The Sustainability of Portuguese Fiscal Policy in the Period of the *Estado Novo*, 1933-1974*

Ricardo Ferraz
ISEG, University of Lisbon

ABSTRACT

From 1933 to 1974, Portugal was governed by a political regime known as the *Estado Novo* (New State), which authoritatively upheld the principle of maintaining sound public finances. This paper accordingly sets out to test the sustainability of Portuguese fiscal policy during that period. Using tests for stationarity and cointegration, we find sufficient evidence that fiscal policy sustainability characterised the period of the *Estado Novo* as a whole. However, the onset of colonial warfare in 1961 may have marked a shift towards unsustainable fiscal policy.

1. Introduction

The question whether current fiscal policy is sustainable is an important one. If the answer is negative, policymakers may be forced to adopt corrective measures affecting social welfare (e.g. tax increases, reductions in social spending, etc.).

The literature offers quite a broad consensus on the definition of fiscal policy sustainability. According to Blanchard et al. (1990), "a sustainable fiscal policy can be defined as a policy such that the ratio of debt to GNP eventually converges back to its initial level." In practice, this type of sustainability requires that today's public debt must be equal to the excess of future primary surpluses over

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primary deficits calculated at present-day values, as stated by Chalk and Hemming (2000).

Thus, as Cross and Ramón (2003) observe, this consensual concept of sustainability "refers to the future implications of current fiscal policies and, more precisely, to the question of whether the government can continue to pursue its set of budgetary policies without endangering its solvency". These authors consider that "a fiscal policy stance can be thought of as unsustainable if over time it leads the government away from solvency."

More recently, the European Central Bank (2011) defined fiscal sustainability as the ability of a government to meet its debt obligations in the long run. If a government is indebted in the present, this means that in the future it will have to run sufficient primary surpluses to pay off the charges incurred through its debt.

These apparently similar definitions are precisely those that have guided a large number of works designed to test the sustainability of fiscal policy empirically, in one or more countries.

In the case of Portugal, several interesting studies have tested the sustainability of fiscal policy (see, for example, Afonso, 2004, and Marinheiro, 2006). None, however, have sought to show that Portuguese fiscal policy was (or was not) sustainable specifically and exclusively over the time horizon of 1933-1974.

During that period, Portugal was governed by a political regime known as the *Estado Novo* (New State), which authoritatively upheld the principle of maintaining sound public finances. Indeed, the obligation of maintaining a balanced public budget was a constitutional rule.

This leads to an interesting question: did the orthodox fiscal principles of the *Estado Novo* result in sustainable fiscal policy in practice? The aim of this paper is precisely to assess whether fiscal policy was in fact sustainable during that period in the economic history of Portugal. In order to do this, we must first select, collect and analyse some important data and variables, using both primary and secondary sources. Moreover, we also need a theoretical framework within which to assess the sustainability of fiscal policy empirically.

The introduction (Section 1) is followed by an analysis of some key public finance variables during the *Estado Novo* period (Section 2). Section 3 sets out a theoretical framework and shows how it can be used to assess the sustainability of fiscal policy. Next, using the data presented previously and applying the techniques specified, the sustainability of Portuguese fiscal policy during the period is tested (Section 4). The results are then compared with those found in the previous literature (Section 5), and the concluding section documents the main findings (Section 6).

2. Public finances under the *Estado Novo*

The *Estado Novo* political regime in Portugal was nationalist, corporatist, anti-liberal, authoritarian and anti-democratic.[1] The regime began with the Constitution of 11 April 1933 and ended on 25 April 1974, when it was overthrown by the *Movimento das Forças Armadas* (Armed Forces Movement).

Under this regime, the Portuguese territory comprised the home country (the "metropolis") and the colonies in Africa, Asia and Oceania. Sovereignty was exercised by the President of the Republic, the National Assembly (parliament), the Government and the Courts. However, the President did not perform any government functions directly, because he chose a President of the Council of Ministers (head of government), in whom he delegated the real power to command "the nation" (see Commissioner-General of Portugal, 1958).

The first President of the Council of Ministers (1933-1968), and the dominant figure throughout the entire regime, was António de Oliveira Salazar (1889-1970), who transformed the *Estado Novo* into the mirror of his own ideological thinking.[2]

In terms of public finances, Salazar accepted only balanced pub-

[1] There was censorship, lack of freedom of expression, and political repression. For the characteristics of the *Estado Novo*, see, among others, Cruz (1982), Cabral (1983), Georgel (1985), Rosas (1994, 2001), Léonard (1998) and Torgal (2009).

[2] The *Estado Novo* established the concepts of God, Homeland, Authority, Family and Labour as the pillars upon which the regime was founded (see Salazar, 1945).

lic accounts. This intransigence was a response to the fiscal and monetary problems that had plagued Portugal, in the 1920s. In fact it was through the Military Dictatorship (1926-1933)[3] that Salazar came to power.[4] As Minister of Finance in that transitional military regime, between 1928 and 1932 Salazar succeeded in producing the first fiscal surpluses for many years. This marked a new beginning for the Portuguese public finances, leaving the fiscal and monetary problems of the 1920s behind. It also gave Salazar two crucial advantages:

1) sufficient reputational credit to hold power as "the saviour of the nation" and to impose a new regime centred on his own person;
2) factual evidence to support a strictly orthodox fiscal policy during the period of the *Estado Novo*.[5]

The principle of sound finances was invariably present in Salazar's public speeches – both before and during the *Estado Novo*.[6] For example, in 1929, in a speech entitled "Policy of Truth, Policy of Sacrifice, National Policy" he defended a "balanced budget," underscored "the seriousness of accounts", and proclaimed that the "government should always be a good person," which required "defending the public budget with care and vigour."[7]

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[3] The Revolution of May 1926 installed a military dictatorship (1926-1933), overthrowing the First Republic (1910-1926).

