



## ORIGINAL ARTICLE

# Fiscal policy under constraints: Fiscal capacity and austerity during the Great Depression

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**Abstract**

The Great Depression was characterized by widespread fiscal policy mistakes in the form of a contractionary or insufficiently expansionary fiscal stance. Despite this general conclusion, there were large differences in the conduct of fiscal policy between countries. I find that a higher degree of fiscal capacity helped countries run less procyclical fiscal policies by allowing them to borrow more extensively. Lower borrowing costs only partially explain this finding. Taken together, the results indicate that inter-war governments were constrained in their policies by past investments in fiscal capacity, and not just by Gold Standard membership, ideology, and inadequate knowledge, as commonly held in the literature.

**KEYWORDS**

fiscal capacity, fiscal policy, Great Depression

**JEL CLASSIFICATION**

E62, H63, N10, N4

There is a consensus that the limited use of countercyclical macroeconomic policies during the Great Depression – and, in some cases, the implementation of downright procyclical ones – contributed to the severity of the slump.<sup>1</sup> Besides economic consequences, inadequate policy responses also had political repercussions. The rise of right-wing extremism, in particular, was

<sup>1</sup> Keynes, *Means to prosperity*; Temin, *Lessons*; Eichengreen, *Golden fetters*; Almunia et al., 'From Great Depression'; Cloyne, Dimsdale and Postel-Vinay, 'Taxes and growth'. There is also a literature that argues that austerity had little effect on the course of the Great Depression, at least in the case of Britain; see for example Crafts and Mills, 'Rearmament'; eisdem, 'Self-defeating austerity'.

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more probable in countries where depressed economic conditions were allowed to persist because of inadequate policy responses.<sup>2</sup> The existing literature has put forward three main reasons to explain these policy mistakes: (1) the constraints of the Gold Standard (GS), (2) political unwillingness to resort to deficit borrowing, and (3) the inability to grasp the adverse effects of procyclical fiscal policies.

I show that an additional factor – the degree of fiscal capacity that countries possessed on the eve of the Depression – also determined the conduct of fiscal policy. A high fiscal capacity – that is, the demonstrated ability to raise substantial tax revenues, particularly from direct taxes – allowed countries to run more countercyclical – or, at least, less procyclical – fiscal policies and thus to avoid detrimental austerity.

My findings do not rule out a role for other factors, but rather complement them. GS adherence, while important, is insufficient to explain the wildly different dynamics of fiscal aggregates across countries. Inadequate knowledge and ideology clearly mattered, but are difficult to measure in practice, as is the degree to which they differed across countries. Differing degrees of fiscal capacity, instead, help to capture the dynamics of fiscal policy in a measurable and quantitatively significant way.

Why should fiscal capacity matter for fiscal policy? A well-established literature maintains that fiscal capacity is a fundamental ingredient in long-term development due to its role in state building and in the provision of public goods. In other words, fiscal capacity plays a key role in creating a high-quality institutional environment.<sup>3</sup> I show that a low fiscal capacity not only limits countries' long-term growth potential but also their manoeuvring space to deal with cyclical fluctuations in economic activity. This is because fiscal capacity links institutional quality to fiscal policy by way of access to borrowing. While borrowing has been linked to fiscal capacity in economic history before, there are no empirical studies connecting fiscal capacity directly to fiscal policies over the business cycle.<sup>4</sup> This paper helps fill this gap.<sup>5</sup>

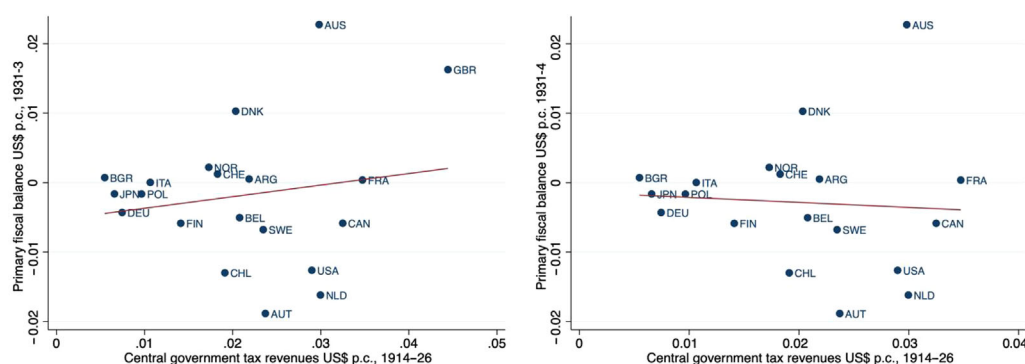
The crux of my empirical findings is displayed in figure 1, a simple scatterplot of my preferred fiscal capacity indicator – average tax revenues per capita for 1914–26 – vis-à-vis the fiscal policy stance indicator during the Depression – the average primary fiscal balance per capita in 1931–3. The left figure includes the 20 countries in my sample with data available for 1931–3, while the right one excludes the exceptional case of the United Kingdom, the most fiscally endowed country, which decided to pursue a conservative fiscal policy for ideological reasons. Once this outlier is removed, a negative relationship emerges between a higher fiscal capacity on the eve of the

<sup>2</sup> de Bromhead, Eichengreen and O'Rourke, 'Political extremism'.

<sup>3</sup> For comprehensive illustrations of the relationship between state/fiscal capacity and development see, amongst others: Epstein, *Freedom and growth*; Acemoglu, 'Politics and economics'; Besley and Persson, 'State capacity'; Dincecco and Prado, 'Warfare'; Hoffman, 'What do states do?'; Dincecco and Katz, 'State capacity'; Bardhan, 'State and development'; Dittmar and Meisenzahl, 'Public goods institutions'; Johnson and Koyama, 'States and economic growth'; Becker et al., 'Wars, taxation and representation'.

<sup>4</sup> Britain's exceptional ability to borrow, considering it being an advanced fiscal state, is the subject of an extensive literature; see North and Weingast, 'Constitutions and commitment'; Bordo and White, 'A tale of two currencies'; O'Brien, 'The nature'. More generally, Dincecco, 'Political regimes', has shown that European countries with centralized and/or constrained regimes – the two preconditions for effective, high-capacity states – enjoyed cheaper access to credit in the period 1750–1913.

<sup>5</sup> Some models have formalized the idea that the efficiency of tax systems endogenously affects creditworthiness and, thus, the ability to borrow (Aizenman, Gavin, and Hausmann, 'Optimal tax'; Arellano and Bai, 'Fiscal austerity'; Bi, Shen, and Yang, 'Fiscal limits'). Esslinger and Müller, 'State capacity', show that the relationship between capacity and borrowing can also go the other way.



