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Fiscal cyclicality, war and bankruptcies in Greece, 1833-1939

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Fiscal cyclicality, war and bankruptcies in Greece, 1833-1939•

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Abstract

Using a novel historical dataset of Greek public finances from 1833 to 1939, we investigate the cyclical behavior of public spending, tax buoyancy, and the impact of political transformations, wars and bankruptcies in Greece. Our findings indicate that territorial expansions increased public spending cyclicality, resulting in a deficit and debt bias. Tax buoyancy declined until the early 20th century but improved from the 1920s onward. Poor initial fiscal conditions and enhanced democratic quality mitigate pro-cyclical spending and boost tax revenue buoyancy. Both war and bankruptcy episodes significantly elevated the debt-service to-GDP ratio and reduced economic activity in the medium-term.

JEL: H20; H56; H60; O23; N40

Keywords: Fiscal policy, Cyclicality, War, Bankruptcies, Greece

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Δημοσιονομική κυκλικότητα, πόλεμοι και πτωχεύσεις στην Ελλάδα, 1833-1939

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Περίληψη

Χρησιμοποιώντας ένα νέο ιστορικό σύνολο δεδομένων για τα δημόσια οικονομικά της Ελλάδας για την περίοδο 1833-1939, διερευνούμε την κυκλική συμπεριφορά των δημόσιων δαπανών, τη φορολογική ευρωστία και την επίδραση των πολιτικών μετασχηματισμών, των πολέμων και των πτωχεύσεων. Τα ευρήματά μας δείχνουν ότι οι εδαφικές επεκτάσεις (δεδομένης της έλλειψης αποτελεσματικού μηχανισμού ελέγχου και επιτήρησης των δαπανών) αύξησαν την κυκλικότητα των δημόσιων δαπανών, οδηγώντας σε μεροληψία χρέους και ελλείματος. Η φορολογική ευρωστία παρουσίασε πτωτική πορεία μέχρι τις αρχές του 20ου αιώνα, αλλά βελτιώθηκε μετά τη δεκαετία του 1920. Οι αρχικά δυσμενείς δημοσιονομικές συνθήκες και η βελτίωση της ποιότητας των δημοκρατικών θεσμών μετριάζουν την φιλοκυκλική συμπεριφορά των δαπανών και ενισχύουν την ευρωστία των φορολογικών εσόδων. Οι πολεμικές συγκρούσεις και οι πτωχεύσεις αύξησαν σημαντικά το λόγο εξυπηρέτησης του χρέους προς το ΑΕΠ και επηρέασαν αρνητικά την οικονομική δραστηριότητα μεσοπρόθεσμα.

Λέξεις κλειδιά: Δημοσιονομική πολιτική, Κυκλικότητα, Πόλεμος, Χρεοκοπίες, Ελλάδα

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1 Introduction

Countercyclical fiscal policy, broadly defined as the negative relationship between the phase of the economic cycle and the fiscal deficit (or its components) is largely viewed as a measure of fiscal prudence. Prudent governments should take advantage of periods of rising economic activity to improve their budget balance in order to be in a better position to intervene through budget deficits during an economic downturn. The call for fiscal prudence became rather urgent in the aftermath of the 2008 financial meltdown and the associated debt crises in the EU. The European Commission has gone a longer way than anyone to institutionalize counter-cyclical policies as official and measurable fiscal policy rules.

The idea of saving in the good times to provide for the bad times is simple, and quite old at that, but while solid in theory it is far from universal in practice. A series of empirical works (Gavin and Perotti, 1997; Talvi and Vegh, 2000; Kaminski et al., 2004; Alesina and Tabellini, 2005; Frankel et al., 2013; Ilzetki et al., 2013; Vegh and Vuletin, 2015) compared fiscal policy indicators in developing and advanced economies finding that the former followed a much more pro-cyclical pattern than the latter. The divergence has been explained by economic and political factors. Developing countries facing higher volatility in the tax base and the associated revenue may opt to limit budget surpluses to avoid wasteful spending (Talvi and Vegh, 2000). Credit constraints limit developing countries' access to borrowing – even more so during economic downturns – and compel them to implement contractionary fiscal policies during recessions (Gavin and Perotti, 1997). Political economy factors would also appear to be important, since revenue windfalls during an upswing could encourage different government departments to claim larger budgets for themselves (Tornell and Lane, 1998) or voters may resist contractionary policies in good times to the extent that they

perceive governments as political rent-seekers (Alesina and Tabellini, 2005). Frankel et al. (2013) found that some developing countries have changed their fiscal stance from pro- to countercyclical since 2000. Their empirical investigation generally confirms the importance of the above-mentioned economic and political factors, but they mostly attribute this change to institutional improvement (graduation). These explanations are not mutually exclusive. In fact, the credit constraints explanation fits better to the downward phase of the cycle (Gavin and Perotti, 1997), while the tax base variability and the political economy explanations to the upward phase of the cycle (Alesina et al., 2008).

It is evident that academic research on cyclicality covers a large sample of countries but is limited to the experiences of late 20th century. Perhaps this absence of historical perspective is to be expected and justified by the relative scarcity of reliable and detailed fiscal data going back in time. Despite Persson's (1997) plea that 'It would indeed be interesting to go back to more volatile historical periods – such as the interwar period – and look for signs of procyclical fiscal policy in the industrialized countries', there has not been, to the best of our knowledge, any attempt to measure fiscal policy cyclicality from a historical point of view.

We shall argue that exploring the cyclical behavior of a country back in the 19th and early 20th century can be a fruitful endeavor. To begin with, we can put to the test some of the original interpretations for cyclicality, such as the importance of volatility, credit constraints and political institutions. Defaults, for example, can provide a distinct point of view at credit constraints, whereas the introduction of democracy can shed some light onto the relevance of voter pressures and institutional improvements. Moreover, we can raise some new questions and discuss the role of other potential factors, such as wars and territorial expansions. Given that such events occurred far more often in the

past than today, especially in advanced economies, history may teach us a few things about their implications for fiscal cyclicality. More broadly, we can gain some insight for the long-run determinants of fiscal prudence. Pro- or countercyclicality is not a permanent feature of any economy and may change over time.

This paper studies the fiscal policy of Greece from 1833 until the outbreak of the Second World War in 1939. During this long period, Greece experienced a turbulent history with major political transformations, territorial expansions, wars and defaults that would have presumably affected fiscal performance. Our primary purpose is to shed light on how policymakers managed fiscal policy in such an unstable environment. This context is significant given that Greece required substantial loans from allied powers for its reconstruction, leading to three defaults during the examined period as well as subsequent wars. Hence, this paper is interesting for policymaking purposes, since Greece's history is a story of debt, default, and external dependency. According to Stavrianos (1952), the Greek people have been burdened with an overwhelming foreign debt that has essentially drained their lifeblood. The above-mentioned statement could have been written in 2010, when Greece was once again in the midst of a severe public debt crisis, necessitating stringent measures and fiscal adjustments to prevent an uncontrolled default.