[4] In the first phase of the new regime, Oliveira Salazar was invited to be Minister of Finance. He accepted this position and took office on 3 June 1926, resigning on 19 June for political reasons. In a second phase, beginning in April 1928, he returned as Minister of Finance in the 50th government. He remained as Minister of Finance in the 51st government (appointed on 10 November 1928), 52nd government (8 July 1929), 53rd government (21 January 1939) and finally as both Minister of Finance and President of the Council of Ministers in the 54th government (5 July 1932). Salazar was President of the Council of the *Estado Novo* from April 1933 to September 1968 (until August 1940 he held this position together with that of Minister of Finance). In September 1968, Marcelo Caetano replaced Salazar, becoming the second President of the Council of Ministers during the *Estado Novo*. See Guimarãis et al. (2011).

[5] In this regard, see the work of Sousa Franco (1982). The author – who developed a historical periodisation for the Portuguese public finances – described 1933-1974 as the time of "authoritarian-corporative finances" in Portugal.

[6] For example, Garrido (2008) considered that, during the *Estado Novo*, there was a "dogmatic proclamation of the principle of healthy finances (…) until the very last days of the regime".

[7] Excerpts from Salazar's speech on 21 October, 1929. See Salazar (1948).

Indeed this principle of sound public finances was actually incorporated in the 1933 Political Constitution of the Portuguese Republic – the legal backbone of the *Estado Novo*. Part I, Title XIV, Article 66 of this fundamental law lays down the obligation for the government budget to provide balance between total revenue and total expenditure (see *Diário do Governo*, 1933).

The question is how the Portuguese public finances behaved in actual practice during the period 1933-1974.

Valério (1994) presents an analysis of the public finances during the period 1914-1947, which includes part of the *Estado Novo* period (1933-1947). However, we have been unable to find any detailed work on this issue in the years from 1948 to 1974.

Consulting the general accounts of the Portuguese state over that sub-period (see Ministério das Finanças, 1948-1976), and combining these figures with the data given by Valério (1994), we can examine all the public budget balances deemed official by the *Estado Novo* for the period 1933-1974.[8] Supplementing these data with those of Pinheiro et al. (1999) and Valério (2008) for GDP,[9] we can calculate the official public budget balances as a percentage of GDP.[10] The result of this exercise is shown in Figure 1.

If we exclude 1974 – the year when the regime was overthrown – there were only fiscal surpluses. This result is consistent with the principle of sound public finances – the very core of the regime's propaganda.

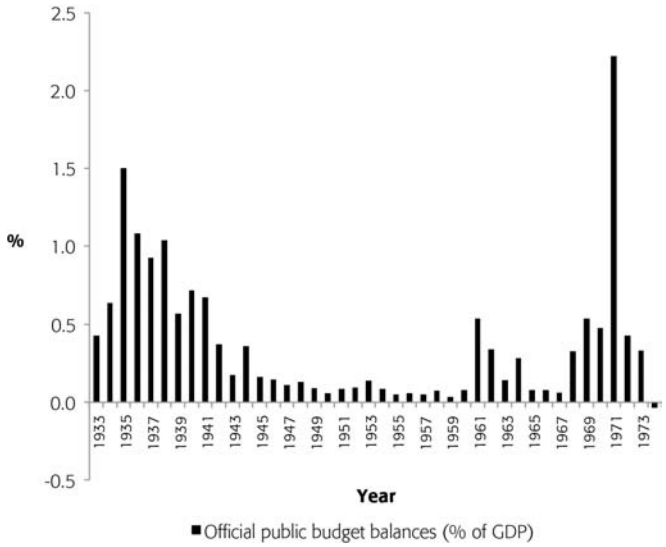
However, using Valério's data, we see that the "official" public

[8] Note that these data are for the central government only, the only entity that was within the "official" perimeter of the public accounts at that time, i.e. the only one that was considered in the State's general accounts.

[9] For 1953-1974, the data were taken from Pinheiro et al. (1999); for 1933-1952, from Valério (2008).

[10] Decree-Law no. 25,299 of 6 May 1935 stipulated that from 1936 onwards the fiscal year would coincide with the calendar year (see *Diário do Governo*, 1935). That is, until 1935 budgets referred to two different calendar years. Here, for simplicity, we have adjusted the budgets to the calendar years. So the budgets for the fiscal years 1932-1933, 1933-1934 and 1934-1935 correspond to 1933, 1934 and 1935 respectively (and, in order to calculate the ratios for those years, we use the GDP of 1933, 1934 and 1935).

FIGURE 1
"Official" public budget balance as a percentage of GDP, 1933-1974



Source: Own calculations using data from Ministério das Finanças (1948-1976), Valério (1994, 2008) and Pinheiro et al. (1999).

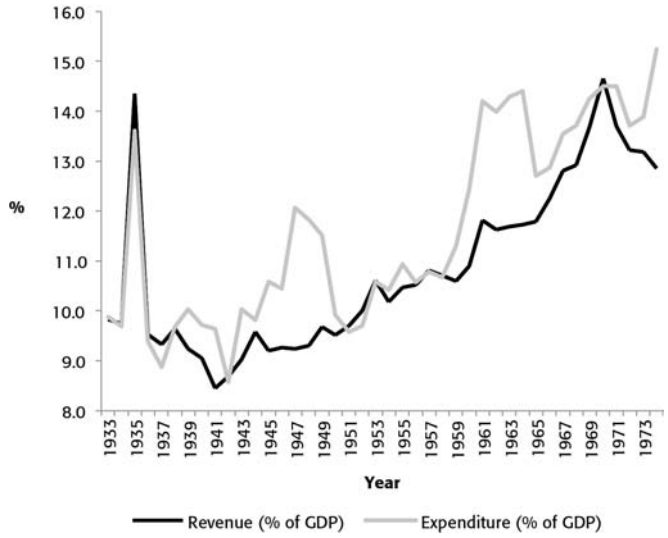
budget balances in the period 1933-1947 contained "non-effective" values, both on the revenue side and on the expenditure side.[11] This means that these official budget balances included values that had no impact on the net public debt (quite different from the current procedures governing the Portuguese public accounts).

Valério (1994) purged the "official" data of these "non-effective" components to construct a new statistical series that includes only "effective" data. We thus have "effective" revenue, "effective" expenditure and the "effective" public budget balance. Using this same fiscal classification, we can also calculate and construct a new series for these variables (based exclusively on "effective" values) for the period 1948-1974.