**FIGURE 1** Fiscal capacity and fiscal stance during the Great Depression. *Notes:* See section IV for the data sources. ARG, Argentina; AUS, Australia; AUT, Austria; BEL, Belgium; BGR, Bulgaria; CAN, Canada; CHE, Switzerland; CHL, Chile; DEU, Germany; DNK, Denmark; GBR, the United Kingdom; FIN, Finland; FRA, France; ITA, Italy; JPN, Japan; NLD, the Netherlands; NOR, Norway; POL, Poland; SWE, Sweden; USA, the United States; p.c., per capita. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Depression and a more expansionary fiscal policy during the Depression itself. This relationship is confirmed using a rigorous panel data approach.<sup>6</sup>

In the analysis, I employ newly collected data for a panel of 22 countries – Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Chile, Colombia, Czechoslovakia, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Poland, Sweden, Switzerland, the United Kingdom, and the United States – the broadest possible sample for which I could find consistent data (figure 2). I proceed in two steps. First, I show that the fiscal capacity of countries – measured by indicators conventionally employed in the literature – allowed countries to run more expansionary fiscal policies, as captured by the evolution of the primary fiscal balance. Second, I explore the link between fiscal capacity and borrowing costs, finding that high fiscal capacity reduced bond yield spreads. However, I also find that this effect was short-lived and small. Therefore, it can only partially explain the overall effect of fiscal capacity, which, instead, was large and can be detected for most of the 1930s. I provide a very simple theoretical framework, which helps rationalize these results.

In addition to the empirical analysis, I support the argument that fiscal constraints mattered in the interwar period by discussing some prominent examples of fiscal reforms. I argue that these reforms were, at least in part, a reaction to the Great Depression, which had demonstrated that some countries' limited fiscal capacity had severely constrained their policy choices.

My findings resonate with work by Romer and Romer (henceforth R&R), who show that the degree of fiscal and monetary policy space on the eve of financial crises – proxied by public debts as a share of gross domestic product (GDP) and the distance of interest rates from the zero lower bound – is a crucial determinant of the use of macroeconomic policies during the crises themselves.<sup>7</sup> The idea of a constraint on policies determined by pre-existing conditions is, thus, common across this paper and R&R's. The difference, besides the fact that I only deal with fiscal policy, is that I focus on fiscal capacity rather than fiscal space.

<sup>6</sup> Removing the other outlier, Australia, would make the negative relationship substantially stronger, but there no clear a priori justifications to do so.

<sup>7</sup> Romer and Romer, 'Macroeconomic policy'.



The main reason for this difference is that R&R's work deals with advanced modern economies for which basic state capabilities are not in question. My work, on the other hand, deals with countries at a much lower level of economic and institutional development in the pre-Second World War period. In a context in which the very capabilities of the state are uncertain, fiscal capacity – as a proxy for the quality of the bureaucracy, the ability to monitor the economy, and other state capacities – may take precedence over fiscal space as a determinant of policy possibilities. My findings suggest not only that fiscal capacity was a determinant of the way countries conducted fiscal policies in the 1930s but also that its impact was distinct and more important than that of fiscal space.<sup>8</sup>

Besides the already cited literature, this paper speaks to two open debates in macroeconomics. First, it supports the hypothesis that borrowing constraints can contribute to damaging fiscal policy procyclicality.<sup>9</sup> Second, it suggests that the relationship between higher fiscal capacity and more countercyclical fiscal policies may help explain the negative correlation between government size and economic instability consistently found in post-Second World War data.<sup>10</sup>

The rest of the paper is structured as follows. Section I provides the background by discussing fiscal policies during the interwar period. Section II clarifies the concept of fiscal capacity, while section III provides a very simple theoretical framework outlining the role of fiscal capacity in the conduct of fiscal policy. Section IV outlines how fiscal capacity is measured and the new data I have collected, while section V illustrates the econometric modelling and identification strategy. Section VI discusses the results of the analysis. Section VII provides some examples of fiscal reforms in the interwar period, and section VIII concludes.

## I | FISCAL POLICY DURING THE GREAT DEPRESSION

In the interwar period, fiscal deficits, when at all present, tended to be very small, especially in comparison to the loss of GDP. In the United States, for example, the deficit was less than 5 per cent

<sup>8</sup> Moreover, in such a context, a low debt level may not be a good indicator of fiscal space, but simply a reflection of low fiscal capacity. Naturally, once capacity is accounted for, a lower debt may still be a useful proxy for fiscal space, but the codetermined nature of the ability to tax and to borrow makes this effect difficult to disentangle in practice.

<sup>9</sup> In the post-Second World War period, some developing countries have consistently implemented procyclical fiscal policies, which have contributed to higher macroeconomic volatility, welfare losses, and, potentially, lower long-term growth. On the relationship between fiscal policy and welfare loss, see Barro, 'Public debt'; Lucas and Stokey, 'Optimal fiscal and monetary policy'; Ferriere and Karantounias, 'Fiscal austerity'. On fiscal policies in developing countries see Gavin and Perotti, 'Fiscal policy'; Kaminsky, Reinhart, and Vegh, 'Procyclical capital flows'; Talvi and Vegh, 'Tax base variability'; Mendoza and Oviedo, 'Fiscal policy'; Ilzetzki and Vegh 'Procyclical fiscal policy'; Ilzetzki 'Rent-seeking distortions'; Frankel, Vegh, and Vuletin, 'On graduation'; Vegh and Vuletin, 'Tax policy'. On the relationship between fiscal policy, macroeconomic volatility, and growth, see Loyaza et al., 'Macroeconomic volatility'; Fatás and Mihov, 'Policy volatility'; Robinson, Torvik, and Verdier, 'Political economy'.

<sup>10</sup> This has been attributed to the combination of automatic stabilizers and composition effects (Gali, 'Government Size'; Fatás and Mihov, 'Government Size'; Andrés, Doménech, and Fatás, 'Stabilizing Role'). The argument for the latter is that the public sector is more stable than the private sector; therefore, countries with larger public sectors will be less volatile overall. However, the interwar period and modern developing countries (Mendoza and Oviedo, 'Fiscal Policy') demonstrate that a lower volatility in the public sector should not be taken for granted, given that fiscal aggregates can be more volatile than GDP. This paper's findings suggest that credit constraints in countries with weak and small governments can play an important role in fiscal policy procyclicality and volatility. Consequently, the ability of stronger governments to run more counter-cyclical and less volatile fiscal policies might help explain the negative correlation between government size and macroeconomic volatility.



of GDP in 1932, while the contraction of real GDP per capita was around 14 per cent. Moreover, US federal deficits in the early 1930s were mostly due to the lack of a political consensus on how to balance the budget, rather than a form of proto-Keynesianism, and were in any case compensated by surpluses at the state level.<sup>11</sup> This led to Brown stating that ‘Fiscal policy, then, seems to have been an unsuccessful recovery device in the ‘thirties not because it did not work, but because it was not tried’.<sup>12</sup> Even in Germany and Japan, countries that are sometimes seen as having embraced Keynesianism *ante-litteram*, the recovery of the 1930s was not driven by fiscal policy.<sup>13</sup>

The extremely limited use of fiscal (and monetary) policy led scholars to argue that governments’ responses to the Great Depression were gravely inadequate. Eichengreen highlighted the lack of international cooperation – fuelled by mutual suspicion – and the dominant conceptual framework – underpinned by the balanced budget ideology – as two key determinants of the weak policy responses to the Depression.<sup>14</sup> He further argued that the unwillingness to let go of the GS, seen by many as the last connection to the successful pre-First World War monetary order, constrained policies and piled further deflationary pressures and austerity on ailing countries. Temin similarly stated that the GS-imposed limitations to policy manoeuvring space were the fundamental channel for the spread of the Depression.<sup>15</sup>

But how much room for manoeuvre would countries have possessed had they been free from their ‘golden fetters’? What additional constraints did they face? On the fiscal side, many countries probably had limited possibilities to act.