The paper's contribution spans multiple dimensions. First, it exploits a new detailed historical dataset for Greek public finances compiled by Koutentakis (2023), meticulously assembled from official documents, spanning slightly more than a century of the Greek state's existence. While his own research focuses on the historical development of fiscal capacity, our purpose here is to exploit the dataset further and examine the performance of more elaborate measures of fiscal policy, other than the traditional discussion on fiscal capacity. Second, building on this new dataset we

estimate the cyclicality of government spending and the tax revenue buoyancy by means of the Varying Coefficient method developed by Schlicht (2003). In addition, we examine the relevance of various economic and political factors which could impact fiscal policy and the cyclical behavior of government spending and revenue. Third, building on Jorda (2005) local projection methodology and the available information we investigate the short- to medium-term effects of both war and default-induced shocks on fiscal policy and economic activity. Fourthly, focusing on the cyclical behavior of Greece in the 19th century and the early 20th century can provide an opportunity to test original ideas regarding cyclicality and to draw conclusions relevant to the exercise of fiscal policy in the present. This includes considerations such as credit constraints (as proxied by bankruptcy episodes) and pressures exerted by voters and institutional improvements (as proxied by the introduction of democracy).

We find that primary spending is procyclical which is primarily due to the military spending and to a lesser extent to civilian spending, contributing to the overheating of the economy and a deficit bias. The estimated tax revenue buoyancy remains above 1 over the whole sample, suggesting that the tax system could generate proportionally more revenue than a given increase in economic activity. This finding seems to explain the overall balanced primary budget throughout the period (Koutentakis, 2023). The Greek economy produced enough tax revenue to finance the military adventures that eventually paid-off.

Turning to the determinants of fiscal cyclicality, we find that an increase in debt service increases the tax buoyancy of total taxes and direct taxes, while induces a negative effect on the government spending cyclicality. The finding suggests that rising public debt operated as a fiscal discipline device. Next, territorial expansion and population growth raised the procyclical response of public spending while, on the government

revenue side, contributed to an increase in total revenue. This latter effect is interesting as territory and population growth could have affected public revenue in opposite directions. On the one hand, the acquisition of fertile lands, such as Thessaly and Macedonia, could increase the tax base and hence tax revenues. On the other hand, the pre-existing Ottoman fiscal institutions of new acquired lands had to be replaced, possibly resulting in lower initial revenues. Turning to political transformations, we find that an improvement in the quality of democracy lessens the degree of public spending procyclicality while at the same time reduces the tax revenue buoyancy. This finding is consistent with Dertilis (2015) and Koutentakis (2023) who argue for the detrimental effects of democracy on tax revenue. Furthermore, wars are positively associated with the degree of cyclicality of public spending and also lead to an increase in tax buoyancy, in order to finance increased military spending. Finally, bankruptcies are negatively associated with the degree of cyclicality of civilian and primary spending, while there is a positive correlation between bankruptcies and total revenue and indirect taxes buoyancy. This finding suggests that bankruptcies are another device for fiscal discipline, in addition to rising public debt and justifies the importance of fiscal prudence (i.e. to discipline before a default in order to prevent it).

With respect to the medium-term fiscal effects, we find that a war episode increases primary and military expenditures, and to a lesser extent civilian expenditures. Conversely, a default episode reduces these expenditures. A war shock leads to increases in both total revenues and tax revenues, as a result of the government's efforts to collect tax revenues to finance the unanticipated costs of war, effectively verifying the relevance of the 'war made the state' argument in the case of Greece, as argued by both Koutentakis (2023) and Kakridis (2024). In contrast, following a bankruptcy, total and tax revenues decline sharply over the medium-term. In addition, we find that the

debt-service to-GDP ratio significantly increases after the outbreak of a war. Finally, both war and default episodes reduce economic activity, particularly in the first 5 years following the shock.

The remainder of the paper is organized as follows. Section 2 presents the data and discusses methodological issues and the baseline findings regarding the cyclicality for both spending and revenue side components of fiscal policy. Section 3 presents the econometric model and the key findings regarding the medium-term effects on economic activity and fiscal variables resulting from a shock to a default and a war episode. Finally, Section 4 concludes.

2 Historical outlook, Data & Methodology

2.1 Brief political history of Greece

Greece became an independent state in 1830[1], following a decade-long revolutionary war against the Ottomans and an international intervention by the Great Powers (Britain, Russia and France). A young Bavarian prince, Otto, became the king of Greece and ruled as an absolute monarch for about a decade with the help of a regiment of Bavarian troops and an international loan guaranteed by the Great Powers. That was the time when the basic centralized fiscal institutions, such as the Treasury and the Court of Audit, were established. In 1843, a debt default on the guaranteed loan and a political uprising forced Otto to accept a constitution, providing, among others, for parliamentary approved budgets and consistent fiscal reporting while at the same time Greece became the first modern state to establish durable universal male suffrage (Przeworski, 2009). Otto remained on the Greek throne until his expulsion in 1862, to

[1] The independence of Greece was formally recognized by the Great Powers (Britain, France, and Russia) in the London Protocol of 1830.

be replaced by another young prince, of Danish origin this time, who reigned Greece for the next 50 years.

The new king, George I, brought along a more liberal constitution, a settlement for the 1843 default and the annexation of the formerly British Ionian Islands. That was the first in a series of territorial expansions of the Greek state that took place in the coming decades. In 1881, after the Balkan crisis and the Russo-Ottoman war of 1877-78, the Greek border expanded northward to include the region of Thessaly and the city of Arta. Greece did not have to fight an actual war for this territorial gain, as it was achieved via diplomatic means, but it took a series of army mobilizations to improve her bargaining position. The cost of these mobilizations was covered by external loans that had only recently (1878) become available for Greece. In fact, successive Greek governments made extensive use of international loans, mostly directed towards military spending, until the default of 1893. While still bargaining with bondholders, Greece engaged in a short-lived war against the Ottomans, in 1897, that ended in disastrous defeat. In exchange for the international intervention that spared Greece from territorial losses, a debt settlement was imposed, a new guaranteed loan was floated, and an International Financial Committee was established to take over debt service and a substantial part of public revenue.

After a relatively smooth first decade of the 20th century, the next and much bloodier phase of territorial expansion took place in the Balkan wars of 1912-13 when Greece acquired large parts of Epirus and Macedonia from the Ottomans. About that time, the death of king George I and his succession by his son Constantine in 1913 triggered a period of internal conflict between the palace and the liberal government that peaked during the participation of Greece in the First World War. Eventually, with the help of

Entente forces, the liberal government obliged the king to leave the country and Greece mobilized and fought in the Balkan front against the Central Powers.

That was the endgame of Greek border expansion under the period we examine (since Greece acquired the Dodecanese after World War II), that offered substantial territorial gains but at the cost of a huge wartime debt, violent political strife and the inflow of more than a million refugees. To accommodate these challenges, the Greek state made substantial efforts to improve its public finances with a series of emergency measures and extraordinary taxes. Still, most of the improvements achieved, such as the adoption of the gold standard and the establishment of the Bank of Greece, collapsed in the wake of the 1929 global recession. Greece abandoned the gold standard and defaulted on her external debt in 1932. A few years later, in 1935, monarchy was restored (it had been abolished in 1924) and a dictatorship was imposed in 1936.

2.2 Data and the procyclical bias of the past

The paper utilizes the unique dataset for historical public finances of Greece constructed by Koutentakis (2023) and Kammas and Koutentakis (2024). Compared with previous studies (Prontzas et al., 2011; Lazaretou, 2014; Dertilis, 2015) the dataset is more detailed, allowing for the estimation of more than a few measures of fiscal cyclicality. The main advantage of Koutentakis' (2023) dataset is the separation between the financial and the primary parts of the budget. The former contains loans and debt service whereas the latter includes several revenue and spending items such as direct and indirect taxes, tariffs, arrears as well as military and civilian spending. (see

Table 1).[2] Thanks to the consistency of the dataset with modern day fiscal accounts, our estimates allow us to draw valuable conclusions regarding the present.