[11] The author considers as "effective" values those that influence the amount of the net debt; "non-effective" values are those that do not. On the revenue side, "non-effective" values included, for example, some loans and fiscal surpluses from previous years. On the expenditure side, they included debt repayments.

In Figure 2, we illustrate "effective" revenue and "effective" expenditure, both as a percentage of GDP, for the whole of the *Estado Novo* period.

Figure 2
"Effective" public revenue and expenditure as a percentage of GDP, 1933-1974



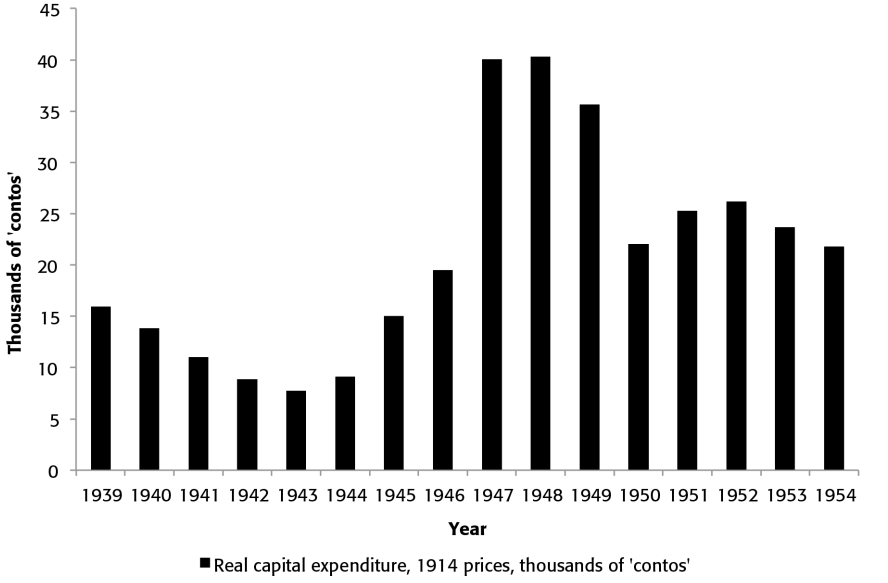
Source: Own calculations using data from Ministério das Finanças (1948-1976), Valério (1994, 2008) and Pinheiro et al. (1999).

Figure 2 shows that "effective" expenditure was sharply higher than "effective" revenue in the years 1947-1949, and again, even more intensively, in 1961-1964. At the end of our period, in 1974, there was also another clear divergence.

All of these facts have a historical explanation. For 1947-1949, it consists mainly in very substantial capital expenditure, particularly investment, i.e. spending for economic development. To better understand this reality, Figure 3 traces the evolution of real capital expenditure from 1939 to 1954.[12]

[12] For the years up to 1947, nominal capital expenditure is taken from Valério (1994). For 1948 and 1949 the values are calculated using data taken directly from the State's general accounts (see Ministério das Finanças, 1949-1959). Finally, in order to calculate the real values, we used the price index (1914 base) from Valério (2008).

FIGURE 3
Real capital expenditure, at 1914 prices,
in thousands of 'contos'[13], 1939-1954



Source: Own calculations using data from Ministério das Finanças (1949,1955), Valério (1994, 2008).

With the end of the Second World War, and after suffering various forms of deprivation, Portugal felt a strong need to industrialise (see, for example, Lains, 2003). The start of this industrial process had significant repercussions on "effective" public expenditure,[14] capital expenditure in particular.[15] After these three years of rapid growth in capital expenditure (1947-1949), on average the variation in this expenditure was more moderate (while nevertheless remaining above its pre-1946 levels).

[13] The *escudo* was the currency of Portugal in the period under analysis. A '*conto*' was a unit of account equal to 1,000 escudos. On 1 January 1999 the escudo was replaced by the euro (1 euro = 200.482 escudos).
[14] This is an interesting point: the "official" public budgets ran surpluses in 1947-1949 because of the large amount of loans ("non-effective values"), which were included in "official" but excluded from "effective" revenue.
[15] However, due to some difficulties in the immediate postwar period, and in order to

Together with industrialisation in the 1950s, the Portuguese economy also underwent progressive integration with the postwar international order, as Portugal joined various institutions and subscribed a number of agreements.[16] The years from the 1950s to the early 1970s would be known as the golden age of the Portuguese economy.[17]

However, these decades not only meant "good news" for Portugal. During this highly favourable macroeconomic conjuncture, the country was involved in military conflict in the colonies which began in 1961.[18] This brought a significant increase in the extraordinary costs of the State for defence and security as early as 1961 – what we might well call a "war shock."[19] Figure 4 shows the evolu-

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finance the start of a major programme of industrialisation (which required, for example, imports of machinery), Portugal needed to resort to the Marshall Plan. The bilateral agreement on economic cooperation with the United States was signed on 28 September 1948. The Marshall Plan was debated in the National Assembly. The speech of the parliamentarian Alberto Henriques Araújo on 14 December 1949 demonstrates the importance that this aid had for the development of the Portuguese economy: "there was no reason for us not to enjoy the advantages it offered. (…) If we had not accepted American aid, then necessarily the currently ongoing economic development plan would have had to be delayed, and this would have happened at a time when all other countries are seeking, through this plan, to create greater economic autonomy." To consult the entire debate, see Secretaria da Assembleia Nacional (1949). For a detailed study about the negotiations that led to Portugal's accession to the Marshall Plan, see Rollo (1994).

[16] Some examples: in 1948 Portugal was a founding member of the Organisation for European Economic Cooperation (OEEC) and a founding member of the European Free Trade Association (EFTA), formed in 1955. Also in 1955, Portugal became a full member of the United Nations (UN). In 1960, it subscribed the General Agreement on Tariffs and Trade (GATT), and in 1961, it also became a member of the International Monetary Fund (IMF) and the World Bank.