One reason is that sources of finance for governments shrunk very quickly during the Depression. After 1929, international markets essentially dried up, and countries, which had experienced substantial capital inflows during the second half of the 1920s, experienced dramatic reversals and capital flight.<sup>16</sup> On top of this, financial domestic markets were underdeveloped in many parts of the world, and the legacy of the 1920s hyperinflations and the post-1929 collapse in asset prices had greatly reduced the wealth that governments could tap for domestic borrowing. Borrowing from central banks was an option for countries not on gold. However, large-scale money printing would probably have had major economic consequences in terms of further capital flight in the absence of stringent capital controls.

In addition to these factors, I argue that some countries faced a fiscal capacity constraint, which made it exceedingly difficult for them to avoid procyclical fiscal policies. I further argue that this constraint helps explain differences in the conduct of fiscal policy across countries. Despite the general evidence that fiscal policy was barely used to fight the slump, differences did indeed exist and were far from negligible, as shown in figure 1. Some countries successfully limited the procyclicality of their policy and even increased budget deficits during the slump, while other succumbed to stark austerity measures.

<sup>11</sup> De Long, ‘Fiscal policy’; Fishback, ‘US monetary and fiscal policy’.

<sup>12</sup> Brown, ‘Fiscal policy’, pp. 865–6.

<sup>13</sup> Ritschl, ‘Deficit spending’; Shibamoto and Shizume ‘Exchange rate adjustment’. Almunia et al., ‘From Great Depression’, offer a broad discussion of fiscal policies in the interwar period.

<sup>14</sup> Eichengreen, *Golden fetters*. Indeed, even for those potentially well disposed towards Keynesianism, the dogma of the balanced budget was hard to displace. The smoothing of the business cycle through fiscal and monetary policy was a radical notion even among economists in the Labour camp in the United Kingdom (Dalton, *Unbalanced budgets*), or among the Communists in France (Eichengreen, *Golden fetters*).

<sup>15</sup> Temin, *Lessons*.

<sup>16</sup> Accominotti and Eichengreen, ‘The mother of all sudden stops’.



## II | DEFINING FISCAL CAPACITY

The term ‘fiscal capacity’ – coined by Tilly – is usually used to indicate the level of development of a country’s fiscal system and, more broadly, its state capacity and ability to implement complex policies.<sup>17</sup> The theoretical and empirical literature linking fiscal capacity to economic development is vast and offers a wide array of potential channels.<sup>18</sup> As an example, Besley and Persson show theoretically that investments in legal and fiscal capacity are often complements.<sup>19</sup>

A high fiscal capacity, particularly when accompanied by effective restraints on the executive, is also indicative of an at least partly successful and functional bargain between state and society. Apart from facilitating the taxing of a non-negligible share of resources, cooperation between state and society can also promote the implementation and success of policies. Cooperation is particularly important in the historical context of this paper because of the quasi-voluntary nature of taxation which still prevailed in some countries – for example, Switzerland – in the interwar period.<sup>20</sup>

The link between taxation and institutional quality is reflected in the measurement of fiscal capacity. Tax revenues per capita, the share of total/direct taxes in GDP, and the share of direct taxes in total tax revenues are all widely used indicators. In the empirical analysis below, I rely on all these indicators finding similar results. The key insight is that the amount and types of resources the state is able to tax provide information on (1) the amount of revenue available to support the state’s infrastructure and policies, (2) the capability of the state, and (3) the level of cooperation of society. Direct taxes are a particularly good indicator of all three aspects because they rely on a broad tax base, they are some of the most demanding taxes to collect in terms of monitoring and fiscal infrastructure, and they require some consensus between the state and society for effective collection. At the other end of the spectrum are trade taxes. These are easy to collect, the tax base – goods entering and/or leaving the country – is easy to monitor and the political bargain with society more straightforward.

A further key message of the literature on state and fiscal capacity is that history matters. This is because fiscal capacity evolves slowly over time, for three main interconnected reasons. The first is technology. Some types of taxes – such as broad-based income taxes and value-added taxes – developed or spread across a substantial number of countries only recently. This is, at least partially, because the monitoring involved in raising these types of taxes became viable with improvements in the technology for the collection and processing of information.<sup>21</sup>

Second, given a certain technological level, some expansion of the state’s infrastructure (physical and otherwise) is often a necessary precondition for tax reforms. These investments are both costly and not instantaneously fruitful due to learning processes and the lag inherent in the creation of physical and human capital necessary for levying new taxes.<sup>22</sup>

<sup>17</sup> Tilly, ‘Reflections’; idem, *Coercion*; Rogers and Weller, ‘Income taxation’.

<sup>18</sup> See footnote 3.

<sup>19</sup> Besley and Persson, ‘State capacity’.

<sup>20</sup> Farquet, ‘Swiss tax haven’.

<sup>21</sup> See Genschel and Seelkopf, *Global taxation*, for a global overview of the factors affecting the introduction of new types of taxation. An aspect connected to technology is the structure of employment, which may facilitate or hinder the collection of direct taxation given a certain technological level. Jensen, ‘Employment structure’, for example, shows that the historical transition from self-employment to employee jobs can help explain the expansion of income taxation.

<sup>22</sup> For examples of the delay involved in levying new taxes; see Sylla and Wallis, ‘The anatomy’; Hansen, ‘Learning to tax’.





The third reason is political. Not only must the taxation technology have been developed/adopted and the tax infrastructure be in place, but a political bargain also needs to be reached for tax revenues to significantly expand. These obstacles to the expansion of fiscal capacity help explain why inefficiently weak states, unable to raise sufficient revenues and to provide growth and welfare-enhancing public goods, existed for vast stretches of human history and continue to exist today in many parts of the world.<sup>23</sup>

### III | FISCAL CAPACITY AND FISCAL POLICY: A SIMPLE THEORETICAL FRAMEWORK

Why and how fiscal capacity can affect the conduct of fiscal policy can be illustrated using an extremely simple theoretical framework. Consider the following government budget constraint in a two-period setting:

$$\tau_1 (1 + r) + \tau_2 = D (1 + 2r) \quad (1)$$

where  $\tau_1$  and  $\tau_2$  are lump-sum taxes in period 1 and 2, respectively, which can be negative and, in this case, a transfer to the citizens;  $r$  is the interest rate on borrowing/saving by the government; and  $D$  is the initial debt stock, which the government inherits at the start of period 1 and fully repays by the end of period 2. The timing of repayment of  $D$  is not key for the intuition of the model, but, for simplicity, assume that both the interest (for two periods) and the principal are fully paid in period 2. Note that  $\tau_1$  is multiplied by  $(1 + r)$  because any savings that the government makes in period 1 will yield  $r$  in interest in period 2, while conversely, any borrowing due to transfers to citizens will lead to interest payments. While the government can borrow/lend, citizens are credit constrained and thus hand-to-mouth; that is, they consume their income fully in both periods. Income  $Y_t$  is an endowment made up of a permanent component  $Y$  and a shock  $\varepsilon > 0$  hitting in period 1, such that consumption in periods 1 and 2 is  $C_1 = Y_1 = Y - \varepsilon - \tau_1$  and  $C_2 = Y_2 = Y - \tau_2$ , respectively. Assume further that the government cannot freely set  $\tau$ , but rather is constrained by its historically determined fiscal capacity  $\bar{\tau}$ , so that  $\tau_t \leq \bar{\tau}$ .

