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Debt dynamics and fiscal policy stance in Cape Verde: Is there evidence of pro-cyclical behavior?

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Abstract

Over the past two decades, Cape Verde has evolved positively in regards to main macroeconomic indicators. But, in contrast with that observed in Sub-Saharan Africa, public debt increased sharply in the aftermath of the 2008-09 crisis, which may constrain growth and development.

In order to assess if recent debt records result from pro-cyclical fiscal policy, we make an exhaustive analysis of debt dynamics in Cape Verde: i) we provide detailed records on debt dynamics and its composition and ii) through estimating cyclical elasticities of the budget balance, we compute structural primary deficits to identify the discretionary fiscal policy stance.

We conclude that recent debt increase was mainly determined by primary structural deficits. However, discretionary policy was adequately counter cyclical or, when pro-cyclical, it was associated with investment efforts. Thus debt correction will be an easy task to perform because debt bias does not mimic deficit bias due to political-cycle motivations.

JEL Codes: E62, H30, H62, H63

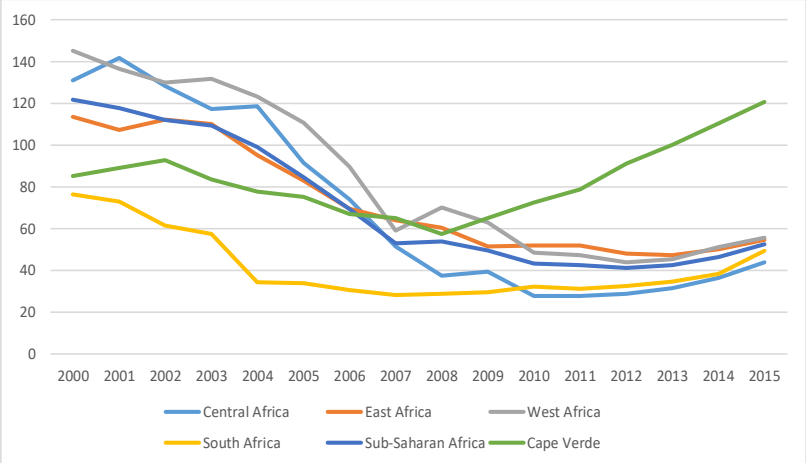
Keywords: Public debt dynamics; Snowball effect; Pro-cyclical fiscal policy; Cape Verde

1. Introduction

Since the Foreign Exchange Cooperation Agreement[1], signed in 1998 between Cape Verde and Portugal, the Cape Verdean economy has evolved positively in regards to main macroeconomic indicators (*e.g.*, Loureiro *et al.*, 2010). However, the public debt to GDP ratio has been consistently worsening, and reached, in 2016, the highest level of 129.3% of GDP (Banco de Cabo Verde-BCV, 2017).

Figures 1 and 2 show a clear decreasing path of debt-to-GDP ratios in Sub-Saharan Africa (SSA), as around 65% of the countries experienced debt relief under the Heavily Indebted Poor Countries (HIPC) initiative (IMF, 2019). Most of the countries, covering almost every country of West and Central Africa, reached the completion point for irrevocable reduction in debt before 2010 and debt ratios reduced, on average, more than two thirds (Merotto *et al.*, 2015). Debt decreasing path was more sharp among Central and West African countries, that exhibited the highest average debt-to-GDP ratios in 2000; in turn, slight improvements were observed in the South Africa region and among countries placed in the 1st and 2nd quartiles. Cape Verde belongs to West Africa region and is placed in the 3rd quartile; while these countries are, on average, among the second best performers, Cape Verde, a non-HIPC but still with similar debt ratio close to SSA average in 2008, exhibits a clear inverse trend from then onwards.

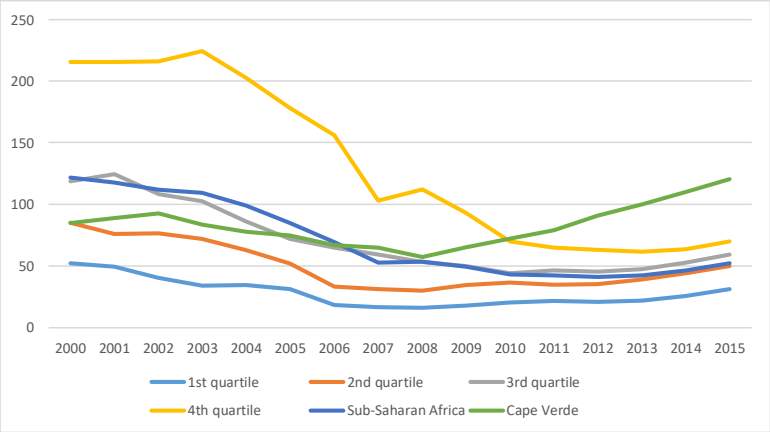
Figure 1: Public debt in Sub-Saharan Africa (% of GDP) per region, 2000-2015



Source: author's calculations based on IMF's Historical Public Debt Database at https://www.imf.org/external/datamapper/DEBT1@DEBT/OEMDC/ADVEC/WEOWORLD, accessed in August, 2020. Note: no data for Somalia.

[1] This arrangement agrees on a fixed parity between the Portuguese currency (later, the Euro) and the Cape Verdean Escudo.

Figure 2: Public debt in Sub-Saharan Africa (% of GDP) per quartile, 2000-2015



Source: *idem*.

Given specific structural features of Cape Verde, unfavorable public debt dynamics may represent an important constraint to growth and development. First, with little agricultural endowments, due to its climate characteristics, and without being self-sufficient in terms of industrial products, Cape Verde is strongly dependent from the rest of the world (*e.g.*, Loureiro *et al.*, 2010). Given this chronic external dependence, it is therefore extremely important to promote balanced budgets as to control external savings. On the one hand, since the external public debt amounts to over 90% of GDP (see, *e.g.*, BCV, 2017), fiscal discipline is important to avoid exchange rate pressures and outflows of foreign reserves that can put at stake the exchange rate regime. On the other hand, sound public finances signal financial health to international partners. Second, higher debt levels limit, through increased debt service, the fiscal space, crucial to promote macroeconomic stabilization. Cape Verde is prone to shocks due, *e.g.*, to adverse climate conditions, but the choice of a fixed exchange rate regime, together with low (and the recent abolishment of) capital controls[2], prevent the use of monetary policy for stabilization purposes. Finally, being an archipelago with ten islands, several infrastructures have to be replicated with low externality gains and large fixed costs, heavily relying on public investment.

It is important to address if the Cape Verdean debt increasing path results from pro-cyclical expansionary policies (e.g., fed by political motives) or if, instead, it results from an adequate counter-cyclical behavior or, even if pro-cyclical, it reflects public investment effort. Although the assessment of fiscal policy in SSA countries is widely covered in the literature (*e.g.*, Thornton, 2008; Arizala *et al.*, 2021), a study on Cape Verde is absent. In this context,

[2] BCV (2018, p. 101).

our contribution is threefold: i) through estimating cyclical elasticities, we compute the structural primary deficit to identify fiscal policy stance in Cape Verde and ii) its contributions to debt dynamics - an analysis that is still absent from the literature, including technical reports (*e.g.*, BCV, Ministry of Finance); and, iii) the analysis of fiscal policy stance supports policy recommendations for the (imminent) debt correction effort.

We conclude that, given the small cyclical component, recent debt increase was mainly determined by primary structural deficits, adequately counter cyclical or, when pro-cyclical, associated with investment efforts. Thus debt correction may be an easy task to perform because debt bias does not arise from political-cycle motivations.

The paper is organized as follows. Sections 1 and 2 review the costs of large debts and the case for deficit bias in developing countries, respectively, also summarizing empirical evidence for Africa. Section 3 presents the methodology to compute structural primary budgets, and describes data. Section 4 presents the analysis of results and section 5 concludes.

2. Determinants and costs of public debt

By definition, debt dynamics is determined by cumulative budget deficits, including stock-flow adjustments (*e.g.*, Escolano, 2010):

$$\Delta d_t = \lambda_t d_{t-1} - b_t \pm sfa_t, \quad \lambda_t = \frac{r_t - g_t}{1+g_t} \tag{1}$$

Changes in debt-to-GDP ratio at the end of period *t* (Δd_t) result from: "snowball" effect, $\lambda_t d_{t-1}$, current primary deficits-to-GDP (-b_t), and stock-flow adjustments in percentage of GDP, sfa_t. *Sfa* may include several items, namely net acquisition of financial assets, debt adjustment effects and statistical discrepancies.[3] The "snowball" effect results from the difference between the average effective nominal interest rate on debt, r_t, and the nominal output growth rate, g_t. Excluding sfa_t, public debt is on a stable path if $r_t - g_t \leq 0$, while if it is on an explosive, steadily rising path ($r_t > g_t$), primary surpluses are needed to stabilize debt-to-GDP ($\Delta d_t = 0$) at level d_t:

$$b_t = \lambda_t d_t \pm sfa_t \tag{2}$$

Historically, debt reductions resulted mostly from important "snowball" effects and also from primary budget surpluses, while increases in debt ratios are more difficult to explain as

[3] See, *e.g.*, https://ec.europa.eu/eurostat/documents/1015035/10710640/SFA-PR-2020-Apr.pdf/8ca06461-ea44-8cf4-93e2-49f59f5c7b01

they usually involve large stock-flow adjustments that cover different factors of extraordinary nature (*e.g.*, Abbas *et al.*, 2011, European Commission, 2012).

