta-estadistica>
- Barrientos, R. 2015. “El Salvador: Una política fiscal diseñada como base y garantía para un sistema económico rentista y expoliador,” in *Instituto Centroamericano de Estudios Fiscales (ICEFI)* (Ed.), *Política fiscal: Expresión del poder de las élites centroamericanas*. F&G Editores.
- Cabrera, O. 2022. “Factores condicionantes del crecimiento del PIB, la inversión, la productividad laboral y sus impactos en la estructura socioeconómica salvadoreña desde una perspectiva histórico-estructuralista,” in *Patrones de desarrollo económico en los seis países de Centroamérica (1950–2018)*, edited by R. Bielschowsky, M. C. Castro, & H. E. Beteta, 87–128. Economic Commission for Latin America and the Caribbean (ECLAC).
- Fernández, J. 2017. “Elementos de análisis para la sostenibilidad de una economía dolarizada.” *Revista Economía* 69(109): 189–212.

- Glower, C. J. 2013. “Aspectos monetarios de la dolarización y la reactivación económica en El Salvador: Diagnóstico, perspectivas y opciones.” Centro Nacional de Investigaciones en Ciencias Sociales y Humanidades.
- Góchez, R. 2011. “Atraso, liberalización y dolarización.” *ECA: Estudios Centroamericanos* 66(726): 331–354. <https://doi.org/10.51378/eca.v66i726.3409>
- Godley, W. and Cripps, F. 1983. *Macroeconomics*. New York: Oxford University Press
- Godley, W. and Lavoie, M. 2007. *Monetary Economics*. New York: Palgrave Macmillan
- Godley, W. 1995. “U.S. Foreign Trade, the Budget Deficit, and Strategic Policy Problems: A Background Brief.” Working Paper, No. 138. Levy Economics Institute of Bard College, Annandale-on-Hudson, NY.
- Godley, W. A. H. and Cripps, F. 1974. “Why Britain needs a fresh set of principles to manage the economy.” *The New York Times*, January 22, 1974.
- Hinds, M. 1999. *Consideraciones sobre la dolarización en El Salvador*. Banco Central de Reserva.
- Hinds, M. 2006. *Playing Monopoly with the Devil: Dollarization and Domestic Currencies in Developing Countries*. Yale University Press.
- International Monetary Fund (IMF). 2025. El Salvador: Request for extended arrangement under the Extended Fund Facility—Press release; staff report; staff statement; and statement by the Executive Director for El Salvador (IMF Country Report No. 25/58). International Monetary Fund. <https://doi.org/10.5089/9798229003483.002>
- Izurieta, A. 2002. “Dollarization: a dead end.” Levy Economics Institute Working Paper No. 344.
- Izurieta, A. 2003. “Dollarization as a tight rein on the fiscal stance,” in *Dollarization*. Routledge.
- Lavoie, M. 2022. *Post-Keynesian Economics: New Foundations*. Cheltenham, UK and Northampton, MA, USA: Edward Elgar.
- Maloney, J. 2012. “The Treasury and the New Cambridge School in the 1970s.” *Cambridge Journal of Economics* 36: 995–1017.
- Missaglia, M. 2021. “Understanding dollarisation: A keynesian/kaleckian perspective.” *Review of Political Economy*, 33(4): 656–86.
- Montesino, M. S. y López, J. J. 2024a. Capítulo V: Impacto de la deuda pública en el crecimiento. In R. A. Hernández Calderón (Coord.), *Sostenibilidad fiscal y evolución de la deuda pública en El Salvador*: 195–272. UCA Editores.

- Moreno-Brid, J. C., Morales-López, R., and Pérez-Medina, E. F. 2025. “Two decades of dollarization in El Salvador: Pains and gains in a road less traveled,” in *Central Banking, Monetary Policy and the Political Economy of Dollarization*, edited by S. A. Kappes and A. Arauz, 165–181. Edward Elgar Publishing.
<https://doi.org/10.4337/9781803925332.00014>
- Nalin, L., Pérez Caldentey, E., Rojas Rodríguez, L., and Yajima, G. 2024. *A stock-flow ecological model for Central America*. Revista CEPAL.
- Nikiforos, M., and Zezza, G. 2017. “Stock-flow consistent macroeconomic models: A survey.” *Journal of Economic Surveys* 31(5): 1204-1239.
- Nikiforos, M., Carvalho, L., and Schoder, C. 2015. “Twin deficits” in Greece: in search of causality.” *Journal of Post Keynesian Economics* 38(2): 302-330.
- Ocampo, J. A., Rada, C., and Taylor, L. 2009. *Growth and policy in developing countries: A structuralist approach*. New York: Columbia University Press.
<https://doi.org/10.7312/ocam15014>
- Perez Caldentey, E. 2009. “Balance of payments constrained growth within a consistent stock-flow framework: an application to the economies of CARICOM.” Naciones Unidas Comisión Económica para América Latina y el Caribe (CEPAL).
- Pleites, W. 2022. “La economía salvadoreña después de la independencia: Por qué estamos como estamos.” Ministerio de Educación.
- Sarsoza, G. Y. L., and Pallasco, F. O. R. 2026. “Rethinking monetary policy: The role of cash preference and endogenous money theories in dollarized countries and with their own currency.” *TRIMESTRE ECONOMICO* 93(369): 111-143.
- Segovia, A. 2021. *El gran fracaso: 150 años de capitalismo ineficiente, concentrador y excluyente en Centroamérica*. F&G Editores.
- Zezza, G., and Zezza, F. 2019. “On the Design of Empirical Stock-Flow-Consistent Models.” Levy Economics Institute Working Paper No. 919.