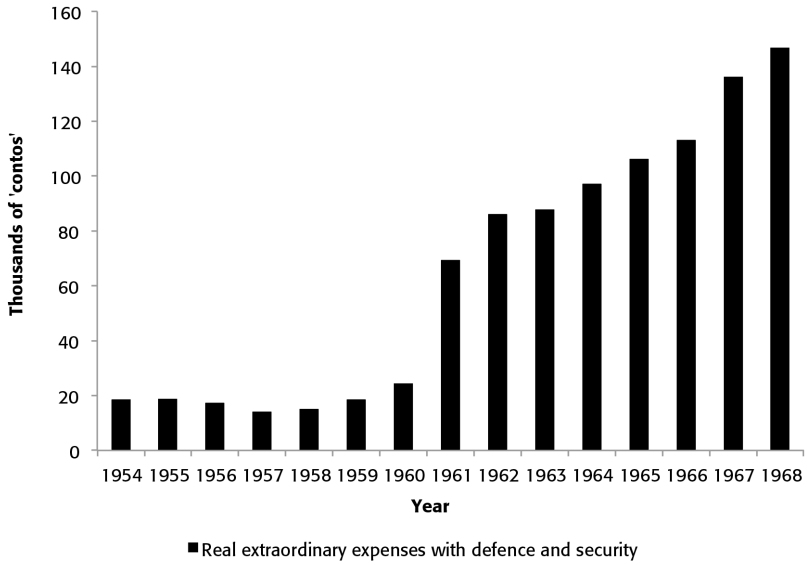
[17] This was the golden period for the world economy. For more on this, see, for example, Eichengreen (1994), Maddison (1995) and Temin (2002).

[18] Independence movements launched their first organised attacks in Luanda, Angola, on 4 February 1961, leading to the outbreak of violent conflicts in several areas and the beginning of the Portuguese Colonial War. The conflict in Angola spread to Guinea and Mozambique, where other revolutionary movements sought independence. In response, Portugal sent military and non-military contingents (police) to the conflict zones both to ensure the protection of the population and to maintain control of the territories.

[19] The State's general accounts made a distinction between ordinary expenses (those which by their nature are repeated from one year to the next) and extraordinary expenses.

tion of these extraordinary expenses in real terms for the period 1954-1970.[20]

FIGURE 4
Real extraordinary expenditure for defence and security, at 1914 prices, in thousands of 'contos', 1954-1968



Source: Own calculations using data from Ministério das Finanças (1955-1969) and Valério (2008).

As Figure 4 shows, after the surge in 1961 these expenses remained at a much higher level than in the period prior to the Portuguese Colonial War. To defray this most significant increase in expenditure, the Portuguese state took out a larger volume of loans in 1961-1964.[21] In

[20] The figures on nominal expenditure for economic development and for defence and security are taken directly from the State's general accounts (see Ministério das Finanças, 1955-1965). To calculate expenditure in real terms, we used the price index (1914 base) from Valério (2008).

[21] The reason for the budget surpluses recorded in the period 1961-1964 was, once again, the substantial amount of loans classed as "official" revenue (but not "effective" revenue). Furthermore, a special tax was also instituted, the "Imposto para a Defesa e Valorização do Ultramar" (Tax for the Defence and Development of the Overseas Colonies). This tax on the profits of certain commercial and industrial activities went into effect in 1962. See *Diário do Governo* (1961).

the years that followed, however, the volume of borrowing diminished, while tax revenue increased significantly thanks to the very favourable economic environment and the imposition of new taxes.[22]

Finally, the gap between "effective" revenue and "effective" expenditure widened in 1974, the year when the *Estado Novo* was overthrown and also when the effects of the first international oil shock were felt. The sharp rise in nominal GDP (in a high-inflation environment) dictated the decline in the ratio to GDP of "effective" revenue but not of expenditure, which rose rapidly in nominal terms. In the State's general accounts (see Ministério das Finanças, 1976), we find the main explanations: "measures taken to improve the salaries of public workers, in particular through Decree-Law 372/74, of 20 August" and high "expenditure on the implementation of the Development Plan" were responsible for the large increase in expenditure in that year.[23]

Finally, the difference between "effective revenue" and "effective expenditure" (see again Figure 2) gives the "effective" public budget balance, which had an impact on the public debt. Figure 5 shows this balance as a percentage of GDP, as well as the debt/GDP ratio, for the period under study.[24]

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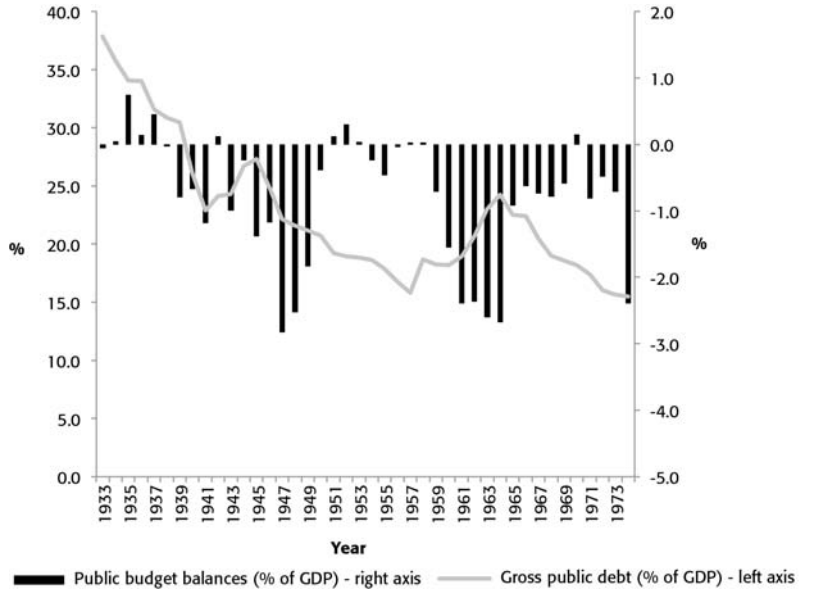
[22] Examining the State's General Accounts for 1965 we can see that the fiscal revenue from imports (the most important tax at that time) increased by 30% in nominal terms that year, when imports grew by 19% in nominal terms, one of the highest rates on record between 1933 and 1974 (see data from Pinheiro et al., 1999). There were some legislative changes to the import tariff schedule in 1965 (see, for example, *Diário do Governo*, 1965). The next year, 1966, saw the enactment of the "Imposto sobre transacções" (Transaction tax), which was levied on the sale and exchange of goods, services and financial assets (for more details about this tax, see *Diário do Governo*, 1966).