Under low or absent Ricardian effects, public deficits imply crowding-out effects on output, due to pressures in interest rates and consequent private investment and external balance depletion (see, *e.g.*, Buiter & Kletzer, 1992). Even when resulting from counter-cyclical policies, debt accumulation puts pressure on future generations as a smaller capital stock limits potential output, leading to slower economic growth (Modigliani, 1961). Abbas *et al.* (2011), in an historical overview on the debt dynamics for 178 countries between 1880 and 2009, find evidence of a negative relation between debt and economic growth in developed, emerging and developing economies. Baldacci & Kumar (2010) find a positive relation between debt levels and long-run interest rates for developed and emerging countries, 1980-2008, but the relative impact depends on public finance, institutional, and financial markets spillovers initial conditions.

Other studies conclude for a non-linear relation between debt and economic growth: *e.g*, Checherita-Westphal & Rother (2012) and Baum *et al.* (2013) conclude, for 12 countries of the Euro Area, that negative impacts of debt on output growth occur only if debt-to-GDP ratio is above 90-100%; in turn, for debt levels below 70%, debt increases impact positively on growth, even when resulting from non-investment expenditures.

The higher the debt level is, the higher is the risk of default that spreads in a systemic way to the balances of the financial sector. Such risk is amplified by limited access to market financing by an over-indebted government and, in the absence of an independent central bank, base money may be used for debt financing, creating inflation and inflation-tax (*e.g.*, Kannan & Singh, 2007).

Debt dynamics in Africa

From late 1990s to 2010, 65% of SSA countries were under the HICP initiative to receive full and irrevocable reduction in debt conditioned on good performance under the programs supported by the IMF and the World Bank: implementation of key reforms and poverty reduction strategies.[4] This contributed to strongly reduce average public debt and the number of countries with high debt distress in Africa but, by 2013, the number of countries with moderate debt distress was higher than before the inception of the program and eight countries already exhibited a rapid debt built-up (Merotto *et al.*, 2015).

[4] https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/16/11/Debt-Relief-Under-the-Heavily-Indebted-Poor-Countries-Initiative

Ncube & Brixiová (2015) show that, between 2008 and 2012, and unlike the rest of the world, average public debt in Africa decreased to 41% of GDP, a figure well below the 73% recorded, on average, in advanced economies. This debt reduction had a strong contribution from primary budget balances and, in 2015, Africa exhibited the lowest average public debt-to-GDP ratio in recent decades.

Despite this effort, on average, many African economies, including Cape Verde, recorded budget deficits and an increase in debt. IMF (2018a) stresses concerns about the sustainability of public accounts in the region: the recovery of the global economy together with interesting growth rates recorded in some African economies and the recovery of raw material prices in the international markets, improved the access to international financing (with spreads decreasing between 2015 and 2017), even for countries with high debt ratios. Since 2015, average public debt-to-GDP ratio in SSA rose above 50% and 6 countries (Chad, Eritrea, Mozambique, Republic of Congo, South Sudan and Zimbabwe) have been declared over-indebted in 2017. Public debt in small open economies, like Cape Verde, increased, on average, from 50%, before the 2008-09 crisis, to 60% in 2019 (Alichi *et al.*, 2019) and the negative interest rate-growth differential was overcome by primary budget deficits (Ncube & Brixiová, 2015).

3. Fiscal policy stance

Among other, fiscal policy is targeted to stabilize the economy, smoothing economic cycles through two main components: (i) the discretionary component, which represents a set of actions carried out deliberately by the policy authority; (ii) the non-discretionary component, endogenous to fiscal instruments, arises, *e.g.*, from the automatic feedback of budget balance to the cycle, or from interest payments related with the accumulation of liabilities in the past.

Since large (and unsustainable) debts impose costs to the economies, it is crucial to assess if debt increases are not a result from discretionary policy misconduct.

3.1 Primary budget and automatic stabilizers

Automatic stabilizers are the components of the public budget that automatically respond to economic fluctuations, in the absence of direct action by the authorities, such as tax revenues or unemployment benefits (*e.g.*, ECB, 2002).

Compared to discretionary policies, automatic stabilizers react automatically to business cycle fluctuations, providing a timely and, necessarily, counter cyclical response. Besides,

automatic stabilizers "work alone", relying on discretionary policy only as a complement to their action. By deteriorating the budget balance during recessions while improving it during expansions, automatic stabilizers also prevent deficit bias and the accumulation of public debt. According to Swanepoel & Schoeman (2003), unemployment benefits are the most efficient, although, as a rule, automatic stabilizers are stronger on the revenue side.

Recalling (1), the larger the cyclical component and the more counter-cyclical the discretionary component are, the less permanent will be the impacts of the primary budget on public debt and, therefore, the lower will be the risk of incurring in explosive public debt.

3.2 Structural budget balance

The automatic and, therefore, non-deliberate nature of stabilizers, rule out primary budget balance as the best measure for assessing the "stance" of fiscal policy. In turn, the primary cyclically-adjusted budget balance is considered to be a more appropriate indicator to measure discretionary actions (*e.g.*, Hagemann, 1999, and ECB, 2002).

Normative use of fiscal policy for stabilization purposes, in the event of a recession, recommends the primary structural budget balance to decrease, for example, by lowering tax rates or increasing transfers to stimulate the economy, and vice versa. Moreover, taking advantage of positive cycle phases to improve the fiscal position enables that, in face of negative phases, the budgetary space can be used to stimulate the economy without jeopardizing debt sustainability.

However, being discretionary, policy can also be used deliberately in a pro-cyclical manner. For instance, according to ECB (2018), in the expansionary years before the 2008-09 crisis, the Eurozone accumulated successive structural primary deficits, preventing the creation of large enough buffers to deal with the crisis. During the crisis, measures were taken to stimulate the economy, and public debt increased almost 20% of GDP, on average, between 2008 and 2010. Several countries in the Eurozone experienced refinancing difficulties and, ultimately, resorted to international financial assistance under conditional adjustment programs which required the adoption of pro-cyclical, contractionary, fiscal policies during a recession.

Finally, and as a side-effect, Davig & Leeper (2011) argue that keeping successive primary deficits also compromises the effectiveness of monetary policy: forward-looking agents will be able to anticipate that, in the future, monetary policy will have to be used to address the debt problem at the expenses of inflation control.

3.3 Determinants of pro-cyclical behavior

Most of the existing evidence confirms a pro-cyclical bias, not only, but mainly, in developing countries (*e.g.*, Talvi & Vegh, 2005, Alesina *et al.*, 2008 and Ilzetzki & Vegh, 2008), due to political economy and credit imperfections channels.

Alesina *et al.* (2008) argue that pro-cyclical fiscal policies arise from political-agency problems. Under imperfect information, voters observe the state of the economy, but fail to have complete information about policy execution by potential corrupt governments. When the economy is expanding, voters demand tax cuts or higher government expenditures, forcing the authority to accumulate excessive debt. Evidence points to a strong correlation between corruption and pro-cyclicality of fiscal policy. In the same vein, Wyplosz (2008) refers to the problem of the common pool: interest groups within society demand for transfers and public consumption to increase their utility, once there is a common pool for the tax base. In spite negative externalities, governments are often captured by interest groups and end up running deficits.

According to Rogoff & Sibert (1988), manipulation of policy variables also derives from information asymmetries. Since the government is able to observe its performance before the representative agent, it has incentives to signal its competence to voters prior to elections, leading to the exploitation of the electoral cycle by a low-competence government.

Alesina & Tabellini (1990) argue that, by accumulating large amounts of debt, the government in power limits the ability of successors to incur in expenditures that do not benefit its constituents and, at the same time, paves the way for a future reelection.

Finally, another political economy-related channel is the degree of social polarization (measured, *e.g.*, by the level of inequality in income). Woo (2009) states that high levels of preference polarization of the constituency can make it difficult for the government to harmonize policy targets given heterogeneous socioeconomic groups. The author shows that social polarization is positively associated with pro-cyclicality.

Another determinant of the pro-cyclical bias in fiscal policy in developing countries is the pro-cyclical access to finance. Carmignani (2010) claims that developing economies have difficult access to credit during recessions, thus they cannot incur in successive deficits, cutting expenditures, necessarily. Frankel (2013) argues that the pro-cyclicality of capital flows is due to imperfections in capital markets, such as the existence of asymmetric information and the requirement for collaterals, and this makes, in turn, governments unable to resist the political pressure to increase spending during expansions.