When comparing the past with the present it is important to acknowledge that 19th century policy makers faced different objectives and constraints from their modern-day colleagues. In particular, we need to consider two important differences, both of which introduce procyclical bias in 19th century fiscal policies. The first is the state of economic knowledge, in particular the limited fiscal understanding in the world before Keynes, when the implications of fiscal policy on aggregate activity were largely unknown and definitely outside the government policy toolkit. In addition, the global system relied on the gold standard which reserved a more important role for monetary policy, rather than fiscal. Still, while unaware of multipliers and cyclicality, 19th century treasuries were anything but fiscally irresponsible. According to the dominant classical economics paradigm, public borrowing and debt should generally be avoided, reserved only for emergency cases, such as wars. We may imagine 19th century fiscal policy makers to be careful with spending during upswings but without any expansionary incentive during recessions. The former may reflect the fiscal conservatism of the government and can vary only in degree between now and then but the later implies a procyclicality bias during recessions.

The second is the limited role – or even total absence – of automatic stabilizers. 19th century states were much less concerned with welfare provisions and perhaps even less with progressive taxation. Hence, all other things being equal, we would expect fiscal policy to have been more procyclical in the past than it is today with the countercyclical part of automatic stabilizers. Another way to put this is that what we actually observe

[2] For more information on the construction of this new Greek fiscal dataset see Koutentakis (2023) and Kammas and Koutentakis (2024).

in a 19th century economy is closer to the discretional part of fiscal policy, rather than the mix of discretionary and automatic elements that we observe in a late 20th century economy. A related issue is the different structure of public spending in the government budgets of the past when a much larger share was reserved for military spending than for social transfers, public investment and civil administration. It follows that we need to separate military from civilian spending.

2.3 Government spending cyclicality and tax revenue buoyancy

Building on this unique dataset this paper investigates the degree of government spending cyclicality and tax revenue buoyancy in Greece in the 19th and the early years of the 20th century. On the spending side, the dependent variables are primary spending, and its two subcomponents military and civilian spending. On the revenue side, the main dependent variable is total revenue. However, we also examine its two main subcomponents total taxes (i.e., the sum of direct and indirect tax revenue) and other revenue.[3] All the variables are expressed in real terms, using the GDP deflator, to avoid any expansion in government spending or revenues, resulting from a rise in the relative prices of public sector (see e.g., Lane, 2003). Data for GDP are taken from Kostelenos et al. (2007), while the GDP deflator is taken from Bank of Greece (South-Eastern European Monetary and Economic Statistics from the Nineteenth Century to World War II)[4].

Following Jalles (2018, 2021), Afonso and Carvalho (2022), and Chrysanthakopoulos and Tagkalakis (2023, 2024), we estimate:

[3] Other revenue is further decomposed to tariffs, royalties, monopolies etc. However, these revenue components are not examined further as they are not affected significantly by the level of economic activity.
[4] GDP and fiscal variables are expressed in drachmas, the local currency of the Greek state in the period under review. GDP deflator (1914=100).

$$\Delta \ln(FP_t) = a_t + \beta_t * \Delta\ ln\ (GDP_t) + \varepsilon_t\ (1)$$

where FP denotes the abovementioned spending and revenue components. Δln(GDP) is the real GDP growth rate. Our coefficient of interest is β_t which indicates the extent of fiscal cyclicality in Greece; if $\beta_t > 0$ then government spending is pro-cyclical , if $\beta_t < 0$ then government spending is counter-cyclical, while if $\beta_t = 0$ we have an a-cyclical fiscal policy.

Turning to the revenue variables, the β coefficient relates to the tax buoyancy concept, i.e., the change in tax revenues following changes in output. This change in tax revenues incorporate both the automatic response of tax revenue and the discretionary tax policy changes i.e., changes in tax rates, tax brackets, tax base broadening etc. (see Belinga et al. 2014; Tagkalakis, 2014; Dubine and Jalles, 2018). Given that we do not have information that would help us isolate the discretionary changes in tax policy of the period under examination, we cannot refer to the estimated coefficient β as tax elasticity. Therefore, when β > 1 the tax system is buoyant as it can generate more revenues than the associated increase in real GDP; the opposite holds when β<1.

Building on the above studies we assume that β_t changes slowly and unsystematically over time and its expected value today, is equal to its value from yesterday[5]. The change in β_t is signified by u_{it}, which is normally distributed with zero mean and variance σ^2. Hence:

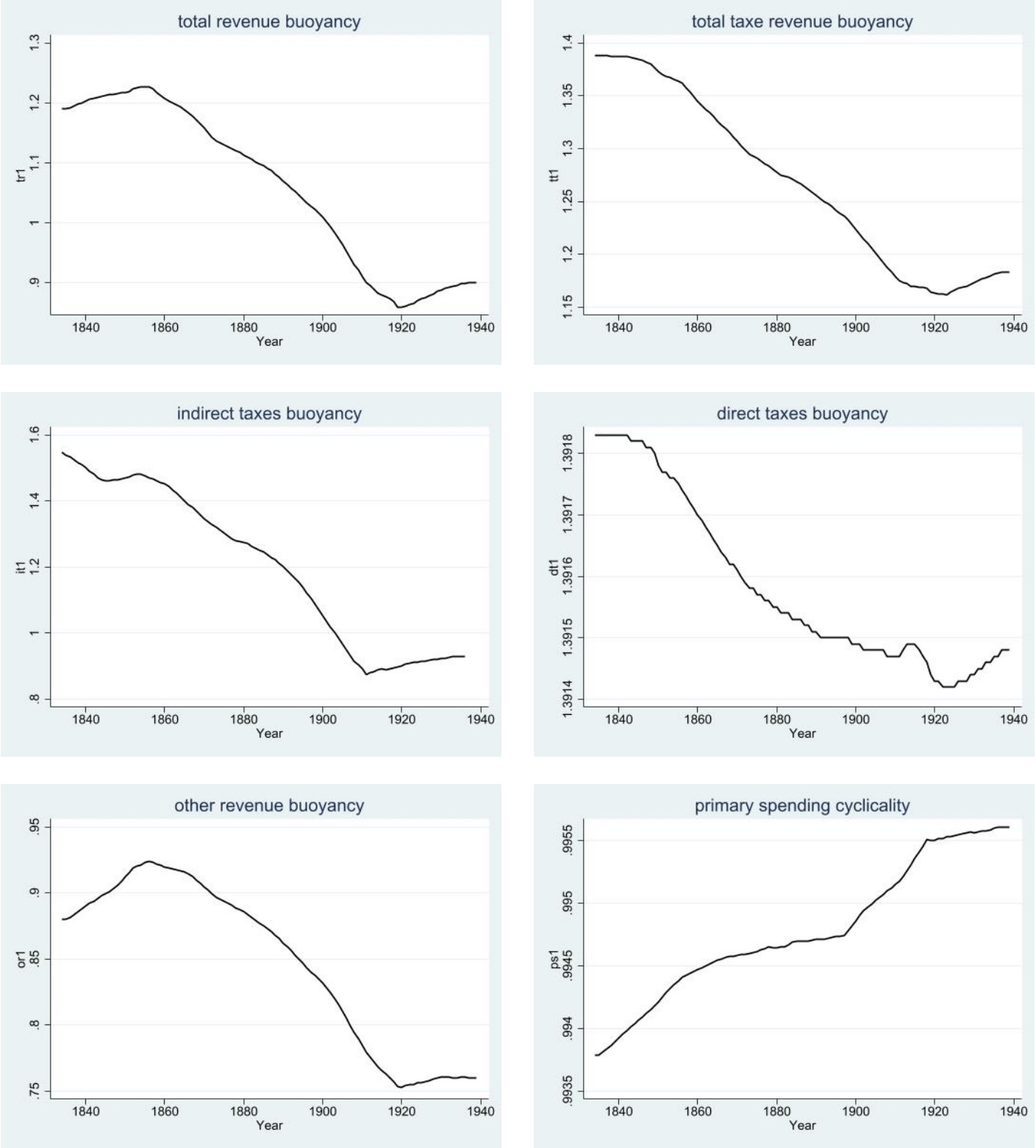
$$\beta_t = \beta_{t-1} + u_t,\ \ where\ \ u_t \sim N(0, \sigma^2)\ (2)$$