[23] Decree-Law no. 372/74 of 20 August 1974 provided for a significant increase in the monthly salaries of public employees. It also established the legal obligation to pay a thirteenth month of salary (Christmas bonus), and a holiday bonus that was equivalent to half of the monthly remuneration. See *Diário do Governo* (1974).

[24] Until 1947, the values for the public budget balance are taken from Valério (1994). The public budget balance from 1948 to 1974 is calculated on data taken directly from the State's general accounts (see Ministério das Finanças, 1949-1976), using the methodology developed by Valério (1994). The values of the public debt for the whole period (1933-1974) are taken from Valério (2001). The nominal GDP is from Pinheiro et al. (1999) and Valério (2008).

FIGURE 5
"Effective" public budget balance and debt
as a percentage of GDP, 1933-1974



Source: Own calculations using data from Ministério das Finanças (1948-1976), Valério (1994, 2001, 2008) and Pinheiro et al. (1999).

The figure shows the predominance of "effective" deficits over surpluses in the *Estado Novo*'s finances (by over a 3-to-1 ratio). Not surprisingly, for the reasons given above, the largest "effective" deficits came in 1947-1949, 1961-1964 and 1974. However, the deficit never exceeded 3% of GDP, and the ratio of debt to GDP recorded its all-time low in the last year of the period, at 15.5%.[25] This reflects above all the strong growth of GDP in nominal terms, since nominal public debt grew in most years during this period.[26]

[25] Interestingly, under the European Union's fiscal rules a country's public finances can be considered sound and sustainable if the deficit does not exceed 3% of GDP and the debt does not exceed 60% (two of the five convergence criteria, known as the "Maastricht criteria"). As we see, in the period of the *Estado Novo*, Portugal always met these standards.

[26] During this period, GDP grew at an average rate of 7.7% per year in nominal terms and 3.8% in real terms (own calculations based on Pinheiro et al, 1999 and Valério, 2008).

The question is whether the behaviour of these variables means that Portuguese fiscal policy was sustainable during the *Estado Novo* period. How can we assess this?

3. The theoretical framework: sustainable fiscal policy

A sustainable fiscal policy can also be presented in algebraic terms. To do so, we focus on the designated government budget constraints that can be displayed in real terms, as follows:[27]

$$B_t - B_{t-1} = r_t \cdot B_{t-1} + G_t - R_t \quad (1)$$

where:[28]

G_t is the primary expenditure (i.e. net of interest payments) in period t;

R_t is revenue in period t;

r_t is the real interest rate in period t paid to public debt holders;

B_t and B^{t-1} are the public debt in period t and in period $t-1$.

The equation can also be written as follows:

$$B_t = (1 + r_t) \cdot B_{t-1} + G_t - R_t \quad (2)$$

By a series of algebraic transformations, one can deduce the government budget constraint for successive periods, resulting in the so-called intertemporal budget constraint. Assuming a constant real interest rate (r), and making some changes, we obtain:

$$G_t + (1 + rt) \cdot B_{t-1} - r \cdot B_{t-1} = R_t + B_t - r \cdot B_{t-1} \quad (3)$$

Considering E_t as the primary expenditure in period t plus real interest payments (with interest rate of around r), we have:

$$E_t = G_t + (r_t - r) \cdot B_{t-1} \quad (4)$$

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[27] For a much more detailed algebraic development, see, for example, Pereira et al. (2005).

[28] However, there are other factors not in the equation 1 (and outside the public budget) that can cause variations in the public debt. To simplify the process, these factors are usually assumed to be zero (see, for example, European Central Bank, 2011).

$$\Leftrightarrow E_t + (1 + r) \cdot B_{t-1} = R_t + B_t \tag{5}$$

From this last equation, and proceeding to a series of successive recursive substitutions, we obtain the designated intertemporal budget constraint:

$$B_{t-1} = \sum_{S=0}^{\infty} \frac{1}{(1+r)^{S+1}} \cdot (R_{t+S} - E_{t+S}) + \lim_{S\to\infty} \frac{B_{t+S}}{(1+r)^{S+1}} \tag{6}$$

Hence, a sustainable fiscal policy would have to satisfy the following condition:

$$\lim_{S\to\infty} \frac{B_{t+S}}{(1+r)^{S+1}} = 0 \tag{7}$$

That is, sustainable fiscal policy must ensure that the variation in the public debt tends towards zero. In other words, the public debt cannot increase indefinitely at a higher rate than the real interest rate (a requirement also known as the "no-Ponzi-scheme" condition).

In addition, this means that there must be future real primary balances equal in value to the real debt stock in the initial period:

$$B_{t-1} = \sum_{S=0}^{\infty} \frac{B_{t+S}}{(1+r)^{S+1}} \cdot (R_{t+S} - E_{t+S}) \tag{8}$$

There are empirical procedures for the validation of these conditions.

One such procedure is that suggested by Trehan and Walsh (1991).[29] This means testing for the stationarity of the public debt: if the public debt is a stationary series in levels, I (0), or, in first differences, I (1), then the condition given by equation (7) will be satisfied. The latter case is conceptually equivalent to having a stationary public budget balance. Trehan and Walsh accordingly considered that in a context in which the expected real interest rate is constant, the station-

[29] Earlier studies testing budget constraints include Hamilton and Flavin (1986), Trehan and Walsh (1988), Wilcox (1989) and Hansen et al. (1991).

arity of the public budget balance, I(0), is "necessary and sufficient" for the sustainability of fiscal policy when the public debt is I(1).

Another procedure, that of Hakkio and Rush (1991), involves testing public revenue and expenditure. Given that the intertemporal budget constraint can also be written for the variables in first differences, we have:

$$\Delta B_t = \sum_{S=0}^{\infty} \frac{1}{(1+r)^{S+1}} \cdot (\Delta R_{t+S} - \Delta E_{t+S}) + \lim_{S\to\infty} \frac{B_{t+S}}{(1+r)^{S+1}} \qquad (9)$$

considering that $\Delta B_t = GG_t - R_t$, so that, after applying the "no-Ponzi-scheme" condition, we will have the alternative equation:

$$GG_t - R_t = \sum_{S=0}^{\infty} \frac{1}{(1+r)^{S+1}} \cdot (\Delta R_{t+S} - \Delta E_{t+S}) \; . \qquad (10)$$

Assuming that R and E are non-stationary variables, but that their first differences are stationary, the left-hand side of the equation must also be stationary.