3.4 Pro-cyclical bias in Africa? A literature overview

Carmignani (2010), relying on a sample of 37 SSA countries, 1960-2007, concludes that, in general, African countries are characterized by pro-cyclical fiscal policy (for some, such as Cape Verde, policy is acyclical). Using similar samples, Thornton (2008), Lledó *et al.* (2011) and Calderón *et al.* (2017) conclude that government consumption tends to be more pro-cyclical in SSA than in developing countries in other regions, often reacting more than proportional to output fluctuations. Calderón *et al.* (2017) also conclude that in SSA there is a procyclical bias in expansions, while fiscal policy tends to be acyclical in recessions. Over the last decade, though, there was a downward trend in pro-cyclicality because, due to better institutional quality, lower levels of public debt created more fiscal space.

While Thornton (2008), Calderón *et al.* (2017) and Jalles (2020) find evidence for countries that are more dependent on foreign aid to have more episodes of pro-cyclicality, Lledó *et al.* (2011) conclude the opposite. The latter add that SSA countries are, in general, more prone to pro-cyclical policies due to region-specific factors, such as weak robustness of automatic stabilizers, as mentioned by Ben Slimane & Tahar (2010), and the fragility to mobilize revenues.

There is also mixed evidence regarding heterogeneous constituencies: Thornton (2008) finds that countries with high income inequality and more democratic have less pro-cyclical public consumption, whereas Jalles (2020), using data for a panel of 46 African economies between 1960 and 2014, finds that more developed African economies, with lower social fragmentation, tend to have a smaller degree of pro-cyclicality.

Jalles (2020) results also confirm those of Calderón & Nguyen (2016) who find that pro-cyclical government expenditure is more likely to occur among non-resource abundant countries as well as in fragile and conflicting states; however, on average, results show that SSA countries were able to implement countercyclical policy responses since 2003, due to better institutional quality. Jalles (2020) reinforces that countries facing constraints on the executive and small regime durability, tend to exhibit lower pro-cyclicality. For a panel of 44 SSA countries over the period of 1980–2008, Mpatswe *et al.* (2011) also find that fiscal policies are pro-cyclical and that institutional weaknesses and poor governance partly explain this behavior. They further find that government consumption is less pro-cyclical than public investment in CEMAC countries. Ben Slimane & Tahar (2010) also conclude that cyclical finance conditions faced by developing countries are a determinant of pro-cyclicality of fiscal policy in Middle East and North Africa (MENA) countries.

Using a sample of 40 African countries over the period 1995–2015, Ouedraogo & Sourouema (2018) provide strong empirical evidence that export concentration is positively associated with pro-cyclical fiscal policy, especially driven by public investment.

As a panacea, the results from Konuki & Villafuerte (2016) suggest that deep domestic financial markets and ample international reserves coverage help countries in Africa to run less pro-cyclical fiscal policies, in particular during downturns. Although failing to find a statistically significant role for institutional strength in reducing the pro-cyclicality of fiscal policy, their case studies and existing literature suggest that fiscal institutions, such as fiscal rules and stabilization funds, are crucial to ensure counter-cyclical policies. Indeed, results in Diallo (2009), using data from 1989 to 2002 for 47 African countries, show that more democratic countries and the introduction of effective restraints on the executive branch increase the likelihood of adopting counter-cyclical fiscal policies. Bova *et al.* (2014) argue though, that in contrast with advanced economies, the adoption of fiscal rules in developing economies has not been associated with more acyclical or counter-cyclical fiscal policies. The failure results from an inadequate design of rules (*e.g.*, cyclically-adjusted targets and escape clauses are relatively uncommon), and more flexible rules require better institutions regarding monitoring and enforcement mechanisms.

4. Public debt dynamics in Cape Verde: methodology and data

In order to assess fiscal policy stance and its consequences on the recent public debt dynamics in Cape Verde, this section provides details on data and methodological approach.

4.1 Fiscal policy stance: definition and methodology for assessing discretionary policy behavior

The assessment on if there is a misconduct of fiscal policy, namely pro-cyclicality, requires some adjustments: public debt service increases expenditures but is not a consequence of current, discretionary behavior; a recession increases expenditures and decreases revenues, through automatic stabilizers; and, abnormal increases in expenditures, such as bank rescues during a financial crisis, are also non-recurrent and do not characterize "regular" nor "structural" behavior of a policy authority.

4.1.1 Cyclical component of budget balance

Following, *e.g.*, Van den Noord (2000) and Swanepoel & Schoeman (2003), cyclical correction of primary deficits requires the estimation of average elasticities of revenues and expenditures to the cycle.

Take *b*** and *b** as the cyclical and structural components of the primary budget balance.

$$b^{**} = b - b^{*} \tag{3}$$

$$b^{*} = \frac{\sum_i T_i^{*} - \sum_i G_i^{*} + X}{Y^{*}} \tag{4}$$

T_i^{*} represents the structural component for the *i*th category of tax, G_i^{*} is structural component for the *i*th-category of current primary government expenditure, X refers to non-tax revenues minus net capital outlays, and Y^{*} is the level of potential output.

Define:

$$\frac{T_i^{*}}{T_i} = \left(\frac{Y^{*}}{Y}\right)^{\alpha_i} \quad and \quad \frac{G_i^{*}}{G_i} = \left(\frac{Y^{*}}{Y}\right)^{\beta_i} \tag{5}$$

where, similarly, T_i and G_i stand for the *i*th-category of actual tax and current primary expenditure, respectively. α_i and β_i represent elasticities of each category with respect to output.

Combining (3), (4) and (5), the cyclical component of the primary budget balance is:

$$b^{**} = \frac{1}{Y}\sum_i T_i \left[1 - \left(\frac{Y^{*}}{Y}\right)^{\alpha_i - 1}\right] - \frac{1}{Y}\sum_i G_i \left[1 - \left(\frac{Y^{*}}{Y}\right)^{\beta_i - 1}\right] + \frac{X}{Y}\left[1 - \left(\frac{Y^{*}}{Y}\right)^{-1}\right] \tag{6}$$

4.1.2 Output gap

The output gap is a theoretical concept capturing the difference between actual and potential output and is as a measure of business cycle. The potential output is a theoretical concept to define long run equilibrium output under stable inflation (*e.g.*, Woodford & Walsh, 2005). Empirically, output gap requires the decomposition of output time series into trend and cycle components.

Since potential output is non-observable, there are two main approaches to de-trend output (*e.g.*, European Commission, 2001). The mechanical or statistical approach, that relies on smoothing methods applied to a time series in order to get trend (*e.g.*, Hodrick-Prescott (HP), Kalman, or Blanchard-Quah decomposition), is rather pragmatic, simple to implement, and free of normative judgement. The second approach relies on the estimation of the "economic potential" of a country through a model rooted on microeconomic foundations to mimic potential output, namely through the estimation of a production function (*e.g.*, Billmeier, 2009). The latter approach is more subjective, as it relies on theoretical determinants of economic growth, is more complex to implement because it requires high quality and a larger data set but, in turn, it provides a comprehensive dynamics of potential output.

As often referred (*e.g.*, European Commission, 2001, Billmeier, 2009), the production function approach requires availability of high-quality, long-trend, data which is hard to find for Cape Verde, and several estimation problems are reported even with data collected for developed countries (see, *e.g.*, Cerra & Saxena, 2000). Finally, several studies conclude for non-statistically significant supremacy of the production function method over HP (*e.g.*, Cerra & Saxena, 2000, Mc Morow and Röger, 2001, Cotis *et al.*, 2005).

In this context, we take the most popular approach among the statistical ones, the HP, two-sided linear filter, that produces a trend series through the minimization of the squared distance between trend and actual variable, penalizing excessive jumps in trend:

$$Min_{Y_t^*}\{\sum_i (Y_t - Y_t^*)^2 + \lambda \sum_{t=2}^{T-1}[(Y_{t+1}^* - Y_t^*) - (Y_t^* - Y_{t-1}^*)]^2\} \quad (7)$$

The larger parameter λ is, the smoother is the trend series. Since we rely on annual data, we take $\lambda = 6.25$, as proposed in Ravn and Uhlig (2002).

4.2 Variable definition and data sources

Public debt dynamics

Data to compute public debt dynamics (b_t, sfa_t and debt service, $\frac{r_t}{1+g_t} d_{t-1}$) was taken from BCV[5], while data on GDP growth (g_t) was taken and *from Instituto Nacional de Estatística de Cabo Verde* (INE).[6]

Fiscal policy stance

To compute the cyclically-adjusted budget balance (CAB), we take quarterly data on nominal detailed components of the budget balance, 2004-2019, from BCV and also data on nominal GDP taken from INE. Budget data from 2000 to 2003 was taken from *Relatório do Conselho de Administração*, 2002 and 2005, BCV. Nominal data is used in accordance, among others, with Mourre *et al.* (2014), because data on budgetary components are reported in nominal terms and no proper deflator exists to convert them into real values; thus output-gap is also computed in nominal terms, under the assumption that implicit inflation is common to budgetary variables and the GDP.

[5] Accessed in July 2020 at http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx.