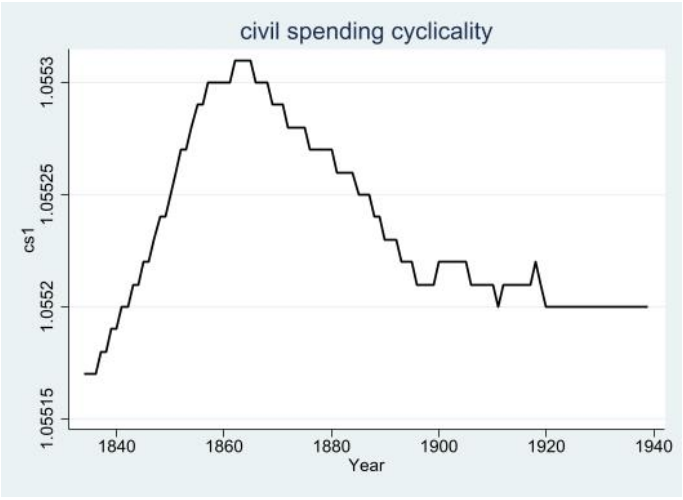
Equations (1) and (2), are jointly estimated with the Varying Coefficient method as

[5] The model assumes that the parameters (i.e., β_t) evolve according to a random walk process, implying that they are autocorrelated and change slowly over time in response to the data. This assumption ensures that all changes in the coefficients are data-driven, allowing for flexibility in capturing time-varying relationships in the model, without induced by the structure of the model.

pioneered by Schlicht (2003).

Figure 1. Estimated βs.





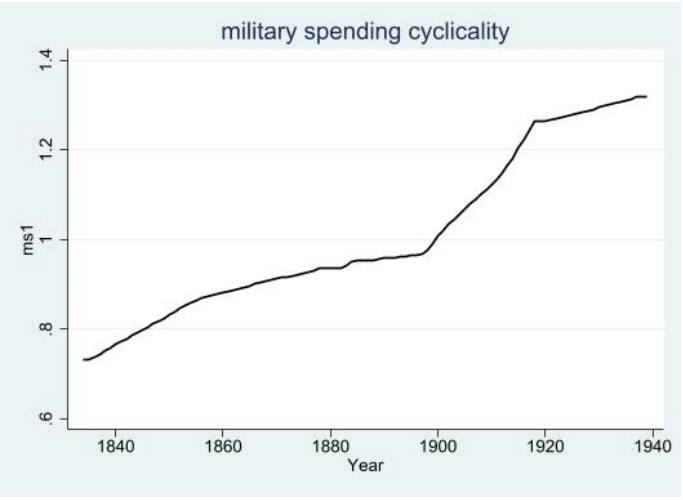


Figure 1 reports the level of the estimated β_t coefficient for each component of fiscal policy. Starting from the spending side of the budget we observe that primary spending is procyclical, and the estimated coefficient β increases over time. Hence, following an increase in real GDP, primary spending increases further contributing to the overheating of the economy and a deficit bias. Turning to the spending sub-components, we see that this procyclicality is primarily due to military spending. Civil spending is procyclical over the first 20-25 years of the sample, but thereafter the degree of pro-cyclicality diminishes until the end of the 19th century and remains stable thereafter. This latter finding is especially interesting as it indicates that the improvement of democratic institutions (e.g. the liberal constitution of 1864) led to decreasing cyclicality of civilian spending, casting some doubt on the importance of voter preferences (Alesina and Tabellini, 2005).

Turning to the revenue side of the budget, we observe a declining tax buoyancy across all revenue sub-components until the first decades of the 20th century and a gradual increase in tax buoyancy from the 1920s to the end of the sample. The estimated coefficient β for total revenue remains above 1 from the start of the sample till about

1900, thereafter it takes values below 1. This is primarily due to other revenue, whose estimated β is below 1 over the whole sample. On the contrary, in case of tax revenues, despite its declining trend, the estimated tax buoyancy remains above 1 over the whole sample. This is attributed to direct taxes, whose estimated β is close to 1.4. In case of indirect taxes, the estimated β follows downward trend and falls below 1 at around 1900. It remains below 1 despite its gradual pick up from 1910 onwards.

2.4 Determinants of government spending cyclicality and tax revenue buoyancy

Building on the estimated βs we next examine the likely factors that could affect government spending cyclicality and government revenue buoyancy. Building on previous studies (such as, Aghion et al., 2008; Jalles, 2018; 2021; Chrysanthakopoulos and Tagkalakis, 2023; 2024) we estimate:

$$\hat{\beta}_t = a_0 + a_1 * \ln(X_{t-1}) + \varepsilon_t \quad (3)$$

Where $\hat{\beta}_t$ signifies the time varying coefficients obtained earlier, a_0 is a constant term, ε_t is the error term and $X_{t-1}$is a vector of control variables, which includes the first lag of the debt service to GDP ratio[6] as high indebted economies tend to run countercyclical fiscal policies (see e.g., Afonso and Jalles, 2019; Chrysanthakopoulos and Tagkalakis, 2024), the change in the first lag of the natural logarithm of population, the first lag of the democracy index (V-dem) which describes the political regimes[7], the first lag of a dummy variable equal to 1 signifying a year in

[6] Due to data limitations, we use the debt service to GDP ratio and not the debt to GDP ratio.
[7] The V-dem index (v2xlg_legcon) measures legislative constraints to executive power and is obtained from https://www.v-dem.net/data/the-v-dem-dataset/.

which Greece is engaged in war[8], and the first lag of a dummy variable equal to 1 signifying a year in which Greece undergoes bankruptcy.[9] Given that the dependent variable in equation (3) is based on estimates, we estimate our model with Weighted Least Squares (WLS), to accommodate the existence of un-measurable error term. Summary statistics are reported in Table 1.