Normalizing population size to 1, the utility of each citizen  $i$  is a concave function  $u(\cdot)$  of consumption in period 1 and 2:

$$u_i = u(C_1, C_2) \quad (2)$$

Concavity means that citizens receive diminishing marginal utility from consumption in either period. They may thus like to smooth their consumption across periods but are unable to do so because they are credit constrained. The government will maximize citizens' utility through its policy tool taxes  $\tau$ . It can do so by borrowing from foreign investors with deep pockets and, thus, acting as a mediator between consumers and financial markets, allowing the former to smooth consumption intertemporally.

For a simple example illustrating what pushes the government to engage in intertemporal redistribution, let the utility function be a simplified Cobb–Douglas:  $u = C_1 C_2$ . Maximizing citizens

<sup>23</sup> Besides the already cited works, see also Acemoglu, Ticchi, and Vidigni, 'Emergence and persistence'; Besley and Persson, 'The origins'; Besley, Ilzetzki, and Persson, 'Weak states'; Besley and Persson, 'Why do developing countries'; Dincecco, 'The rise'.



utility subject to the budget constraint yields optimal taxes in the first period, as follows:

$$\tau_1 = \frac{D(1+2r) + (y - \varepsilon)(1+r)}{2(1+r)} \quad (3)$$

which indicates that  $\tau_1$  is a decreasing function of the negative income shock  $\varepsilon$  and an increasing function of the initial debt  $D$ . Given that a lower  $\tau_1$  means more intertemporal redistribution from period 2 to period 1, the mechanics are intuitive. First, the larger the initial debt stock is, the smaller the fiscal space to carry out the redistribution is. This is the fiscal space effect commonly discussed in the literature. Second, the larger the negative shock to income/consumption is in period 1, the more the government will want to redistribute from period 2 to period 1. The role played by fiscal capacity in this setting – or the fiscal capacity effect – becomes evident by rearranging the budget constraint so that  $\tau_1$  is a function of  $\tau_2$ :

$$\tau_1 = \frac{D(1+2r) - \tau_2}{1+r} \quad (4)$$

which indicates that the higher taxes can be in period 2, the lower they can be in period 1. The maximum possible taxation level  $\bar{\tau}$  determined by fiscal capacity puts a constraint on the degree of maximum possible redistribution, and this constraint is more likely to be binding for a larger income shock, that is, when the government wants to redistribute the most.<sup>24</sup>

The link between this framework and the empirical exercise in section IV is straightforward.  $D$  and  $\bar{\tau}$  are the debt and fiscal capacity levels that countries possessed on the eve of the Depression. In period 1, countries are hit by a large adverse shock: the Depression. The ability to smooth income and consumption through government borrowing and fiscal policy is constrained by both fiscal space and fiscal capacity.

A concern is that, unlike the initial debt level  $D$ , the maximum possible tax revenue of a country  $\bar{\tau}$  – that is, its fiscal capacity – cannot be observed directly. In line with the literature, I propose proxying this variable with observed taxation levels. Specifically, to avoid simultaneity between the explanatory and outcome variable (both of which contain tax revenues), I propose proxying fiscal capacity using pre-Depression taxation levels.

I argue that observed tax rates are a good proxy for fiscal capacity for two main reasons. First, as discussed in section II, countries need to invest resources to accumulate fiscal capacity. There is no reason for countries to invest in a capacity that they do not need or utilize. Moreover, although some institutional memory can persist, unused capacity is very likely to gradually disappear over time as both the know-how and physical infrastructure depreciate. Thus, observed fiscal capacity very likely reflects actual fiscal capacity closely. Using pre-crisis capacity levels is also consistent with the historical evidence, which shows that fiscal capacity develops slowly over time and can thus be assumed fixed in the short run and exogenous to the business cycle.

Second, and perhaps more importantly, from the point of view of those supplying credit to the government,  $\bar{\tau}$  is not known either. The demonstrated ability to raise a certain tax revenue is likely to be a more important factor for potential lenders than some unobservable maximum potential tax rate, which is furthermore subject to the practical and political difficulties involved in credibly committing to expanding tax revenues in the future.

<sup>24</sup> I am not the first to consider the ability to borrow to be bounded by a maximum tax rate. For more detailed theoretical treatments of the relationship between the efficiency of tax systems and creditworthiness, see Aizenman, Gavin, and Hausmann, 'Optimal tax'; Arellano and Bai, 'Fiscal austerity'; Bi, Shen, and Yang, 'Fiscal limits', amongst others.





Once one accepts observed taxation levels as a satisfactory proxy for fiscal capacity, another issue arises, namely over which time interval one should calculate the fiscal capacity indicators. Ideally, one would want an interval that is long enough to smooth out idiosyncratic and short-lived changes in taxation rates unrelated to underlying fiscal capacity. At the same time, one would want to reflect recent fiscal capacity, rather than capture a distant picture which may no longer reflect the current capability of the state.

I overcome the uncertainty regarding which time interval to use in calculating the fiscal capacity indicators by employing both a longer and shorter time interval. For the former, I employ all available observations on taxation levels for each country between 1914 (the earliest year in my dataset) and 1926 (the year before my empirical analysis starts).<sup>25</sup> For the latter, I employ only observations in the three years preceding the start of the analysis: 1924–6. Crucially, the results hold with both indicators, showing that the exact choice of years does not affect the ability of the analysis to capture the effect of fiscal capacity on fiscal policy.

It should be noted that the simple theoretical framework presented in this section rules out default, and all information is known to investors. The fiscal capacity/space effects manifest themselves in term of quantity of borrowing. In other words, investors will lend up to the amount that the borrowing government can pay back. There is no default risk affecting the interest rate.

One could expand the model by making the interest rate  $r$  a decreasing function of fiscal space/capacity. This would be justified in a setting where default risk is generated by some stochastic element (e.g. in the income-generating process of the country or in the decision-making process of the borrowing government regarding debt repayment), which fiscal capacity/space mitigate. In other words, if fiscal capacity/space reduced the probability of default in all states of the world, this would reduce risk and lead to a lower  $r$ . In turn, this would allow the government to borrow more. These mechanisms simply reinforce the main intuition of the theoretical framework, adding an unnecessary layer of complexity to the simple and intuitive theory provided. To put this in other words, a country chooses the amount it wants to borrow and is constrained by the amount it can repay, which is determined by fiscal capacity/space and the interest rate, which may or may not be affected by fiscal space/capacity itself.