[6] Accessed in July 2020 at http://ine.cv/publicacoes/retropolacao-das-contas-nacionais-cabo-verde-serie-1980-2012/ and http://ine.cv/quadros/pib-componentes-trimestrais-1o-t-2007-4o-t-2019/.

In regards to budgetary variables, we follow the classification in Van den Noord (2000). Revenues are classified into tax revenues (corporate and personal income taxes, T_y , value added taxes over consumption, T_{gs}, import rights and community taxes, T_{it}, and other taxes, T_o) and non-tax revenues (social security contributions, transfers from public organizations (donations) and other revenues, X_R).

In turn, in contrast to Van den Noord (2000), we disentangle primary current expenditures into two categories: transfers and social benefits (G_1); wages, goods and services (G_2); and other expenditures, including public investment (X_E).

HP de-trended output and budgetary components are computed using *Eviews* software and data availability from 2000 to 2019. Budgetary elasticities relative to output are estimated by ordinary least squares applied to a log form of equations (5).

5. Public debt dynamics in Cape Verde: analysis of results

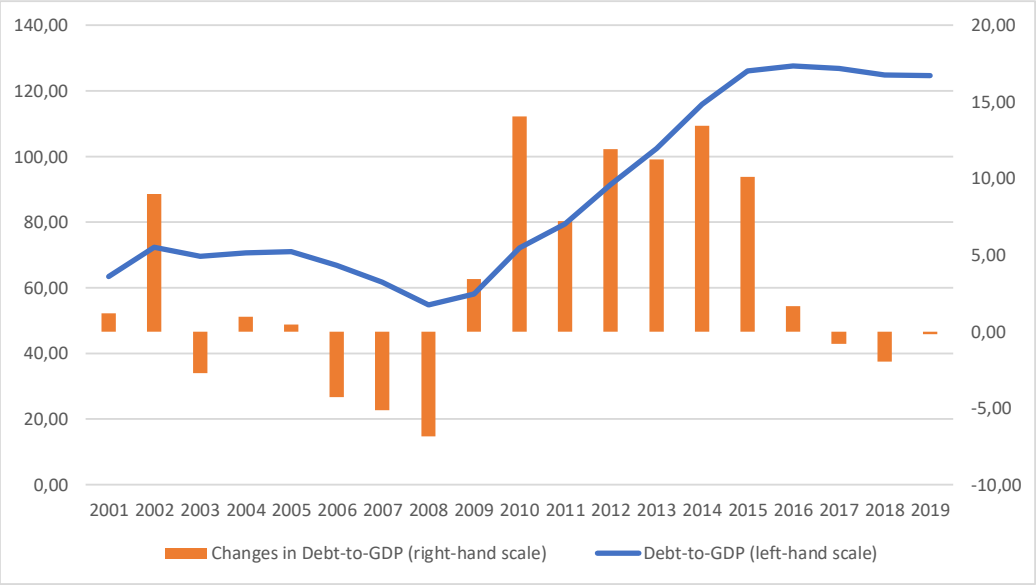
In what follows, we make a detailed assessment of the debt dynamics in Cape Verde, including the analysis of fiscal stance cyclicality.[7]

5.1 Debt dynamics in Cape Verde

Figure 3 reports debt dynamics between 2001 and 2019. From 2000 to 2016, when debt-to-GDP recorded the highest level of 127.7, public debt more than doubled: in spite of the strong debt control up to 2008, the great recession marked a turning point on debt dynamics in Cape Verde. Nevertheless, the recent trend shows a slight reduction, 2017-2019.

[7] See Table A1 in Annex.

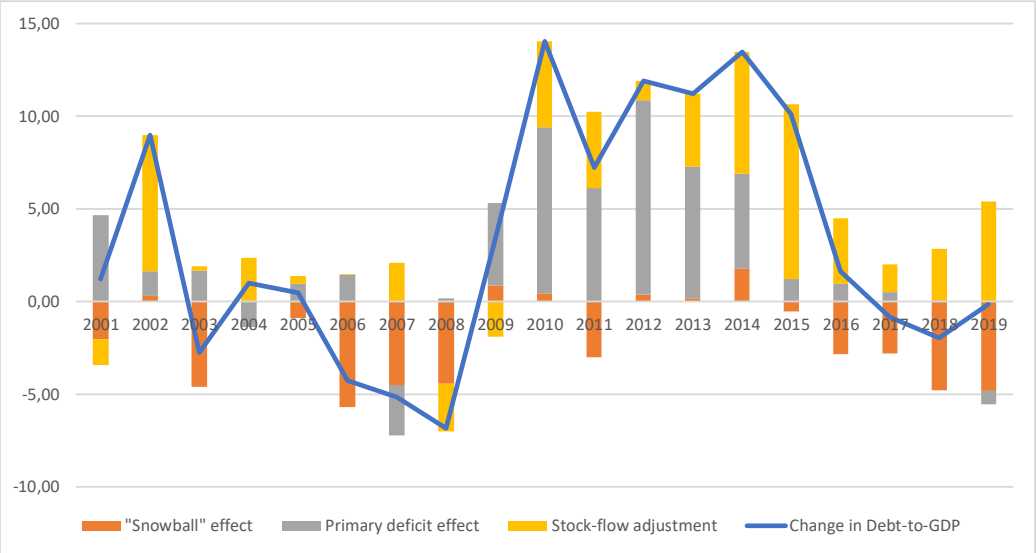
Figure 3: Debt-to-GDP, level (%) and annual change (p.p.), Cape Verde, 2001-2019



Source: BCV, http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx, accessed July 2020.

Figure 4 shows that debt accumulation, from 2009 to 2014, was mainly due to primary deficits. Stock-flow adjustments, comprising state-owned enterprises capitalization, on-lending and, mostly, the Cape Verdean escudo depreciation against the USD, were also important in 2014-16 and, more recently, in 2019 (IMF, 2018b, and Correia *et al.*, 2020). The recent stabilization effort is mostly due to the "snowball" effect, with an average real growth rate, according to BCV, of 4.7% (2016-19), higher than the implicit average real interest rate.

Figure 4: Breakdown of debt-to-GDP annual changes, Cape Verde, 2001-2019 (p.p.)



Source: BCV, http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx, accessed July 2020, and own computations.

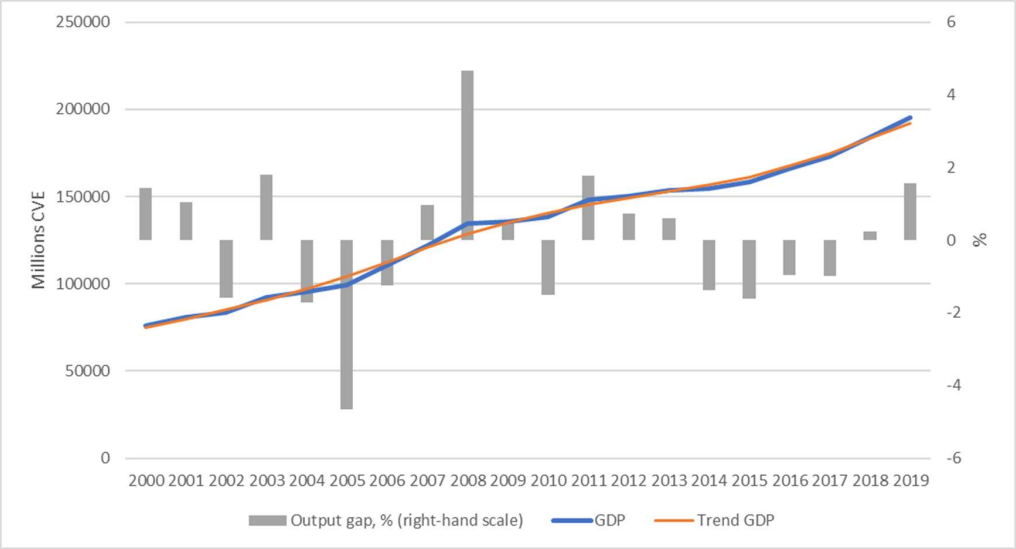
Overall, evidence of public debt dynamics for Cape Verde confirms stylized evidence from the literature: stock-flow adjustments are more important during debt increases while debt consolidation efforts strongly rely on the "snowball" effect. Indeed, taking average negative "snowball" effects 2018-19, and abstracting from stock-flow contributions, debt stabilization at current 124.7% of GDP is enforced even incurring on primary deficits of around 6% of GDP (see (2), above).

5.2 Fiscal policy stance in Cape Verde

5.2.1 Trend and cyclical output

Figure 5 shows effective and potential output (in millions of Cape Verdean escudos, CVE), and the output gap (as percentage of potential output).

Figure 5: Effective and trend output (CVE millions) and output gap (% trend output), HP filter adjusted, Cape Verde, 2000-2019



Source: BCV, https://www.bcv.cv/pt/Estatisticas/serieslongasdaeconomia/serieslongas/Paginas/Teste2.aspx, and BCV (2020), accessed July 2020, and own computations.