The Hakkio and Rush procedure thus entails testing for cointegration between government revenue (R) and public expenditure plus interest (GG). This means testing the cointegration regression, $R_t = \alpha + \beta.GG_t + u_t$, with the following two options: 1) the null hypothesis, namely that GG_t and R_t, both integrated of order 1, I(1), are not cointegrated, and 2) the alternative hypothesis, that GG_t and R_t, both integrated of order 1, I(1), are cointegrated. Note that in testing these variables Hakkio and Rush found it more appropriate to use ratios for growing economies.

According to Hakkio and Rush (1991), then, "GG and R cointegrated" is a necessary condition for the sustainability of fiscal policy[30] – which is conceptually equivalent to having a stationary public budget balance.

In summary, sustainable fiscal policy (or sustainable public fi-

[30] The authors observe that if $\hat{\beta} = 1$, the adjustment between expenditure and revenue will be complete. However, if $\hat{\beta} < 1$ the government may face "increasing difficulty in marketing its debt" in the future. So they considered cointegration a necessary condition and $\hat{\beta} = 1$ "probably a necessary condition".

nances) requires stationarity of the public budget balance and a stationary first difference of public debt (which is a necessary and sufficient condition) or the cointegration of revenue and expenditure (a necessary condition).[31]

4. Empirical results

Since ratios are more appropriate than absolute values for analysing growing economies (like Portugal during the period of the *Estado Novo*), we have chosen the following variables: debt/GDP ratio (b_t), and public expenditure (gg_t), revenue (ρ_t) and the budget balance (s_t), all as percentages of GDP.[32] We ran a series of standard tests for the stationarity of these variables:[33] the ADF (Dickey and Fuller, 1979) and the ADF-GLS (Elliot et al., 1996), which take as their null hypothesis (h_0) that there is a unit root; and KPSS (see Kwiatkowski et al., 1992), which takes as its null hypothesis (h_0) that there is stationarity. We present the results of each test, and the overall result, in Table 1.

TABLE 1
Results of the ADF, ADF-GLS and KPSS tests

Variable	ADF	ADF-GLS	KPSS	Overall result
b_t	I(I)	I(0)	I(1)	I(1)
ρ_t	I(1)	I(1)	Trend stationary	I(1)
gg_t	I(1)	I(1)	Trend stationary	I(1)
s_t	I(1)	I(0)	I(0)	I(0)

Note 1: The tests were performed with constant and trend, as well as with constant and no trend.
Note 2: For more details, see Tables A1, A2 and A3 in the Appendix.

[31] For example, Quintos (1995) considered that a "strong" requirement for "deficit sustainability" is "that the debt process should be stationary", or "alternatively (…) that revenue and expenditure should be cointegrated".
[32] All these variables are limited to their "effective" components. In other words, we measure "effective" revenue as a percentage of GDP (including seignioriage), "effective" expenditure as a percentage of GDP, and the "effective" budget balance as a percentage of GDP (for more information about these variables, see Section 2).
[33] Prior to conducting these tests, it is customary to analyse the behaviour of the variables graphically. Figures 2 and 5 above suggest that, with the possible exception of the budget balance, none of the variables is stationary in levels, I(0).

The intersection of the results obtained shows a stationary public budget balance as a percentage of GDP and a debt/ GDP ratio that is stationary in first differences.[34] In the terms of Trehan and Walsh (1991), this satisfies the "necessary and sufficient" condition for the sustainability of fiscal policy. This means, in short, that during the period of the *Estado Novo*, 1933-1974, Portuguese fiscal policy was sustainable.

It is still possible to conclude that the series of public revenue and public expenditure are I (1).[35] Therefore, we also considered whether these two variables are cointegrated; Table 2 gives the results of the test of Engle and Granger (1987).

Table 2
Engle-Granger test between revenue and expenditure as a percentage of GDP

Cointegration relationship by OLS regression			
	β		0.75
	P-Value		0.00 ***
Results of ADF, ADF-GLS and KPSS tests for $\hat{u}_t$			
ADF	ADF-GLS	KPSS	Overall result
I(1)	I(0)	I(0)	I(0)

Source: Own calculations using Gretl Software (2014).
Note 1: *, ** and *** represent statistical significance of the regressor at the 10%, 5% and 1% levels, respectively.
Note 2: For more details on the stationarity tests for $\hat{u}_t$, see Table A4 in the Appendix.

Given that the coefficient β estimated in the cointegration regression is statistically significant and also that the residuals are stationary in terms of levels,[36] these results imply the presence of cointegration between the revenue and expenditure ratios.

[34] In the case of the "effective" budget balance, only the ADF test produces a different result. For the debt/GDP ratio, only the ADF-GLS test produces a different result.
[35] In the case of revenue and expenditure, only the KPSS test produces a different result.
[36] Only the ADF test result shows non-stationarity.

In order to obtain more robust results, we also ran the Johansen trace and maximum eigenvalue tests for cointegration (1988, 1991); see Table 3 below.

TABLE 3
Johansen tests between revenue and expenditure as a percentage of GDP

Lags	Rank	Trace			λ max		
		h_0	h_1	P-Value	h_0	h_1	P-Value
3	0	$r = 0$	$r > 0$	0.02**	$r = 0$	$r = 1$	0.01***
	1	$r \leq 1$	$r > 1$	0.98	$r = 1$	$r = 2$	0.98
		β			0.91		

Source: Own calculations using Gretl Software (2014).

Note 1: r is the number of the cointegration vectors. *, ** and *** denote rejection of the null hypothesis (h_0) at the 10%, 5% and 1% levels. The P-values were computed using the gamma-distribution approximation of Doornik (1998).

Note 2: The tests were performed with constant and no trend. The actual lag was chosen in order to optimise the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC) and the Hannan-Quinn Information Criterion (HQC).