Nonetheless, in the econometric analysis below, I consider this possibility of fiscal capacity/space affecting borrowing costs. I find that the effect of fiscal capacity on borrowing costs was both short-lived and quantitatively small, confirming that the effect of fiscal capacity manifested itself in the quantity of borrowing rather than in its price.

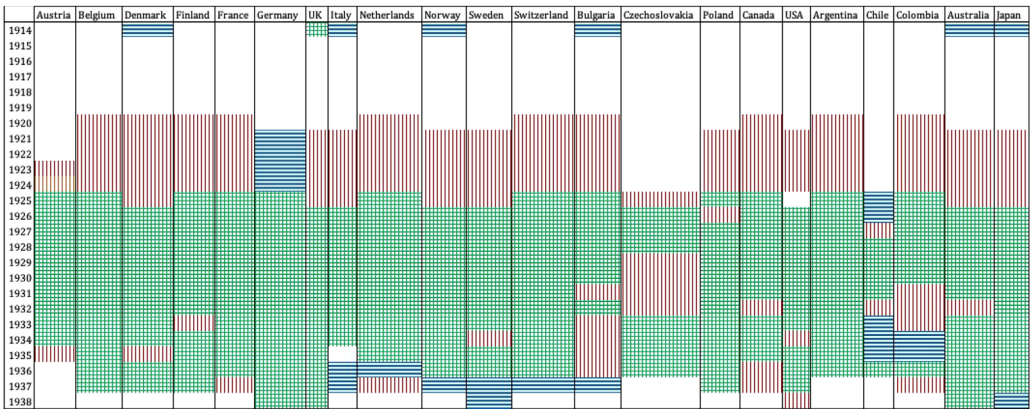
## IV | MEASURING FISCAL CAPACITY





Existing datasets on taxation and government expenditure in the interwar period are incomplete. Two sources that collected comparative data are Mitchell's *International historical statistics* volumes and the data handbook by [Flora, Kraus, and Pfenning](#).<sup>26</sup> The latter source, however, contains only data on Western Europe, while Mitchell's data contains substantial imprecisions, as well as poor documentation of the original sources used.<sup>27</sup>

<sup>25</sup> I start the analysis in 1927 to observe countries operating in pre-Depression conditions for at least two years and thus be able to compare fiscal policy in normal and crisis times. See section IV for a further discussion.

<sup>26</sup> [Mitchell](#), *International historical statistics*; [Flora, Kraus, and Pfenning](#), *State, economy, and society*.

<sup>27</sup> [Andersson](#), 'Financing the state'.



**FIGURE 2** Overview of data coverage. *Notes:* , Tax revenues; , government expenditure; , tax revenues and government expenditure; , not available; see section IV for data sources. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

To overcome the limitations of available statistics, I have transcribed data on the size and composition of 22 countries' central government tax revenues and expenditures for the period 1914–38 from various publications of the German Imperial Statistical Office.<sup>28</sup> The Office aggregated large amounts of data from the national statistical yearbooks of other countries, greatly simplifying the task of collecting it (see the [appendix](#) for details on the sources). The samples' composition is driven chiefly by data availability. However, it features most of the large market economies of the interwar era.

I focus on central governments for two main reasons. First, fiscal policy, like other public goods, requires coordination due to potential spillovers and free riding. Second, fiscal policy embeds an element of insurance from idiosyncratic risk across both time and space. Thus, the central government is the most appropriate unit of analysis to study cyclical fiscal policy. Despite these considerations, a more holistic view of public revenue and expenditure would certainly be valuable. Scattered and incomplete data pose a challenge that will require a further extensive data collection effort in the future.

Figure 2 illustrates available observations for tax revenues and expenditures for each country. While the data has some gaps, some of which could be filled using alternative sources, relying on a single source has the advantage of greater comparability across countries and over time, especially since the Office took steps to harmonize the series.

On the taxation side, [Andersson and Brambor](#) have undertaken a data collection effort that is comparable to mine.<sup>29</sup> The authors consider a longer time span and use different sources, but the composition of their sample for the interwar period is similar to mine. I confirm my results, using their data to calculate the fiscal capacity indicators in a robustness check (see the [appendix](#)).

Table 1 displays the newly collected taxation data synthesized in the fiscal capacity indicators that I use in the econometric analysis. The table contains information regarding overall tax revenue and direct taxes both in per capita terms – my favoured indicator of fiscal capacity in the context of the Depression era (see section V below) – and as shares of the GDP. I further present

<sup>28</sup> [Statistisches Reichsamt](#), *Statistisches Jahrbuch*; [idem](#), *Finanzen und Steuern*; [idem](#), *Statistisches Handbuch*.

<sup>29</sup> Andersson and Brambor, 'Financing the state'.

**TABLE 1** Central government tax revenues, 1914–26 average.

Country	Total		Direct		
	Current US\$ per capita	Percentage of GDP	Current US\$ per capita	Percentage of GDP	Percentage of tax revenues
Austria	24	8	7	2	30
Belgium	21	5	9	2	42
Denmark	20	5	8	2	35
Finland	14	7	3	1	22
France	35	8	13	3	38
Germany	8	2	3	1	17
United Kingdom	44	10	25	6	53
Italy	11	6	4	2	39
Netherlands	30	6	14	3	47
Norway	17	8	6	3	29
Sweden	24	6	7	2	29
Switzerland	18	3	5	1	24
Average for Western Europe	22	6	9	2	34
Bulgaria	6	7	1	2	23
Czechoslovakia	23	11	5	3	24
Poland	10	6	3	2	32
Average for Eastern Europe	13	8	3	2	26
Argentina	22	5	1	0	4
Chile	19	7	4	2	21
Colombia	5	5	0	0	4
Average for Latin America	15	6	2	1	10
Canada	33	6	6	1	19
United States	29	3	19	2	64
Average for North America	31	5	12	2	42
Australia	39	5	7	1	18
Japan	7	7	2	2	32
Overall average	20	6	7	2	29

*Note:* Author's estimates; values rounded up to the nearest integer. The taxation data are from Statistisches Reichsamt, 'Statistisches Jahrbuch', 'Finanzen und Steuern', and 'Statistisches Handbuch'; see the [appendix](#) for details. The nominal non-purchasing-power-parity adjusted GDP data used to scale the tax figures are from Klasing and Milionis, 'Quantifying', population is from Bolt and van Zanden, 'Maddison Project', and the exchange rates used to convert local currencies into US dollars are from the United Nations, 'Public debt'.



direct taxes as share of overall tax revenue. In the [appendix](#), I provide more historical context regarding interwar taxation by supplying a country-by-country and year-by-year illustration of the fiscal capacity indicators and discussing their dynamics over time. Additionally, I tackle some cases in more detail in section VII.