Overall, we can identify 4 periods of positive output gaps: 2000-2001, 2007-2009, 2011-2013 and 2018-2019. Negative output gaps are identified in 2004-2006, 2010 and in the 2014-2017 period.

5.2.2 Structural primary budget

Following the computation of the structural components of the budget balance using (5), we proceed with the assessment of the cyclical component of the primary budget balance as in equation (6), in order to compute CAB as defined by (4), above.[8] Positive and statistically significant elasticities with respect to output were only found for taxes, namely 1.23 for income taxes and 2.71 for taxes on international transactions.[9]

Table 1 shows the changes in the structural primary budget balance (row 8), consisting of changes in the general government budget balance (row 1) adjusted for interest payments (row 2), cycle and temporary measures (donations), rows (4) and (6), respectively. It represents the policy stance, that is, whether fiscal policy was deliberately expansionary or contractionary.

[8] See Table A2 in Annex.
[9] See Table A3 in Annex.

Table 1: Structural primary budget, Cape Verde, 2000-2019 (% GDP)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
(1) General budget balance	**-6.69**	**-6.30**	**-3.91**	**-3.82**	**-0.77**	**-2.89**	**-3.15**	**1.19**	**-1.55**	**-5.77**
(2) Interest payments	1.35	1.66	2.58	2.16	2.16	1.94	1.73	1.54	1.37	1.34
(3) Primary budget balance = (1)+(2)	-5.34	-4.64	-1.33	-1.66	1.38	-0.95	-1.42	2.73	-0.18	-4.43
(4) Cyclical component	0.41	0.31	-0.47	0.50	-0.30	-0.97	-0.27	0.17	0.92	0.11
(5) Cyclically-adjusted primary budget balance = (3)-(4)	**-5.75**	**-4.96**	**-0.86**	**-2.17**	**1.68**	**0.01**	**-1.15**	**2.56**	**-1.11**	**-4.54**
(6) Donations	4.86	5.15	7.43	4.51	7.59	6.35	5.70	4.44	4.85	5.57
(7) Structural primary budget balance(adjusted for cycle and temporary measures) = (5)-(6)	**-10.60**	**-10.11**	**-8.29**	**-6.67**	**-5.91**	**-6.33**	**-6.84**	**-1.88**	**-5.95**	**-10.11**
(8) Changes in structural primary budget balance (p.p.)	**-**	**0.50**	**1.82**	**1.62**	**0.77**	**-0.43**	**-0.51**	**4.96**	**-4.07**	**-4.16**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
(1) General budget balance	**-10.51**	**-7.66**	**-12.13**	**-9.26**	**-7.36**	**-3.79**	**-3.49**	**-3.07**	**-2.60**	**-1.82**
(2) Interest payments	1.56	1.54	1.66	2.16	2.22	2.58	2.54	2.58	2.52	2.54
(3) Primary budget balance = (1)+(2)	-8.96	-6.12	-10.47	-7.11	-5.14	-1.21	-0.95	-0.48	-0.08	0.72
(4) Cyclical component	-0.41	0.43	0.20	0.14	-0.30	-0.31	-0.19	-0.19	0.05	0.29
(5) Cyclically-adjusted primary budget balance = (3)-(4)	**-8.55**	**-6.55**	**-10.67**	**-7.25**	**-4.84**	**-0.90**	**-0.76**	**-0.29**	**-0.13**	**0.43**
(6) Donations	6.71	2.99	2.82	2.63	1.67	2.38	2.36	3.52	1.40	3.25
(7) Structural primary budget balance(adjusted for cycle and temporary measures) = (5)-(6)	**-15.26**	**-9.54**	**-13.49**	**-9.89**	**-6.51**	**-3.28**	**-3.12**	**-3.81**	**-1.53**	**-2.81**
(8) Changes in structural primary budget balance (p.p.)	**-5.15**	**5.72**	**-3.95**	**3.60**	**3.38**	**3.22**	**0.16**	**-0.69**	**2.28**	**-1.28**

Source: Own computations based on BCV data at http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx and *Relatório Anual* 2002, 2005, and INE, http://ine.cv/pib-e-componentes-anual/, accessed July 2020.

Fiscal policy was expansionary in eight out of the 19 years under analysis (2005-2006, 2008-2010, 2012 and 2017-2019), while active debt correction adjustments proceeded in the remaining years. The strongest expansion occurred in 2010 (-5.15 p.p.) while the strongest effort for debt correction occurred in 2011 (5.72 p.p.).

Donations have been an important component for the government budget, in particular up until 2010 (5% to 7% of potential GDP), but have decreased substantially in more recent years (1%-3%), since graduation of Cape Verde from the list of least developed countries in 2007.[10]

Another stylized fact, taken from Table 1, is that the cyclical component of the budget balance is very modest. Automatic stabilizers represent, on average, below 0.5% of GDP; only in 2005 and 2008 they represented close to 1%. This means that the "automatic" stabilization role of the fiscal policy is small, and thus counter-cyclical management has to rely strongly on discretionary measures, subject to larger implementation delays and thus less effective. The small role of fiscal stabilizers is a common feature of African countries (see,

[10] https://www.un.org/development/desa/dpad/least-developed-country-category-cabo-verde.html, accessed August 2020.

e.g., Slimane & Tahar, 2010, and Lledó *et al.*, 2011, for evidence in North- and Sub-Saharan Africa, respectively) and partially results from the absence of unemployment protection schemes. Only 6% of SSA countries pay unemployment benefits, Cape Verde included but only since 2016 (Djankov and Georgineva, 2020).[11]

Debt interest payments exhibited a downward trend from 2004 to 2009, following the debt reduction path (see Figure 3); from then onwards, with the increase in debt, they show an increasing path, reaching over 2.5% of GDP after 2015.

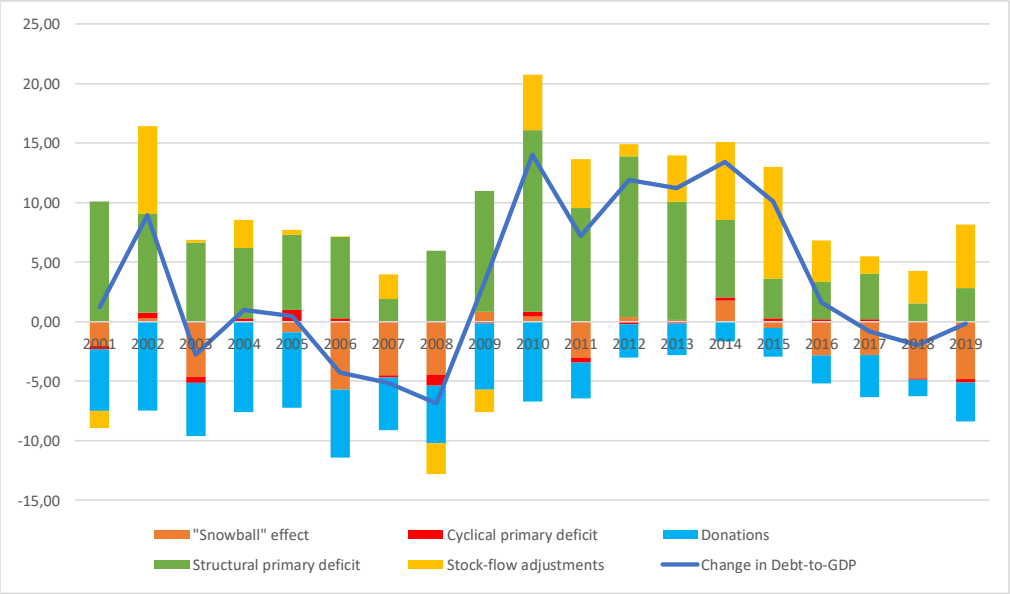
Overall, the government budget balance was positive only in 2007 (1.19%), benefiting from an important contractionary effort, low interest payments, favorable cycle effects and significant donations. Worse performances were achieved in 2010 (-10.51%) and 2012 (-12.13%), in the aftermath of the great recession, resulting from the strong discretionary effort to attenuate the crisis. Even with smaller donations, the general budget has consistently evolved positively from 2012 onwards, reaching -1.82% of GDP in 2019, the best performance since 2008.

5.2.3 Fiscal policy stance: pro-cyclical or counter-cyclical?

A more detailed breakdown of public debt changes is captured in Figure 6. Primary deficits contributed to debt increases mainly through structural, discretionary, deficits, 2009-2014. Indeed, debt accumulation was smoothed by donations, particularly important up to 2010, and the cyclical component of the primary deficit is rather insignificant in Cape Verde.

[11] https://blogs.worldbank.org/developmenttalk/its-time-expand-unemployment-protections (accessed August 2020).

Figure 6: Detailed breakdown of debt-to-GDP annual changes, Cape Verde, 2001-2019 (p.p.)