As we see, both Johansen tests show cointegration between "effective" revenue and "effective" expenditure as a percentage of GDP – with only one cointegration vector. This corroborates the Engle-Granger test results. Thus Hakkio and Rush's "necessary condition" for the sustainability of the fiscal policy is also satisfied.[37]

Additionally, cointegration can be tested by identifying structural changes in the cointegrating vector. One of the most widely used approaches is that proposed by Gregory and Hansen (1996a, 1996b), whose methodology introduced a residual-based technique to test the null hypothesis of no cointegration against the alternative of cointegration in the presence of a possible unknown break in the time horizon.

The cointegration regression may or may not have a trend; and it may have a break either in the intercept only or in all coefficients. The break point is determined by finding the minimum value for

[37] It is worth underscoring that the Johansen test shows a value of $\hat{\beta}$ very close to 1 (0.91).

the ADF statistics in the residuals from the broken cointegration.[38] In Gregory and Hansen (1996a, 1996b), we find four alternative models:

1) level shift (C) – the model includes a constant and admits a possible unknown break in the intercept;
2) level shift with trend (C/T) – the model includes a constant and trend, and admits a possible unknown break in the intercept;
3) regime shift (C/S) – the model includes a constant and admits a possible unknown break in all coefficients/full break;
4) regime and trend shift (C/S/T) – the model includes a constant and trend, and admits a possible unknown break in all coefficients/full break.[39]

Accordingly, we ran all of Gregory and Hansen's cointegration tests for the period 1933-1974. Additionally, we ran the same tests for the sub-period 1933-1960 to determine whether excluding the colonial war sub-period (1961-1974) alters the conclusions.[40] These results are presented in Table 4.

The results of the Gregory-Hansen tests indicate that, in the presence of an unknown structural break, cointegration between revenue and expenditure is obtained only in the sub-period of peace, 1933-1960. The null hypothesis of "no cointegration" is rejected in the models with a trend for this sub-period. However the "no cointegration" hypothesis is not rejected for the entire period 1933-1974.

In other words, cointegration is robust to structural breaks only if we exclude the Portuguese Colonial War sub-period, 1961-1974, from the overall *Estado Novo* period. This would appear to suggest that the onset of the colonial war in 1961 may have represented a changeover to unsustainable fiscal policy.

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[38] A modified ADF statistic – ADF* – is computed to allow for a regime change in the intercept or in all coefficients (full break).

[39] For more details on these models, see Gregory and Hansen (1996a, 1996b). See also Estima (2015) for a brief explanation of these tests in the context of the Winrats econometric software.

[40] There was a significant increase in the extraordinary costs of the State for defence and security as early as 1961 – the war shock (see Figure 3).

TABLE 4
Gregory-Hansen ADF* tests for cointegration between revenue and expenditure as a percentage of GDP with structural breaks

Level Shift (C)							
Period 1933-1974	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1965	0	-3.64	-4.34	-4.61	-5.13	No cointegration
Level Shift (C)							
Sub-period 1933-1960	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1937	0	-3.15	-4.34	-4.61	-5.13	No cointegration
Level shift with trend (C/T)							
Period 1933-1974	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1939	0	-4.41	-4.72	-4.99	-5.45	No cointegration
Level shift with trend (C/T)							
Sub-period 1933-1960	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1950	0	-5.08**	-4.72	-4.99	-5.45	Cointegration
Regime shift (C/S)							
Period 1933-1974	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1965	0	-3.65	-4.68	-4.95	-5.47	No cointegration
Regime shift (C/S)							
Sub-period 1933-1960	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1951	0	-3.06	-4.68	-4.95	-5.47	No cointegration
Regime and trend shift (C/S/T)							
Period 1933-1974	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1947	0	-4.78	-5.24	-5.50	-6.02	No cointegration
Regime and trend shift (C/S/T)							
Sub-period 1933-1960	Break Year	Lags	Test Statistic	Critical Values 10%	5%	1%	Result
	1945	0	-6.62***	-5.24	-5.50	-6.02	Cointegration

Source: Own calculations using Winrats Software (2015).

Note 1: The critical values are from Gregory and Hansen (1996a, 1996b).
Note 2: The actual lag was selected using general-to-specific pruning t-tests.
Note 3: *, **, and *** denote rejection of the null hypothesis (h_0) of no cointegration at the 10%, 5% and 1% levels.

5. Comparison with other research

The study whose results are most nearly comparable to those obtained here is Marinheiro (2006). That paper tested the sustainability of Portuguese fiscal policy on a long dataset, with a full century of observations. Using stationary tests, standard cointegration tests and cointegration tests with structural breaks, the author concludes that Portuguese fiscal policy was sustainable over the entire time horizon 1903-2003.

In our own research, using similar tests, we found that fiscal policy was sustainable over a shorter period, namely 1933-1974, corresponding exclusively and specifically to the *Estado Novo* dictatorship.[41] As our period is included within Marinheiro's longer one (1903-2003), our conclusion of sustainability is not incompatible with his but instead complements and reinforces it.[42]

Additionally, Marinheiro (2006) concluded that the overall sustainability for 1903-2003 was not maintained for the more recent period of democracy, 1975-2003, taken separately,[43] observing that "this latter period appears to signal a shift to an unsustainable path in Portuguese fiscal policy."

However, our own research seems to suggest that the shift to unsustainability may actually have come years earlier, during the *Estado Novo* period, and specifically with the outbreak of the colonial wars in 1961.

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[41] Like Marinheiro (2006), we conclude that the "necessary and sufficient" condition of Trehan and Walsh (1991) for the existence of a sustainable fiscal policy in the *Estado Novo* period is satisfied. And the standard cointegration tests show satisfaction also of the "sufficient condition" of Hakkio and Rush (1991). We consider that this is convincing evidence of sustainability.

[42] This is an interesting point: in standard cointegration tests, Marinheiro (2006) found a $\hat{\beta}$ equal to 0.71 in the Engle-Granger test, and 0.87 in the Johansen test. Our results are not very different, despite the fact that our coefficients of cointegration are closer to 1: we found a $\hat{\beta}$ equal to 0.75 in Engle-Granger and 0.91 in Johansen.