Direct comparisons across countries are imperfect due to differences in accounting standards – the problem is mitigated in the empirical analysis thanks to a panel data approach – but are nonetheless useful. The very low incidence of taxation by the standard of today's developed countries is immediately evident. Rich countries today tax around 40 per cent of GDP on average, while the average incidence of central government taxation between 1914 and 1926 was around 6 per cent.<sup>30</sup> These levels are comparable to those of low-tax developing countries today. These averages, however, mask stark differences in taxation levels both in per capita and GDP terms.

Regarding overall taxation, the high revenues of countries like the United Kingdom and France in this period stand in sharp contrast to much lower initial taxation levels in Germany, Switzerland, Finland, and Sweden, for example. Outside Western Europe, relatively low taxation levels in per capita terms, but high in GDP terms, characterized Eastern Europe, particularly Czechoslovakia. Thus, despite lower living standards, Eastern European countries managed to tax a relatively large share of resources. The same cannot be said of the Latin American countries in my sample. These exhibit relatively low tax revenues both in per capita and GDP terms; this is especially true for Colombia. This pattern has persisted, in relative terms, until today.<sup>31</sup> Japan also taxed relatively little in this phase. The rich European offshoots in North America and Oceania, instead, exhibit relatively high taxation levels in per capita terms, but low ones in GDP terms.

The information in the table indicates that Europe also stood out for large revenues from direct taxes, both in absolute terms and as share of GDP. As a share of total overall tax revenue, instead, direct taxes appear to be particularly high in North America and Japan. Latin America, is confirmed by this metric to have lagged severely in the development of its tax system, with the partial exception of Chile.

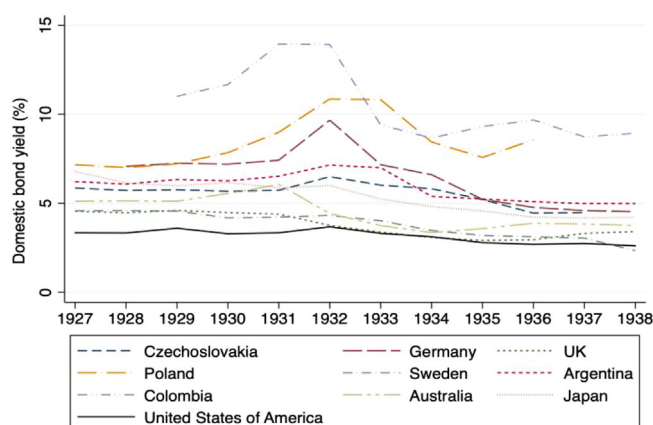
An important takeaway from the new data is that, despite telling a broadly similar story, differences exist across the three fiscal capacity indicators. For example, a generally higher tax revenue in Europe in per capita terms is partially mitigated by considering the size of the economy, or the overall tax revenue in the case of direct taxes. Using all three indicators in the empirical analysis below ensures that the complex and multifaceted nature of fiscal capacity is taken into consideration.

## V | EMPIRICAL STRATEGY

To estimate the effect of fiscal capacity on the conduct of fiscal policy during the Great Depression, I proceed in two steps. First, I investigate how fiscal capacity affected the primary fiscal balance, which is defined as tax revenues minus government expenditures, net of the public debt service. The debt service is excluded to purge the deficit of any expenditure not directed to the provision of goods and services or to transfers to the country's population. In other words, the primary balance is designed to capture the part of fiscal policy related to the smoothing of income (and consumption) over the business cycle, that is, my quantity of interest.

<sup>30</sup> The modern figure is from [Besley and Persson](#), 'Why do developing countries'.

<sup>31</sup> [Sokoloff and Zolt](#), 'Inequality'.



**FIGURE 3** Domestic public bond yields in selected countries, 1927–38.

Notes: For data sources, see footnote 31.

[Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Second, I study the relationship between fiscal capacity and borrowing costs measured using domestic bond yield spreads vis-à-vis the United States obtained from the League of Nations.<sup>32</sup> Yield spreads reflect borrowing costs relative to a baseline country of issue with very low or zero default risk.<sup>33</sup> The US yield is a natural choice as the baseline because the country's economic might and high level of financial development contributed to making it my samples' lowest domestic yield for most of the period under consideration (figure 3).<sup>34</sup> I focus on domestic financial markets for two reasons. The first is that the availability of data on domestic bond yields is greater than that of foreign ones. More importantly, the Great Depression all but froze international financial markets, making domestic credit the main source of government financing in the 1930s. In fact, the domestic share of the public debt increased from around 52 per cent in 1929 to over 78 per cent in 1938 for the countries in my sample.

For both dependent variables, I estimate the following equation:

$$z_{i,t} = \alpha + \sum_{t=1927}^{1938} \beta_t \text{Fiscal Capacity}_i \times l_t + x'_{i,t-1} \gamma + c_i + l_t + v_{i,t} \quad (5)$$

where subscript  $i$  identifies the country and subscript  $t$  identifies the year;  $z_{i,t}$  is the outcome variable (either the primary balance or the bond yield spread);  $x_{t-1}$  is the vector of controls;  $l_t$  and  $c_i$  are the time and the country fixed effects, respectively; and  $v_{i,t}$  is the idiosyncratic error term. Fiscal capacity is the main variable of interest, and its effect on the outcome is allowed to vary over time by interacting it with the time dummies. This effect is tracked by the  $\beta_t$  coefficients estimated for each year in the sample, except for 1929, which is the base year as the start of the Great Depression. I run the model for all available observations between 1927 and 1938.

The set-up is similar to that of a difference-in-differences (diff-in-diff) analysis. Instead of some units being treated at a certain point in time, as in a standard diff-in-diff, the hypothesis here is that the treatment – the degree of fiscal capacity – only matters – or matters more – in the presence

<sup>32</sup> League of Nations, *Statistical yearbook*. See the appendix for details on the specific bonds used in the calculations.

<sup>33</sup> Tomz and Wright, 'Empirical research'.

<sup>34</sup> See Basile, Landon-Lane, and Rockoff, 'Money and interest rates', for a thorough discussion of interest rates in the United States in the interwar period.



of an adverse shock like the Great Depression. Thus, I compare 'normal' and crisis years, with the theoretically justified hypothesis in mind that fiscal capacity matters most in the latter, when the demand for redistribution is highest and borrowing constraints are most likely to bind (section III). In other words, I expect differences in fiscal policy to only appear (or become more marked) after the Great Depression hits.

This approach also helps me to deal with the fact that fiscal policy needs to be evaluated in reference to the business cycle; that is, fiscal policy should ideally be countercyclical. An issue arises if one believes that fiscal policy influences the economy since said policy and economic activity will inextricably be linked in a two-way causal relationship. This means that, in the absence of an instrument unrelated to fiscal capacity, related to fiscal policy only through its effect on changes in economic activity, fiscal policy cyclicity cannot be measured directly in my setting. Given the enormous difficulty in identifying an instrument that satisfies the exclusion restrictions just outlined, my approach circumvents the issue by allowing me to compare the effect of fiscal capacity on fiscal policy during a single crisis event. The key is that the Depression was a global crisis affecting all countries with a similar timing. Thus, rather than measuring policy cyclicity directly, I infer it from the behaviour of my variables of interest over the business cycle caused by the Great Depression.