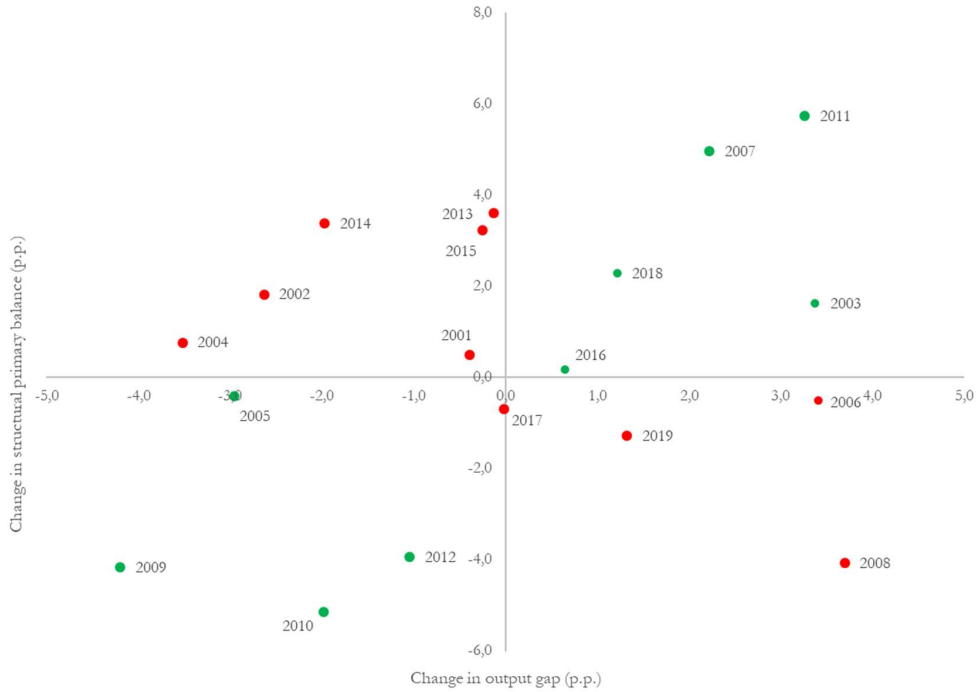


Source: Idem.

What is still to assess is: was this debt accumulation path driven by adequate counter-cyclical discretionary policies? By pro-cyclical investment-based policies? Or, instead, by pro-cyclical, political motivated, policies?

Figure 7 plots the relation between business cycle and the estimated fiscal policy stance in Cape Verde, 2001-2019. A positive cycle phase (expansion) is identified with a positive change in the output gap between two successive years (i.e., when the growth rate of actual output exceeds that of potential output); otherwise, a recession is identified. Records in the second and fourth quadrants identify pro-cyclical behavior (red dots) while those in the first and third quadrants identify counter-cyclical policy (green dots).

Figure 7: Fiscal policy and cycle in Cape Verde, 2001-2019



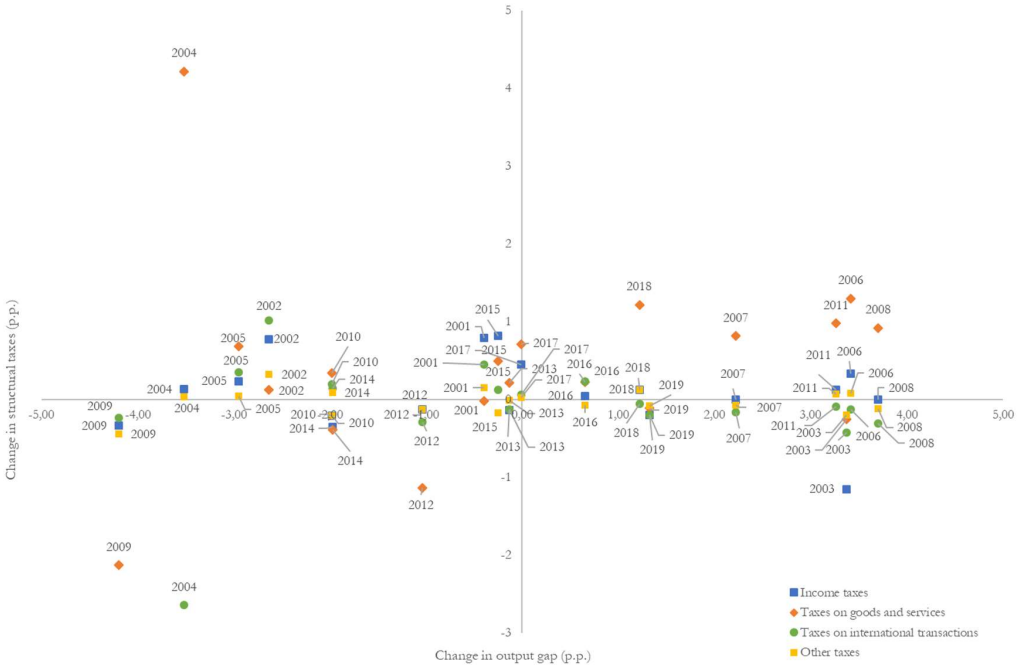
Source: Own computations based on BCV data, accessed July 2020 and *Relatório Anual* 2002, 2005.
Note: pro-cyclical fiscal policy (red dots); counter-cyclical fiscal policy (green dots).

From the analysis of Figure 7, we conclude for no deficit bias in Cape Verde. Indeed, only in 2006, 2008 and 2019 we find pro-cyclical fiscal policy during expansions. In periods of higher debt accumulation, counter-cyclical expansionary policy counteracted recession (2009, 2010 and 2012), since automatic stabilizers are rather unresponsive. However, we can still identify two periods of fiscal consolidation during recessions: at the beginning of 2000s and in 2013-15. Consolidation effort continued afterwards, in 2016 and 2018, but under favorable cycle.

5.2.4 Budget components and cycle

In order to inspect which budget components operate more counter or pro-cyclical in Cape Verde, Figure 8 plots the change in structural taxes against output gap changes.

Figure 8: Fiscal revenues and cycle in Cape Verde, 2001-2019



Source: Own computations based on BCV data at http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx, and *Relatório Anual* 2002, 2005, and INE, http://ine.cv/pib-e-componentes-anual/, accessed July 2020.

Apparently, discretionary taxation is rather neutral in Cape Verde, in particular revenues on international transactions and other taxes. Revenues acting more counter-cyclically are taxes on goods and services – most of orange dots are placed in the first and third quadrants. Together with income taxes, they were also the most important revenues in periods of pro-cyclical policy of debt consolidation during downturns (second quadrant).

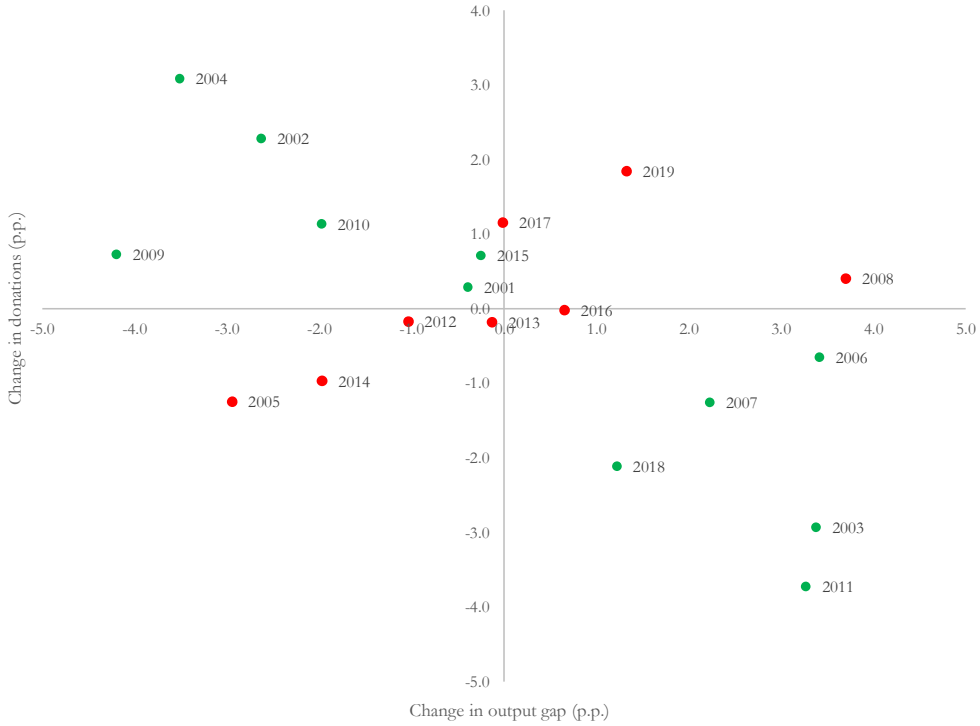
In contrast, other net expenditures (mostly capital expenditure net of non-tax revenue) are clearly counter-cyclical: most of the yellow dots are placed in the second and fourth quadrants of Figure 9. Current expenditure on wages, goods and services and subsidies are the second most counter-cyclical instrument, while transfers and social benefits are seldom used. Expenditure bias during expansions is small, and includes strong investment effort in 2008. Public debt consolidation episodes mostly rely on cuts in other net expenditures.

Figure 9: Fiscal expenditures and cycle in Cape Verde, 2001-2019

Source: *Idem*.