Table 1. Summary statistics

	Mean	St. Dev.	Min	Max	N
Total revenue	18.52	2.18	15.82	23.34	107
Tax revenue	17.73	2.16	15.30	22.68	107
Direct tax revenue	17.21	1.89	15.20	21.82	107
Indirect tax revenue	16.66	2.66	12.02	22.13	107
Other revenue	17.89	2.23	14.91	22.65	107
Primary spending	18.51	2.18	16.25	23.47	107
Military spending	17.60	2.11	15.43	22.41	107
Civilian spending	17.95	2.24	15.30	23.34	107
Nominal GDP	20.33	1.99	17.81	24.75	107
Real GDP	20.02	0.85	18.58	21.68	107
Deflator	11.77	1.24	10.58	14.58	107
Real GDP per capita	12.36	0.18	11.94	12.82	107
War	0.08	0.27	0	1	107
Bankrupt	0.04	0.19	0	1	107
V-dem	0.53	0.20	0.16	0.75	107
Military spending per capita	1.14	0.74	0.58	7.28	107
Population	2730788	2007750	719040	7318915	107
Debt-services to GDP	5.34	3.24	1.82	22.26	107
Primary spending to GDP	17.19	6.33	9.64	33.75	107
Military spending to GDP	7.42	4.32	2.72	21.51	107
Civilian spending to GDP	9.77	4.43	5.87	42.42	107
Total revenue to GDP	17.05	4.91	9.22	48.55	107
Tax revenue to GDP	7.84	2.68	3.95	16.97	107

Notes: Authors calculations.

2.4.1 Findings

Table 2 presents the empirical estimates of equation (3). An increase in the debt service ratio induces a negative effect on the government spending cyclicality, i.e., government

[8] The Greek-Turkish war (1897), the First Balkan war (1912-1913), the Second Balkan War (1913), the World war I (1917-18) and the Asia Minor campaign (1919-22).

[9] Following Reinhart and Trebesch (2015) the Greek state experienced a bankruptcy in 1843, 1893, 1897 and in 1932. The year 1897 is considered as a third bankruptcy in Greece, as it was followed by defeat and a peace treaty with Turkey, leading to the restructuring of the Greek debt.

spending (in particular, military spending) becomes less procyclical (see columns 6-8). Tax buoyancy of total taxes increases following an increase in the debt service ratio (see column 2). This effect is due to the positive response of direct taxes. An increase in the population raises the procyclical response of military, civilian and primary spending (column 6-8). The gradual expansion of the geographical extent of the Greek state and the subsequent increase in population during the period under review led to additional increases in expenditure and more pro-cyclical public spending. On the government revenue side, population growth contributed to an increase in total revenue and other revenues (see columns 1, 3).

As shown in Table 2, an improvement in the quality of democracy (i.e. an increase in the V-dem index) reduces the degree of procyclicality of public spending while at the same time reduces the tax revenue buoyancy (but not other revenue). This is consistent with Plümper and Martin (2003) who report that an increase in democratic governance is usually positively correlated with increased growth rates of per capita income. A fact linked to less cyclicality in public spending and taxes (Vegh and Vuletin, 2015). Note that the negative relationship between the introduction of democracy (universal suffrage in 1844 and 1864) and cyclicality of government spending is at odds with Alesina and Tabellini (2005) who claim that voters' behavior induces cyclicality.

A war is positively associated with the degree of cyclicality of military, civilian and primary spending, which is in line with Rasler and Thompson (1985) who found that wars often have sudden and permanent escalating effects on spending. At the same time, rising military expenditures lead to an increase in revenue (except in the case of other revenue and indirect taxes) to finance the aforementioned expenditures, in line with the 'war made the state' argument (Tilly, 1975), i.e. the positive impact of warfare on the development of fiscal capacity. This in turn leads to a positive impact on estimated tax

buoyancy. Finally, a bankruptcy is negatively associated with the degree of cyclicality of civilian and primary spending (see columns 6 and 8), as a country needs to generate more available domestic resources since borrowing from abroad is unaffordable most of the time. On the other hand, there is a positive correlation between bankruptcies and total revenue and indirect taxes buoyancy.

Overall, initial poor fiscal conditions can mitigate the procyclicality of primary spending which can lead to a deficit and debt bias, as the state is compelled by market forces to correct fiscal imbalances in order to re-gain market access. In addition, improved democratic governance can contribute to more stable and prudent fiscal management. Moreover, territorial expansions (as proxied by increase in the population) can result in higher tax revenues; however, the accompanying increase in procyclicality of expenditures can lead to a deficit and debt bias. Finally, prudent fiscal management with counter-cyclical policies should be pursued to ensure that the country is better prepared and has the appropriate fiscal buffers to effectively react in periods of crisis.

Table 2. Determinants of government spending cyclicality and tax revenue buoyancy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	total revenue	total taxes	other revenue	indirect taxes	direct taxes	civil spending	military spending	primary spending
Debt service (t-1)	7.48e-07	3.23e-06*	-8.21e-08	-2.57e-07	0.00145	-3.07e-07	-0.0186**	-0.00851**
	(4.92e-07)	(1.87e-06)	(1.98e-07)	(7.94e-07)	(0.0385)	(2.28e-06)	(0.00726)	(0.00368)
ΔPopulation (t-1)	1.63e-05***	1.94e-05	2.25e-05***	-4.42e-05***	-0.0169	0.000367***	1.418***	0.679***
	(3.62e-06)	(1.23e-05)	(1.95e-06)	(5.31e-06)	(0.270)	(1.33e-05)	(0.0466)	(0.0209)
Vdem (t-1)	-7.63e-05***	-0.000411***	9.21e-05***	-0.000123***	-0.599	7.03e-05	-1.940***	-0.774***
	(1.22e-05)	(4.58e-05)	(7.02e-06)	(1.93e-05)	(0.577)	(5.00e-05)	(0.188)	(0.0843)
War (t-1)	2.96e-06	3.19e-05**	-3.95e-06	-2.12e-05***	0.197	9.95e-05***	0.247**	0.151***
	(4.82e-06)	(1.48e-05)	(3.78e-06)	(6.55e-06)	(0.536)	(2.79e-05)	(0.105)	(0.0484)
Bankruptcy (t-1)	9.57e-06*	3.42e-05	-1.60e-06	1.04e-05*	0.441	-6.81e-05***	-0.267	-0.147*
	(5.70e-06)	(2.78e-05)	(4.83e-06)	(5.55e-06)	(0.279)	(2.07e-05)	(0.205)	(0.0865)
Constant	0.275***	0.503***	0.0747***	0.391***	1.063	0.318***	-19.26***	-9.179***
	(4.81e-05)	(0.000163)	(2.55e-05)	(6.87e-05)	(3.607)	(0.000173)	(0.601)	(0.269)
R-squared	0.242	0.534	0.924	0.867	0.028	0.947	0.913	0.926

Notes: Dependent variable: Time varying coefficients of fiscal policy. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

3 The medium-term effect of war and bankruptcy episodes

Based on the same historical dataset, we examine the direct effects of both a war shock and a default or bankruptcy shock on fiscal variables (i.e., primary/political/military expenditures to GDP, total/tax revenues to GDP, debt service to GDP) and economic activity in the newly formed Greek state. Following Auerbach and Gorodnichenko (2012, 2013) and Ramey and Zubairy (2018), we rely on the Local Projection method (LP) pioneered by Jorda (2005), since the LP method offers several advantages over Vector Auto-Regressions (VARs).[10]