Of course, the Depression affected countries differently, and this may have led to a differential need to rely on fiscal policy. The analysis cannot account for this aspect of the episode, but as long as the depth of the Depression unrelated to fiscal policy was not driven by the degree of pre-existing fiscal capacity, my results will not be affected, except by potential attenuation bias due to measurement error.

Several other concerns arise in an analysis of the effect of fiscal capacity on fiscal policy. The first is related to the measurement of fiscal capacity. As already mentioned, in line with the literature, I employ tax revenues and direct tax revenues in my measures of fiscal capacity. Given that tax revenues also enter the dependent variable – the primary balance – measuring fiscal capacity contemporaneously to the primary balance would lead to a mechanical association between the two variables. Instead, I take fiscal capacity as predetermined by computing countries' average fiscal capacity in the years prior to the Depression, more precisely for the period 1914–26. However, calculating the fiscal capacity indicators over a different time interval does not meaningfully change the main results (see the [appendix](#)). As discussed above, the approach of keeping the capacity indicators fixed over the short run is consistent with my theoretical framework: the literature, which highlights that fiscal capacity only changes slowly over time, and the approach of R&R, who argue that pre-crisis policy space matters for the conduct of policy during the crisis itself.<sup>35</sup>

However, this approach raises an issue because changes in fiscal capacity occurring during the years of my analysis may affect the conduct of fiscal policy and, since they are not captured by the predetermined fiscal capacity indicators but are likely correlated with these, end up in the error term and bias my results. I tackle this possibility in two robustness checks presented in the [appendix](#). First, I end my analysis in 1934, reducing the risk that changes in fiscal capacity due to reforms undertaken during the Depression (I discuss several of these in section VII) had enough time to affect the conduct of fiscal policy. Second, as suggested by [Reed](#) for this type of setting, I instrument contemporaneous fiscal capacity with its own lagged values.<sup>36</sup>

<sup>35</sup> [Romer and Romer](#), 'Macroeconomic policy'.

<sup>36</sup> [Reed](#), 'On the practice'.





Another issue related to the measurement of fiscal capacity is the scaling of tax revenues to create the relevant indicators. In the baseline, I scale the tax revenues by population, thus rendering them in per capita terms. I do the same for the dependent variable: the primary balance. I also present results by scaling the direct tax revenues and the primary balance by the overall tax revenues, thus employing another commonly used fiscal capacity indicator.

A further option is to scale the variables by the size of the economy, which I exploit in a robustness check using the average GDP for the period 1914–26 as the denominator for the fiscal capacity indicators and the primary balance.<sup>37</sup> In this exercise, I find that, while the results are less clear-cut, the overall story is unchanged (see the [appendix](#)).

A further threat to identification comes from the fact that other characteristics of countries related to fiscal capacity may be driving fiscal policy. To reduce this possibility to a minimum, I control for factors traditionally associated with both fiscal capacity and fiscal policy, introducing them with a one-year lag.

First, I capture potential differences in the conduct of fiscal policy between more or less democratic countries, which are also likely to exhibit different levels of fiscal development.<sup>38</sup> To do this, I employ the polyarchy index from the Varieties of Democracy (V-DEM) database.<sup>39</sup> Second, I control for openness to trade using imports and exports as a share of GDP.<sup>40</sup> This variable accounts for the degree of vulnerability to external shocks, which also impacts tax revenue, as well as for the documented positive relationship between trade openness and government size.<sup>41</sup> Finally, I control for GS membership by including an ‘on gold’ dummy.<sup>42</sup> I consider countries to be off gold if they officially left the GS or introduced exchange controls, de facto leaving the GS. This allows me to account for the GS’s potentially important impact on borrowing capacity and borrowing costs as a ‘good housekeeping seal of approval’.<sup>43</sup> If, at the same time, GS adherence was correlated with fiscal capacity – because, for example, fiscally stronger countries found it easier to maintain the gold parity – not controlling for this variable would lead to bias. In addition, if GS membership constrained the policy options of its members, this would be reflected in dynamics of their primary balance, and this needs to be accounted for to avoid underestimating or overestimating – the direction of the bias will depend on whether fiscally stronger or weaker countries were more likely to remain on the GS – the impact of fiscal capacity.

<sup>37</sup> The GDP data, which come from [Klasing and Milionis](#), ‘Quantifying’, is in nominal non-purchasing-power-parity adjusted terms. As such, it is the ideal variable to scale other nominal variables, like tax revenues and the primary balance. The domestic currency variables are converted into dollars at the prevailing exchange rate before being divided by the nominal GDP.

<sup>38</sup> [Lane](#), ‘The cyclical behavior’; [Battilossi, Escario, and Foreman-Peck](#), ‘Fiscal policy responses’.

<sup>39</sup> [Coppedge et al.](#), ‘V-Dem’.

<sup>40</sup> [Klasing and Milionis](#), ‘Quantifying’.

<sup>41</sup> [Rodrik](#), ‘Why do more open economies’; [Epifani and Gancia](#), ‘Openness’.

<sup>42</sup> This is based on the dates summarized in [Crafts and Fearon](#), ‘Depression and recovery’.

<sup>43</sup> [Bordo and Kydland](#), ‘The gold standard’, and [Bordo and Rockoff](#), ‘The gold standard’, argue that, during the heyday of the classic gold standard (1870–1913), long-standing adherence to this international monetary system signalled the pursuit of orthodox policies, which significantly lowered borrowing costs. [Bordo, Edelstein, and Rockoff](#), ‘Was adherence to the gold standard’, find a similar effect for countries returning to gold in the 1920s, particularly if this was done at the pre-First World War parity. [Obstfeld and Taylor](#), ‘Sovereign risk’, confirm these results of the pre-First World War period, but not for the 1920s, for which they record the rising importance of debt burdens and British Empire membership. [Flandreau and Zumer](#), *Global finance*, and [Alquist and Chabot](#), ‘Did gold standard adherence’, instead, find that sound policies and common risk factors were more important than gold standard adherence even before the First World War.



The inclusion of country fixed effects allows me to further control for the vast array of time invariant and slow-moving country characteristics related to both fiscal development and the conduct of fiscal policy. As an example, I can capture differences between more and less economically developed countries. This is crucial, as economic development is very likely related to both the level of fiscal development and the conduct of fiscal policy. Finally, time fixed effects allow me to capture common shocks across countries, which might otherwise drive the results, that is, world-wide credit conditions. The panel estimation I carry out has a further advantage in this context, as it helps deal with issues of cross-country comparability of the data by exploiting the time series rather than cross-sectional variation of the variables.

Table 2 presents the summary statistics of the variables used in the analysis. Countries with wildly differing degrees of fiscal capacity, levels of economic development, political institutions, and fiscal policies are included in the analysis. Thus, the sample contains a large degree of variation, which allows for a meaningful analysis. As mentioned, the overall sample is made of 22 countries, and the 1927–38 sample used in the analysis is strongly balanced, despite some gaps in the data. The United States drops out of the analysis of the borrowing costs, as these are measured in relation to its bond yield, while Bulgaria drops out due to lack of data on bond yields for this period.