Besides their strong contribution to a slower increase in debt in 2009-10, Figure 10 shows that, during the debt accumulation period, donations acted as increasing resources to counter-cyclical policies; its evolution was, however, negative for stabilization in 2012 and 2014. In most of the time, donations enabled counter-cyclical fiscal policy: they exhibit, on average, a negative relation with the cycle (2nd and 4th quadrants).

Figure 10: Donations and cycle in Cape Verde, 2001-2019



Source: Own computations based on BCV data at http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx, and *Relatório Anual* 2002, 2005, and INE, http://ine.cv/pib-e-componentes-anual/, accessed July 2020.
Note: pro-cyclical donations (red dots); counter-cyclical donations (green dots).

6. Concluding remarks

In contrast with the dynamics observed in SSA countries, and in West Africa in particular, the recent dynamics of public debt increase in Cape Verde, in the aftermath of the 2008-09 crisis, crucially resulted from discretionary accumulation of primary deficits.

However, instead of political-driven deficits as evidence suggests to be typical in African countries, the rising trend in debt resulted from counter-cyclical fiscal policy in Cape Verde, relying mostly on taxes on goods and services and on other, mostly capital, net expenditures. In turn, pro-cyclical consolidations were operated mostly through income taxes and also on other net expenditures. Deficit-bias in expansions is, apparently, absent in Cape Verde, and the most important episode is on 2008, with strong effort in public investment expenditures.

We thus conclude that debt reversion may be an easy task to perform because debt bias in Cape Verde does not mimic deficit bias due to political-cycle motivations.

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Annex

Table A1 – Debt dynamics, Cape Verde, 2001-2019

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Debt-to-GDP (d_t)	**63.38**	**72.35**	**69.60**	**70.57**	**71.03**	**66.75**	**61.60**	**54.76**	**58.17**	**72.21**	**79.40**	**91.29**	**102.50**	**115.93**	**126.03**	**127.66**	**126.83**	**124.85**	**124.69**
Change in Debt-to-GDP	**1.19**	**8.97**	**-2.74**	**0.97**	**0.46**	**-4.28**	**-5.15**	**-6.84**	**3.40**	**14.04**	**7.20**	**11.89**	**11.21**	**13.43**	**10.10**	**1.63**	**-0.83**	**-1.98**	**-0.16**
Snowball effect ($\lambda_t d_{t-1}$):	**-2.04**	**0.29**	**-4.62**	**0.00**	**-0.89**	**-5.72**	**-4.52**	**-4.45**	**0.86**	**0.43**	**-3.03**	**0.38**	**0.15**	**1.75**	**-0.53**	**-2.85**	**-2.81**	**-4.80**	**-4.82**
Interest	1.66	2.58	2.16	2.16	1.94	1.73	1.54	1.37	1.34	1.56	1.54	1.66	2.16	2.22	2.58	2.54	2.58	2.52	2.54
Output growth	3.69	2.29	6.78	2.16	2.83	7.45	6.06	5.82	0.48	1.13	4.57	1.28	2.00	0.47	3.11	5.38	5.39	7.32	7.36
Primary deficit (-b_t):	**4.64**	**1.33**	**1.66**	**-1.38**	**0.95**	**1.42**	**-2.73**	**0.18**	**4.43**	**8.96**	**6.12**	**10.47**	**7.11**	**5.14**	**1.21**	**0.95**	**0.48**	**0.08**	**-0.72**
Ciclical component primary deficit	-0.31	0.47	-0.50	0.30	0.97	0.27	-0.17	-0.92	-0.11	0.41	-0.43	-0.20	-0.14	0.30	0.31	0.19	0.19	-0.05	-0.29
Donations	-5.15	-7.43	-4.51	-7.59	-6.35	-5.70	-4.44	-4.85	-5.57	-6.71	-2.99	-2.82	-2.63	-1.67	-2.38	-2.36	-3.52	-1.40	-3.25
Structural component primary deficit	10.11	8.29	6.67	5.91	6.33	6.84	1.88	5.95	10.11	15.26	9.54	13.49	9.89	6.51	3.28	3.12	3.81	1.53	2.81
Stock-flow adjustments	**-1.42**	**7.35**	**0.21**	**2.35**	**0.40**	**0.02**	**2.09**	**-2.57**	**-1.90**	**4.65**	**4.11**	**1.04**	**3.95**	**6.55**	**9.42**	**3.53**	**1.49**	**2.74**	**5.38**

Source: BCV, http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx, accessed July 2020, and own computations.

Table A2 – Cyclical and structural components of budget balance, Cape Verde, 2000-2019

Year	Ty	Tgs	Tit	To	G1	G2	PIB	Ty*	Tgs*	Tit*	To*	G1*	G2*	Y*	X	Ty[1-(Y*/Y)^(aty-1)]	Tgs[1-(Y*/Y)^(atgs-1)]	Tit[1-(Y*/Y)^(atit-1)]	To[1-(Y*/Y)^(ato-1)]	1/Y ∑Ti [1-(Y*/Y)^(ai-1)	G1[1-(Y*/Y)^(β1-1)]	G2[1-(Y*/Y)^(β2-1)] / Y ∑Gi[1-(Y*/Y)^(βi-1)]	X/Y [1-(Y*/Y)^(-1)]	b**	b	donations/y*	b excluding donations	b*
2000	3905.0	1888.0	4695.0	701.0	6837.0	7620.0	75857.1	4140.9	1009.80	5172.7	753.8	6277.3	6259.2	74778.7	-783.0	12.84	-27.23	113.56	-10.11	0.001174	-98.60	-109.89	-0.002748	0.00015	0.0041	-0.0534	0.0486	-0.1020	-0.1060
2001	4788.0	2001.0	5329.0	869.0	5717.0	7641.0	80647.0	4596.8	1877.90	5357.5	910.4	5390.9	8303.2	79810.5	-3375.0	11.47	-20.97	94.17	-9.11	0.000937	-59.92	-80.08	-0.001736	0.00044	0.0031	-0.0464	0.0515	-0.0979	-0.1011
2002	5587.0	2238.0	6114.0	1198.0	4890.0	8422.0	83669.0	5014.9	2886.51	5465.8	1058.5	4594.0	10565.0	85014.9	-2934.0	-20.54	35.43	-169.14	18.97	-0.001617	77.42	133.34	0.002519	-0.00056	-0.0047	-0.0133	0.0743	-0.0876	-0.0829
2003	5146.6	2160.3	6742.0	1096.4	2644.8	12407.3	92324.7	5388.1	4195.83	5416.7	1183.2	4028.4	13156.2	90698.3	-1629.3	21.00	-38.74	201.83	-19.66	0.001781	-47.43	-222.49	-0.002924	0.00032	0.0050	-0.0166	0.0451	-0.0617	-0.0667
2004	5394.6	6398.8	4111.9	1206.7	3371.5	16440.5	95282.2	5800.8	5862.32	5232.9	1291.6	3883.2	15845.8	96951.5	4018.8	-21.59	110.18	-123.95	20.78	-0.000153	58.05	283.08	0.003580	0.00073	-0.0030	0.0138	0.0759	-0.0621	-0.0591
2005	5815.3	7581.9	4387.2	1343.1	3961.5	19233.4	99265.8	6298.8	7616.74	5149.1	1377.2	4126.0	18283.0	104126.0	3123.9	-64.29	353.90	-373.67	62.69	-0.000215	184.91	897.75	0.010907	0.00147	-0.0097	-0.0095	0.0635	-0.0730	-0.0633
2006	6921.5	9638.9	5070.4	1537.0	4981.0	21692.2	110900.0	6862.8	9275.69	5220.8	1419.6	4642.8	20211.8	112305.9	1934.3	-20.08	120.66	-110.41	19.24	0.000085	62.35	271.55	0.003011	0.00022	-0.0027	-0.0142	0.0570	-0.0712	-0.0684
2007	7655.4	11356.3	5591.2	1565.6	5443.9	22090.8	121973.7	7396.3	10650.18	5381.4	1393.4	5292.9	21528.7	120797.6	4692.1	17.04	-110.57	91.87	-15.24	-0.000139	-53.00	-215.08	-0.002198	-0.00037	0.0017	0.0273	0.0444	-0.0171	-0.0188
2008	8525.9	13285.6	6124.4	1516.5	6009.4	21285.4	134698.4	7812.0	11609.37	5540.3	1291.4	5989.9	22366.7	128682.8	-2400.8	89.12	-621.06	460.25	-70.89	-0.001058	-280.92	-995.03	-0.009473	0.00083	0.0092	-0.0018	0.0485	-0.0503	-0.0595
2009	8060.8	11080.6	5438.1	996.6	6670.9	23626.7	135879.1	8064.3	12135.36	5640.5	1134.6	6671.8	22948.9	135231.3	-1303.8	8.85	-53.08	44.26	-4.77	-0.000035	-31.96	-113.18	-0.001068	0.00005	0.0011	-0.0443	0.0557	-0.1001	-0.1011
2010	7892.2	12014.8	5633.6	742.6	7831.4	23094.8	138568.5	8221.6	12478.46	5718.5	979.4	7279.4	23325.6	140675.2	-7767.8	-27.44	179.93	-147.25	11.12	0.000118	117.28	345.86	0.003342	-0.00084	-0.0041	-0.0896	0.0671	-0.1567	-0.1526
2011	8678.3	13839.6	6227.7	871.6	8286.0	24028.4	147924.2	8351.9	12720.22	5778.2	860.5	7753.5	23655.1	145350.5	-6351.9	34.96	-245.05	184.13	-15.43	-0.000280	-146.71	-425.45	-0.003868	0.00076	0.0043	-0.0612	0.0299	-0.0910	-0.0954
2012	8615.5	12511.9	5777.7	708.9	7975.1	23576.4	150351.3	8470.4	12867.99	5810.2	774.7	8123.1	24059.1	149256.0	-11803.9	14.48	-91.81	71.78	-5.20	-0.000072	-58.52	-173.00	-0.001540	0.00058	0.0020	-0.1047	0.0282	-0.1329	-0.1349
2013	8595.7	13135.6	5699.7	711.1	8224.8	23815.9	153723.2	8644.6	13108.23	5876.8	720.4	8502.5	24719.1	152802.3	-7027.2	11.87	-79.16	58.26	-4.29	-0.000087	-49.57	-143.53	-0.001256	0.00028	0.0014	-0.0711	0.0263	-0.0974	-0.0989
2014	8051.0	12847.7	5755.0	866.1	8708.0	25145.4	154435.7	8965.2	13570.43	6035.1	685.6	8982.5	25739.0	156575.2	-1600.2	-25.52	175.55	-137.00	11.83	0.000161	118.99	343.59	0.002995	-0.00014	-0.0030	-0.0514	0.0167	-0.0680	-0.0651
2015	9561.0	14038.1	6081.6	617.3	9481.5	27424.1	158699.1	9515.0	14388.43	6314.1	657.0	9609.0	27078.5	161307.8	4684.2	-35.92	227.03	-171.94	9.98	0.000184	153.34	443.51	0.003761	0.00048	-0.0031	-0.0121	0.0238	-0.0359	-0.0328
2016	10077.9	14941.2	6812.7	527.8	10051.7	29740.1	165782.2	10230.7	15580.46	6697.7	649.7	10384.5	28602.3	167391.1	5857.2	-22.41	143.62	-113.45	5.07	0.000077	96.62	285.86	0.002307	0.00034	-0.0019	-0.0095	0.0236	-0.0331	-0.0312
2017	11296.9	16844.7	7223.9	603.8	11419.7	29311.1	173097.0	11056.3	17108.67	7132.9	672.9	11290.8	30230.2	174798.6	3922.5	-25.45	163.97	-121.85	5.88	0.000130	111.16	285.32	0.002291	0.00022	-0.0019	-0.0048	0.0352	-0.0400	-0.0381
2018	12253.0	19887.0	7733.0	860.0	12520.0	31339.0	183698.0	11911.1	18832.95	7584.7	716.1	12256.5	32064.4	183246.1	2984.6	6.94	-49.04	32.50	-2.12	-0.000064	-30.88	-77.29	-0.000589	-0.00004	0.0005	-0.0008	0.0140	-0.0148	-0.0153
2019	12673.9	20656.6	8011.0	748.3	13284.8	35066.7	195202.0	12753.3	20570.93	8033.0	757.8	13230.9	34059.7	192177.5	7667.9	45.44	-325.09	211.08	-11.78	-0.000412	-209.07	-551.87	-0.003898	-0.00062	0.0029	0.0072	0.0325	-0.0253	-0.0281