To this end, we estimate the following equations[11]:

$$(G/Y)_{t+h} - (G/Y)_{t-1} = a^h + a_1^h[(G/Y)_{t-1} - (G/Y)_{t-2}] + a_2^h \Delta X_{t-1} + a_3^h Vdem_{t-1} + a_4^h (D/Y)_{t-1} + a_5^h (war\ or\ bankruptcy)_{t-1} + a_6^h shock_t + \varepsilon_{t+h} \quad (4)$$

$$(R/Y)_{t+h} - (R/Y)_{t-1} = a^h + a_1^h[(R/Y)_{t-1} - (R/Y)_{t-2}] + a_2^h \Delta X_{t-1} + a_3^h Vdem_{t-1} + a_4^h (D/Y)_{t-1} + a_5^h (war\ or\ bankruptcy)_{t-1} + a_6^h shock_t + \varepsilon_{t+h} \quad (5)$$

$$(D/Y)_{t+h} - (D/Y)_{t-1} = a^h + a_1^h[(D/Y)_{t-1} - (D/Y)_{t-2}] + a_2^h \Delta X_{t-1} + a_3^h Vdem_{t-1} + a_4^h (war\ or\ bankruptcy)_{t-1} + a_5^h shock_t + \varepsilon_{t+h} \quad (6)$$

[10] Some of the advantages: (1) simple regression techniques, (2) greater resilience to misspecification, and (3) straightforward implementation of joint or point-wise analytic inference (for further information see the above-mentioned papers).

[11] Following the ADF tests, all variables enter in first differences (except the debt service to GDP ratio and V-dem index). The lag-length is set to one after consultation of the Akaike's information criterion (AIC), the Schwarz's Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC).

$$(Y)_{t+h} - (Y)_{t-1}$$

$$= a^h + a_1^h[(Y)_{t-1} - (Y)_{t-2}] + a_2^h \Delta X_{t-1} + a_3^h Vdem_{t-1} + a_4^h debt_{t-1}$$

$$+ a_5^h (war\ or\ bankruptcy)_{t-1} + a_6^h shock_t + trend_t + \varepsilon_{t+h} \quad (7)$$

Where $(G/Y)_{t+h} - (G/Y)_{t-1}$ is the cumulative change in the primary spending (civilian or military spending) to GDP. $(R/Y)_{t+h} - (R/Y)_{t-1}$ indicates the cumulative change in total revenue (tax revenue) to GDP; $(D/Y)_{t+h} - (D/Y)_{t-1}$ is the cumulative change in the debt service to GDP ratio, and $Y_{t+h} - Y_{t-1}$ is the cumulative change in the natural logarithm of the real GDP. The forecast horizon h takes values from 0 up to 9 years ahead.

The variable $shock_t$ represents a war shock or bankruptcy shock occurring at time h=0. Equations (4)-(7) include as control variables the first lag of the democracy index (V-dem). Depending on the shock (war or bankruptcy) examined each time, we control for the lagged value of the remaining dummy variable, i.e., when the shock variable is war at t, we control for the presence of default or bankruptcy at time t-1, and vice versa. In each specification we control for the lagged value of the dependent variable, [12] and for the lagged value of the debt service to GDP ratio. Finally, in equation (7) we control for the lagged value of the difference of primary spending and total revenue to GDP (ΔX_{t-1}), while in all other equations the vector ΔX_{t-1} controls for the lagged value of the difference of real GDP.

ε_{t+h} is the error term, which is assumed to have a zero mean and strictly positive variance, $trend_t$ is a deterministic time trend that is used only in equation (7). Equations (4)-(7), are estimated by means of an OLS technique.

[12] In the case of equation (4), when we use as dependent variable the cumulative change in civilian spending to GDP and the cumulative change in military spending to GDP ratio, instead of the lagged value of the dependent variable as independent variables we use both the lagged values of the civilian and the military spending to GDP ratios (as in Kakridis, 2024)

3.1 Findings

Figure 2 reports the results based on equations (4)-(7). The solid line depicts the cumulative response of primary spending to GDP (first row), military spending to GDP (second row), civilian spending to GDP (third row), total revenue to GDP (fourth row), tax revenue to GDP (fifth row), debt service to GDP (sixth row) and real GDP (seventh row) from year h=0 to year h=9, in response to a war shock (left column) and a default or bankruptcy shock (right column) at h=0. The grey-shaded area corresponds to the 68% confidence bands.

A war conflict in period 0 results in an increase in military spending and therefore increases overall primary spending. However, this rise only lasts for a period of about 3 years. Then military spending declines. As a result of the war conflict, political expenses also increase marginally in the first years of the war, but their increase is significantly greater 5 to 9 years after the war, apparently to finance the costs of reconstruction or integration of the areas liberated by the war into the Greek state. At the same time, as a result of the war, the ratio of total revenues to GDP and the ratio of tax revenues to GDP increase in order to finance, in the first phase, the war campaign and, in the second phase, the integration of the liberated areas into the Greek state.

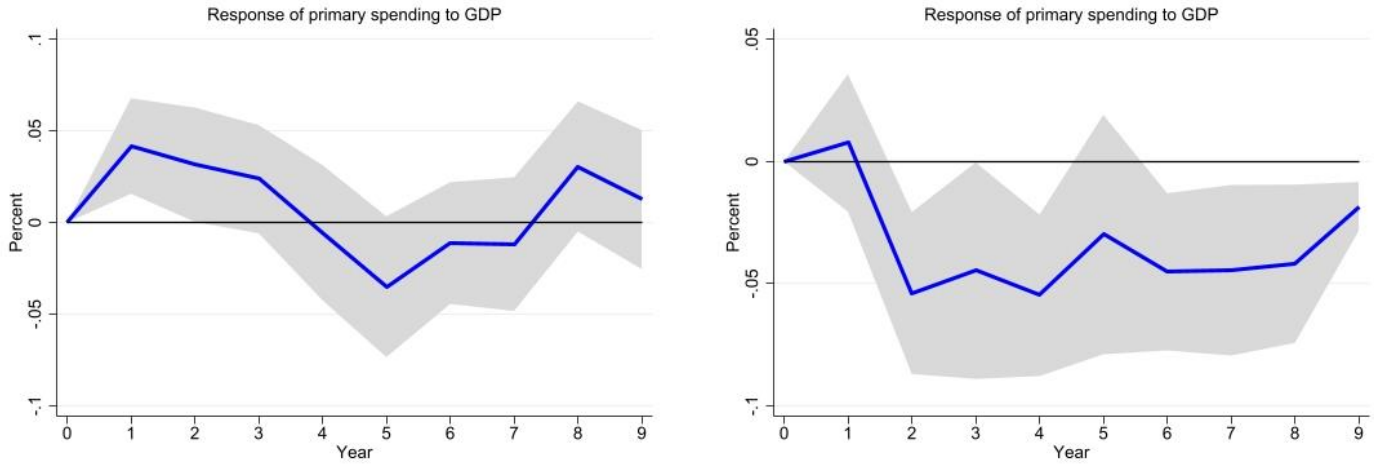
Despite the increase in public revenue relative to GDP to finance war expenditures, the war leads to an increase in debt servicing costs. Notwithstanding the associated increase in public spending, war has negative effects on economic activity, as it leads to loss of human life, destruction of physical capital and, due to potential conscription, a decline in non-war related activity. It follows that the above-mentioned increase in public revenue as a percentage of GDP due to the war arises only through discretionary tax