[43] Afonso (2004) too concluded that Portuguese fiscal policy was not sustainable in the democratic period.

6. Conclusion

Our main conclusion is that under the *Estado Novo* regime from 1933 to 1974, which authoritatively defended the principle of sound public finances, Portuguese fiscal policy was in fact sustainable.

The results include the stationarity of the public budget balance as a percentage of GDP and of the first difference of the debt/GDP ratio – satisfying the "necessary and sufficient" condition for sustainability established by Trehan and Walsh (1991). Furthermore, according to the standard tests, revenue and expenditure (in proportion to GDP) are cointegrated – a "necessary condition" for sustainability according to Hakkio and Rush (1991). However, the cointegration between these two variables is robust to structural breaks only if the era of colonial warfare (1961-1974) is excluded from the sample period.

Thus, first of all, the results provide sufficient evidence of fiscal sustainability over the *Estado Novo* period, 1933-1974, as a whole. Secondly, however, they also suggest that the beginning of colonial warfare may have marked a transition to unsustainable fiscal policy. This interesting finding – the possible fiscal policy shift in 1961 – can be subjected to additional tests in future research, with a view to possible stronger confirmation.

We believe that this study represents a relevant contribution to the literature on the *Estado Novo*, and in particular its public finances. And we hope it may generate an important discussion that will be of benefit for future research.

Appendix

Table A1
ADF Results

Test with constant and without trend			
Variable	Lags	P-Value	Result
b_t	1	0.21	Non-stationary
ρ_t	2	0.90	Non-stationary
gg_t	3	0.89	Non-stationary
s_t	1	0.16	Non-stationary
Test with constant and trend			
Variable	Lags	P-Value	Result
b_t	2	0.47	Non-stationary
ρ_t	1	0.31	Non-stationary
gg_t	1	0.16	Non-stationary
s_t	1	0.33	Non-stationary
Test with constant and without trend			
Variable	Lags	P-Value	Result
b_t	1	0.00***	Stationary
ρ_t	2	0.00***	Stationary
gg_t	1	0.00***	Stationary
s_t	1	0.01***	Stationary

Source: Own calculations using Gretl Software (2014).

Note 1: *, ** and *** denote rejection of the null hypothesis (h_0) of a unit root at the 10%, 5% and 1% levels.

Note 2: The maximum lag was chosen using the rule provided by Schwert (1989). The actual lag was obtained by testing down in order to optimise the Akaike Information Criterion (AIC).

Note 3: P-Values are based on MacKinnon (1996).

TABLE A2
ADF-GLS Results

Test with constant and without trend						
Variable	Lags			P-Value		Result
b_t	1			0.02**		**Stationary**
ρ_t	1			0.24		Non-stationary
gg_t	1			0.30		Non-stationary
s_t	1			0.02**		**Stationary**
Test with constant and with trend						
Variable	Lags	Test Statistic	Critical Values			Result
			10%	5%	1%	
ρ_t	1	-2.40	-2.89	-3.19	-3.77	Non-stationary
gg_t	1	-2.87	-2.89	-3.19	-3.77	Non-stationary
Test with constant and without trend						
Variable	Lags			P-Value		Result
ρ_t	3			0.00***		**Stationary**
gg_t	1			0.00***		**Stationary**

Source: Own calculations using Gretl Software (2014).

Note 1: As for Table 1.
Note 2: As for Table 1.
Note 3: As for Table 3.
Note 4: In the case of the tests with linear trend, the critical values are taken from Elliot et al. (1996).

TABLE A3
KPSS Results

Test with constant and without trend						
Variable	Lags	Test Statistic	Critical Values			Result
			10%	5%	1%	
b_t	3	0.83***	0.35	0.47	0.72	Non-stationary
ρ_t	3	0.85***	0.35	0.47	0.72	Non-stationary
gg_t	3	0.93***	0.35	0.47	0.72	Non-stationary
s_t	3	0,20	0.35	0.47	0.72	**Stationary**
Test with constant and with trend						
Variable	Lags	Test Statistic	Critical Values			Result
			10%	5%	1%	
b_t	3	0.22***	0.12	0.14	0.21	Non-stationary
ρ_t	3	0.20**	0.12	0.14	0.21	**Trend-Stationary**
gg_t	3	0.14*	0.12	0.14	0.21	**Trend-Stationary**
Test with constant and without trend						
Variable	Lags	Test Statistic	Critical Values			Result
			10%	5%	1%	
Δb_t	3	0.26	0.35	0.47	0.72	**Stationary**

Source: As for Table A1.

Note 1: *, ** and *** denote rejection of the null hypothesis (h_0) of stationarity at the 10%, 5% and 1% levels.

Note 2: The actual lag was chosen using the rule provided by Schwert (1989).

Note 3: The critical values shown for the tests are based on the response surfaces estimated by Sephton (1995).

TABLE A4
ADF, ADF-GLS and KPSS Tests Results

ADF Test			
Test with constant and without trend			
Variable	Lags	P-Value	Result
$\hat{u}_t$	1	0.167	Non-stationary
ADF-GLS Test			
Test with constant and without trend			
Variable	Lags	P-Value	Result
$\hat{u}_t$	1	0.02**	Stationary
KPSS Test			
Test with constant and without trend			

Variable	Lags	Test Statistic	Critical Values			Result
			10%	5%	1%	
$\hat{u}_t$	3	0.11	0.35	0.47	0.72	Stationary

Source: As for Table A1.

Note 1: For ADF and ADF-GLS, *, ** and *** denote rejection of the null hypothesis (h_0) of a unit root at the 10%, 5% and 1% levels. For KPSS, *, ** and *** denote rejection of the null hypothesis (h_0) of stationarity at the 10%, 5% and 1% levels.

Note 2: For ADF and ADF-GLS, the maximum lag was chosen using the rule provided by Schwert (1989) and the actual lag was obtained by testing down in order to optimise the Akaike Information Criterion (AIC). For KPSS, the actual lag was chosen using the rule provided by Schwert (1989).

Note 3: P-Values for ADF and ADF-GLS are based on MacKinnon (1996).

Note 4: The critical values shown for the KPSS tests are based on the response surfaces estimated by Sephton (1995).

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