Source: BCV data at http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx,, accessed July 2020 and *Relatório Anual* 2002, 2005, and INE, http://ine.cv/pib-e-componentes-anual/, accessed July 2020, and own computations.

Notes: "*" refer to trend variables; "**" refers to the cyclical component of the variables. Y: nominal GDP; Ty: income taxes; Tgs: taxes on good and services; Tit: taxes on international transactions; To: other taxes; G1: transfers and social benefits; G2: expenditures on wages, goods and services; X: other net revenues; b: primary budget balance; α and β: elasticities of tax and primary expenditures, respectively, relative to output (see Table A3).

Table A3 – Elasticities of budget components to output, Cape Verde

Dependent Variable: LOG(TGSDIV)
Method: Least Squares
Date: 08/05/20 Time: 10:06
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002398	0.051226	0.046808	0.9632
LOG(YDIV)	1.387359	2.671646	0.519290	0.6099

R-squared	0.014760	Mean dependent var	0.002862
Adjusted R-squared	-0.039975	S.D. dependent var	0.224611
S.E. of regression	0.229056	Akaike info criterion	-0.015057
Sum squared resid	0.944403	Schwarz criterion	0.084516
Log likelihood	2.150574	Hannan-Quinn criter.	0.004380
F-statistic	0.269662	Durbin-Watson stat	1.379892
Prob(F-statistic)	0.609885		

Dependent Variable: LOG(TITDIV)
Method: Least Squares
Date: 08/05/20 Time: 10:06
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004834	0.018569	0.260323	0.7976
LOG(YDIV)	2.707751	0.968459	2.795938	0.0119

R-squared	0.302792	Mean dependent var	0.005740
Adjusted R-squared	0.264058	S.D. dependent var	0.096788
S.E. of regression	0.083032	Akaike info criterion	-2.044545
Sum squared resid	0.124097	Schwarz criterion	-1.944972
Log likelihood	22.44545	Hannan-Quinn criter.	-2.025107
F-statistic	7.817269	Durbin-Watson stat	1.815347
Prob(F-statistic)	0.011940		

Dependent Variable: LOG(TODIV)
Method: Least Squares
Date: 08/05/20 Time: 10:06
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013442	0.029495	0.455740	0.6540
LOG(YDIV)	1.235061	1.538271	0.802889	0.4325

R-squared	0.034575	Mean dependent var	0.013855
Adjusted R-squared	-0.019060	S.D. dependent var	0.130646
S.E. of regression	0.131885	Akaike info criterion	-1.119129
Sum squared resid	0.313087	Schwarz criterion	-1.019555
Log likelihood	13.19129	Hannan-Quinn criter.	-1.099691
F-statistic	0.644631	Durbin-Watson stat	1.839539
Prob(F-statistic)	0.432513		

Dependent Variable: LOG(TYDIV)
Method: Least Squares
Date: 08/05/20 Time: 10:07
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001770	0.011164	0.158587	0.8758
LOG(YDIV)	1.226785	0.582252	2.106967	0.0494

R-squared	0.197836	Mean dependent var	0.002181
Adjusted R-squared	0.153272	S.D. dependent var	0.054250
S.E. of regression	0.049920	Akaike info criterion	-3.062152
Sum squared resid	0.044856	Schwarz criterion	-2.962578
Log likelihood	32.62152	Hannan-Quinn criter.	-3.042714
F-statistic	4.439311	Durbin-Watson stat	2.008244
Prob(F-statistic)	0.049411		

Dependent Variable: LOG(G1DIV)
Method: Least Squares
Date: 08/05/20 Time: 10:07
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012445	0.025248	0.492899	0.6280
LOG(YDIV)	-0.285060	1.316798	-0.216480	0.8310

R-squared	0.002597	Mean dependent var	0.012349
Adjusted R-squared	-0.052815	S.D. dependent var	0.110029
S.E. of regression	0.112897	Akaike info criterion	-1.430041
Sum squared resid	0.229423	Schwarz criterion	-1.330468
Log likelihood	16.30041	Hannan-Quinn criter.	-1.410604
F-statistic	0.046863	Durbin-Watson stat	1.472872
Prob(F-statistic)	0.831048		

Dependent Variable: LOG(G2DIV)
Method: Least Squares
Date: 08/05/20 Time: 10:07
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002847	0.018242	0.156066	0.8777
LOG(YDIV)	-0.112808	0.951401	-0.118571	0.9069

R-squared	0.000780	Mean dependent var	0.002809
Adjusted R-squared	-0.054732	S.D. dependent var	0.079425
S.E. of regression	0.081569	Akaike info criterion	-2.080085
Sum squared resid	0.119764	Schwarz criterion	-1.980512
Log likelihood	22.80085	Hannan-Quinn criter.	-2.060647
F-statistic	0.014059	Durbin-Watson stat	1.379406
Prob(F-statistic)	0.906929		

Source: Own computations based on BCV data at http://www.bcv.cv/vPT/Publicacoes%20e%20Intervencoes/Paginas/PublicacoeseIntervencoes.aspx,, accessed July 2020 and *Relatório Anual* 2002, 2005, and INE, http://ine.cv/pib-e-componentes-anual/, accessed July 2020.

Notes: ". DIV" refers to "trend variables/effective variables". Y: nominal GDP; TY: income taxes; TGS: taxes on good and services; TIT: taxes on international transactions; TO: other taxes; G1: transfers and social benefits; G2: expenditures on wages, goods and services.

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