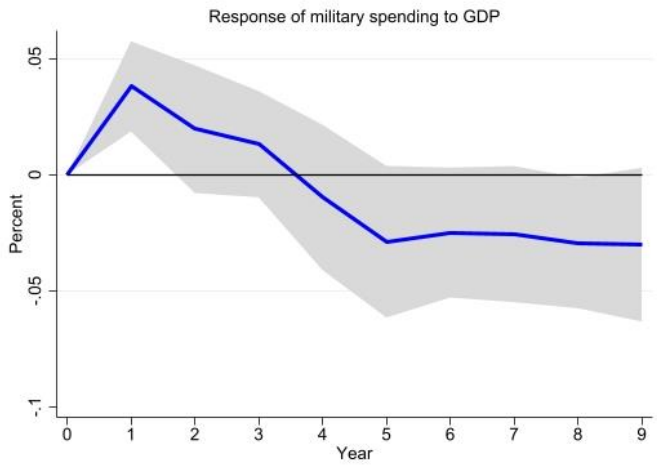
policies and not through an increase in economic activity. This offers another verification for the ‘war made the state’ argument.

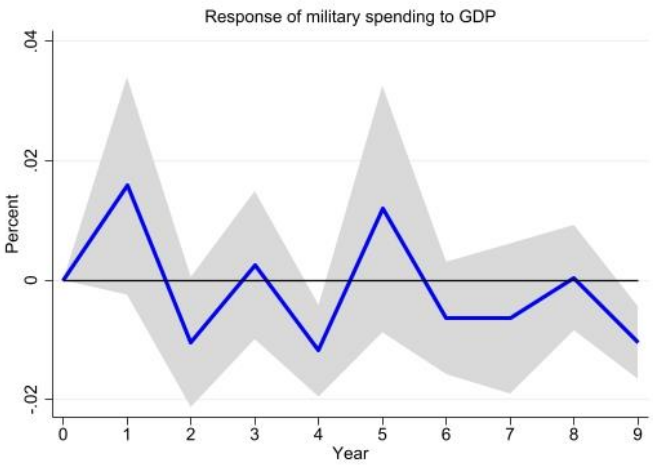
In the event of a bankruptcy, primary expenditures decline, especially those considered civilian expenditures. In contrast, military spending is not affected. Government revenue as a percentage of GDP declines with the maximum negative effect being 5 years after the initial shock. However, the fact that expenditures fall marginally more than revenues implies that there is no significant change in public debt. However, economic activity declines after a default shock, with the maximum negative effect occurring 5 years after the shock, as limited and more expensive foreign borrowing prompts fiscal tightening which in turn has knock-on effects on economic activity.

The findings indicate that adverse and unanticipated events, such as wars and bankruptcies, harm economic activity and public finances. Therefore, a country must be better prepared during good periods to effectively mitigate the negative consequences of such extreme shocks.

Figure 2. Response of fiscal policy following a war and a bankruptcy shock.




Response of military spending to GDP
Percent
-.1
-.05
0
.05
0
1
2
3
4
5
6
7
8
9
Year


Response of military spending to GDP
Percent
-.02
0
.02
.04
0
1
2
3
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6
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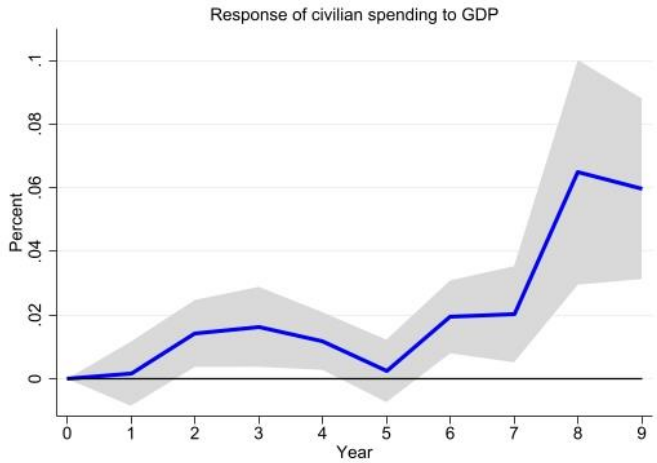
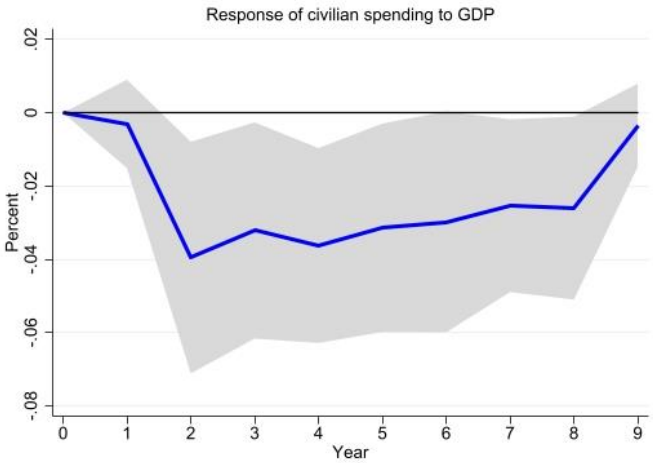
8
9
Year


Response of civilian spending to GDP
Percent
0
.02
.04
.06
.08
.1
0
1
2
3
4
5
6
7
8
9
Year


Response of civilian spending to GDP
Percent
-.08
-.06
-.04
-.02
0
.02
0
1
2
3
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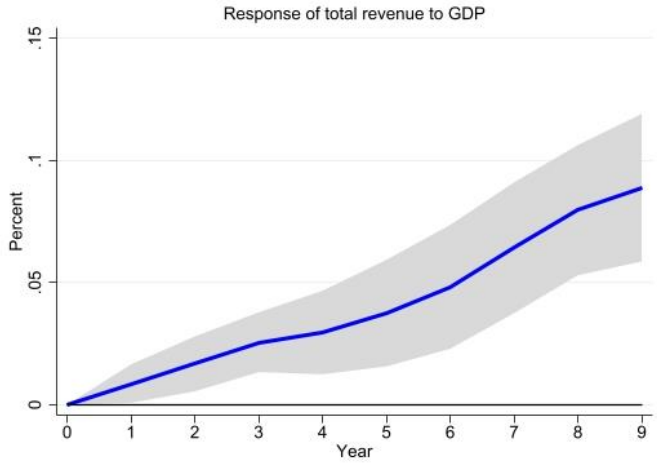
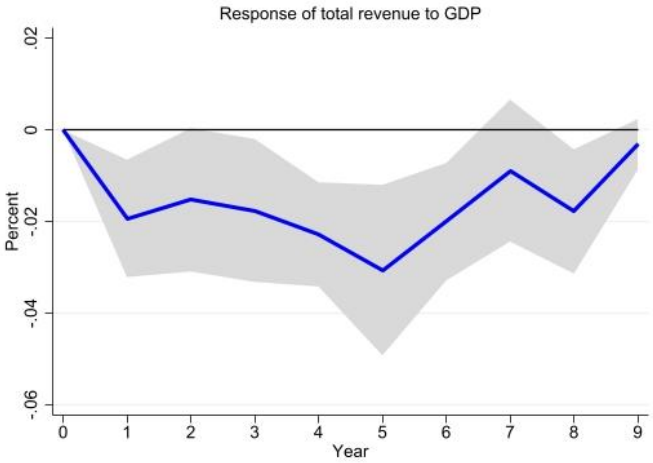
5
6
7
8
9
Year


Response of total revenue to GDP
Percent
0
.05
.1
.15
0
1
2
3
4
5
6
7
8
9
Year


Response of total revenue to GDP
Percent
-.06
-.04
-.02
0
.02
0
1
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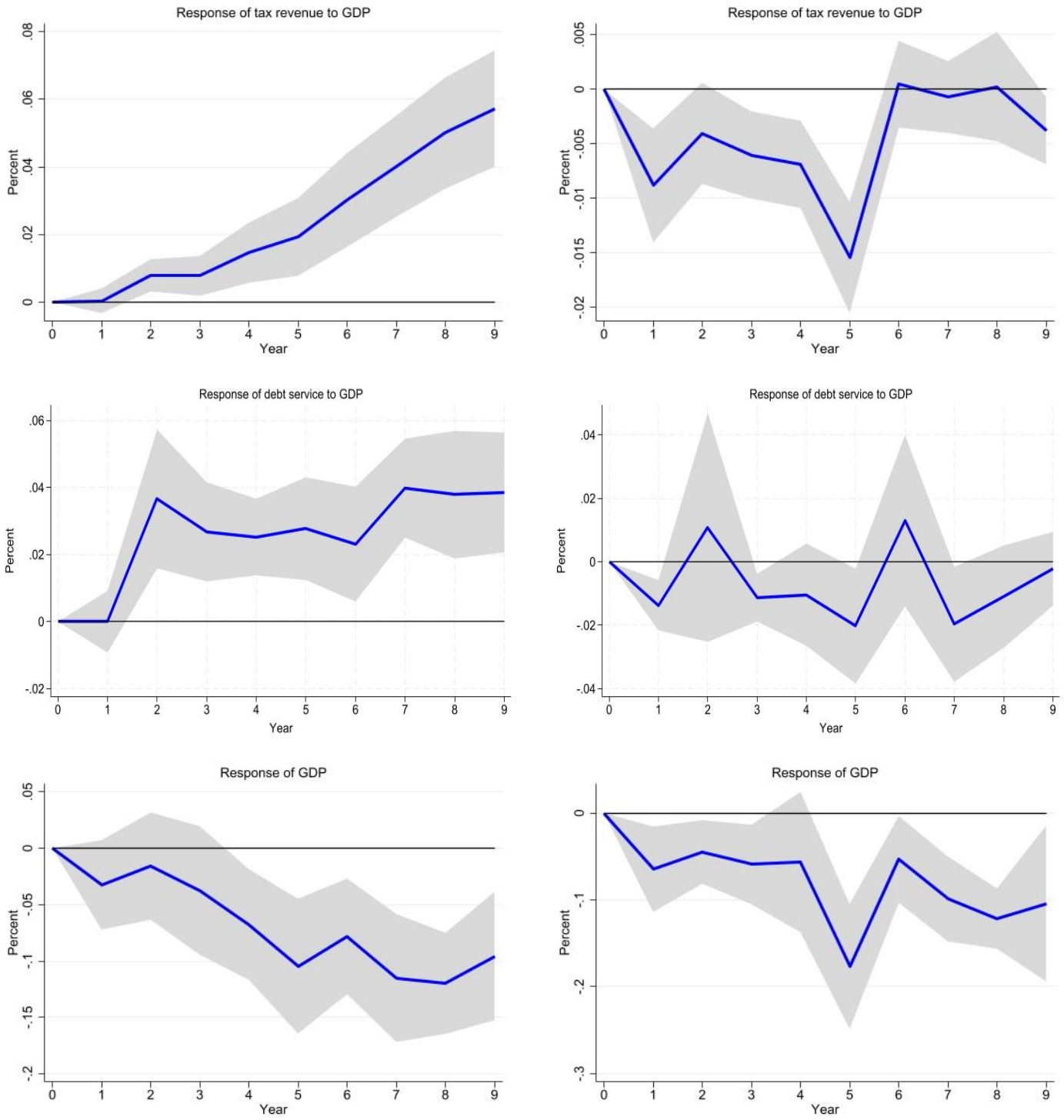
Year



Notes: Figure 3 reports the cumulative response of primary spending to GDP (first row), military spending to GDP (second row), civilian spending to GDP (third row), total revenue to GDP (fourth row), tax revenue to GDP (fifth row), debt service to GDP (sixth row) and real GDP (seventh row). Left column refers to a war shock and right column refers to a bankrupt shock. Shaded area indicates the 68% bands.

4 Conclusions

The present study utilizes a novel historical dataset of Greek public finances, covering the period from national independence to World War II, specifically from 1833 to 1939

(see Koutentakis, 2023). The new database of historical fiscal data allows us to gain a more comprehensive look at the role of various critical factors influencing fiscal policy in general and in Greece in particular even today. We examine issues related to the cyclical behavior of public spending and how a pro-cyclical reaction can ultimately lead to deficit and debt bias. We study the ability of the tax system to generate revenue in proportion to an increase in economic activity. Finally, we examine whether and to what extent extraordinary events such as war conflicts and bankruptcies, i.e. events that were more frequent in the 19th and early 20th century, can lead to persistent effects on economic activity and fiscal performance. We find that primary spending is procyclical, and this tendency increases over the years. The successive increases in the size and population of the Greek state resulted in an increase in the cyclicality of primary expenditure, mainly due to military and secondarily due to political expenditure, which inevitably led to a deficit and debt bias. We also find a declining tax buoyancy across all revenue sub-components until the first decades of the 20th century and a gradual increase in tax buoyancy from the 1920s to the end of the sample. The estimated tax revenue buoyancy remains above 1 over the whole sample, suggesting that the tax system could generate proportionally more revenue than a given increase in economic activity.

According to our findings, poor initial fiscal conditions can limit the pro-cyclical behavior of public spending and increase the buoyancy of tax revenues. Improvements in the quality of democracy can also bring about a reduction in the pro-cyclicality of public spending. Wars, however, increase the procyclicality of military expenditures as well as the tax buoyancy of tax revenues. Bankruptcy cases limit the procyclicality of civilian spending.

Finally, a war episode increases primary and military spending, and to a lesser extent civilian spending, in the medium-term, while an episode of bankruptcy reduces public spending, due to inevitable fiscal tightening. In addition, a war leads to an increase in both total and tax revenue as a result of the government's efforts to collect tax revenue to finance the cost of war and the post-war reconstruction. At the same time, after a default, government and tax revenues fall sharply in the medium-term. The debt-service to-GDP ratio rises significantly after the outbreak of a war, while both a war shock and a bankruptcy episode reduce economic activity, particularly in the first five years after the shock.

The findings of this paper offer several policy implications for managing public finances. First, adverse and unforeseen events like wars and bankruptcies impact negatively on economic activity and on fiscal balances. Public spending procyclicality should be avoided as it can lead to a deficit and debt bias. Enhancing the quality of institutions can reduce the procyclicality of public spending, contributing to more stable fiscal management. Strengthening the tax system to maintain high tax buoyancy is vital for ensuring a stable or rising tax to GDP ratio in the medium-term. In this context, modernizing tax administration and enhancing mechanisms to reduce tax evasion are crucial for maximizing revenue potential.

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