## VI | RESULTS

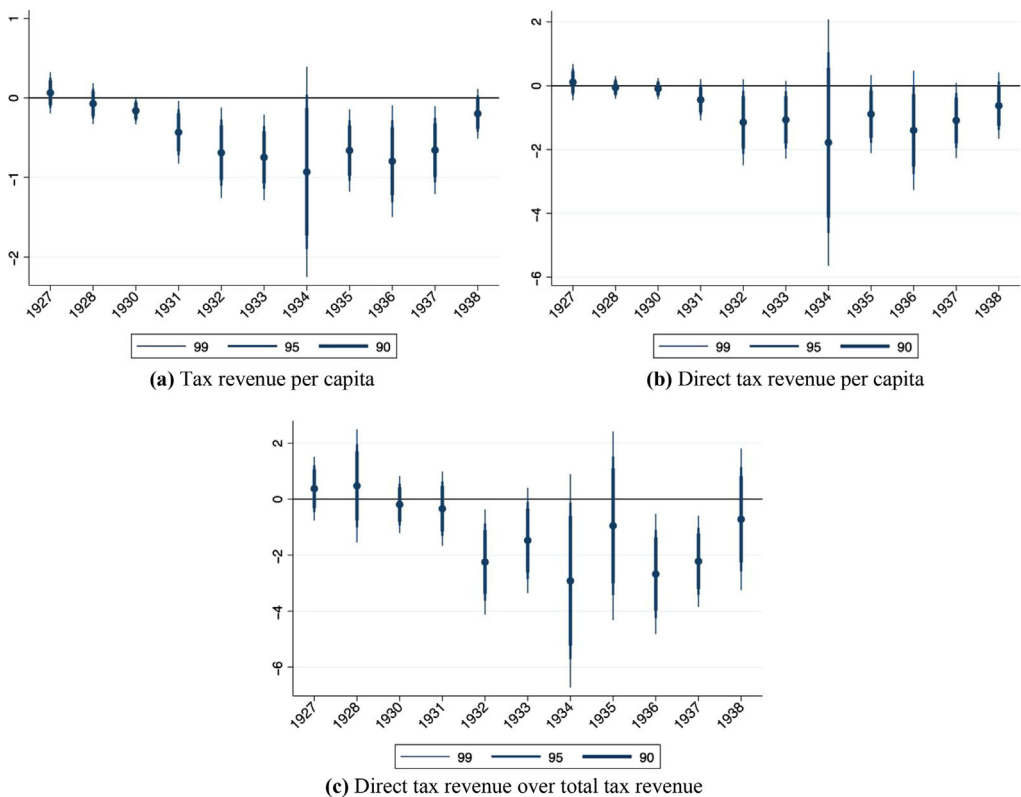
Having established the empirical approach, I present below the main results of the analysis. The [appendix](#) provides a variety of robustness checks, which show that my results hold when: (1) I exclude country fixed effects from the regression, thus exploiting the cross-sectional as well as the time-series variation; (2) I calculate the fiscal capacity indicators over a different time horizon (1924–6); (3) I use GDP as a denominator for both the fiscal capacity indicators and the primary fiscal balance; (4) I introduce a number of potentially important additional control variables, that is, a default dummy, the number of years the country spent at war in the period 1816–1913, population, land area, and per capita trade taxes; (5) I introduce the control variables contemporaneously instead of with a lag; (6) I run the regressions with no controls other than the fixed effects; (7) I run the analysis only for the most acute phase of the Depression, that is, until 1934; (8) I instrument contemporaneous fiscal capacity using lags of its own values; (9) I use an alternative dataset to calculate the fiscal capacity indicators; and (10) I drop a country at a time from the analysis to ensure no outlier is driving my results.

Figure 4 presents the key results of the paper: the estimates of the  $\beta_i$  coefficients and respective standard errors (clustered at the country level) from Equation (5). These coefficients capture the effect of fiscal capacity – as measured by the average tax revenue per capita between 1914 and 1926 in US dollars (US\$), the average direct tax revenue per capita between 1914 and 1926 in US dollars, and the average direct tax revenues as a share of overall tax revenues between 1914 and 1926, respectively – on the primary balance – either in US dollars per capita or as share of tax revenue, depending on the fiscal capacity indicator used. The results in figures 4a, b can be interpreted in a straightforward way since both the dependent and independent variable are in US\$ per capita. Specifically, the coefficients capture the effect of a US\$1 increase in the per capita tax revenue on the primary fiscal balance, also in US\$ per capita terms. The results in figure 4c are equally straightforward to interpret, as both the dependent and independent variable are expressed as a share of tax revenue. Thus, the coefficients denote the percentage point (pp) impact of a 1 pp increase of the share of direct taxes in total tax revenue.

**TABLE 2** Summary statistics.

Variable	Observations	Mean	Standard deviation	Min	Max
Primary balance sample (22 countries)					
Primary balance per capita (current US\$)	200	−0.158	12.825	−85.77	33.853
Primary balance/tax	200	−0.114	0.57	−1.909	1.237
Primary balance/GDP	200	−0.01	0.044	−0.271	0.066
Tax revenue per capita 1914–26 (current US\$)	200	20.645	10.552	5.017	44.433
Direct tax revenue per capita 1914–26 (current US\$)	200	7.377	6.313	0.191	25.199
Direct tax revenue/tax 1914–26	200	0.306	0.143	0.038	0.643
Tax revenue/GDP 1914–26	200	0.061	0.021	0.024	0.108
Direct tax revenue/GDP 1914–26	200	0.02	0.012	0.002	0.056
Public debt per capita 1914–26 (current US\$)	200	167.718	188.098	4.775	617.439
Polyarchy index	200	0.521	0.244	0.056	0.87
Trade/GDP	200	0.261	0.114	0.046	0.567
On gold	200	0.51	0.501	0	1
Default	200	0.105	0.307	0	1
Bond yield spread sample (20 countries)					
Domestic yield spread vis-à-vis United States percentage points	223	2.264	1.938	−0.27	10.61
Tax revenue per capita 1914–26 (current US\$)	223	20.943	10.16	5.017	44.433
Direct tax revenue/tax 1914–26 (current US\$)	223	6.796	5.62	0.191	25.199
Direct tax revenue/tax 1914–26	223	0.283	0.126	0.038	0.533
Polyarchy index	223	0.523	0.248	0.055	0.869
Trade/GDP	223	0.264	0.102	0.073	0.567
On gold	223	0.386	0.488	0	1

*Note:* See sections IV and V for sources.



**FIGURE 4** The effect of fiscal capacity on the primary balance, 1927–38. *Notes:* The figures depict the  $\beta_t$  coefficients from Equation (5) with the primary balance as the dependent variable. (a) The primary balance is in per capita terms, and the fiscal capacity indicator is the average tax revenue per capita for the period 1914–26; 200 observations were used, and 22 countries were included;  $R^2 = 0.6627$ . (b) The primary balance is in per capita terms, and the fiscal capacity indicator is the average direct tax revenue per capita for the period 1914–26; 200 observations were made, and 22 countries were included;  $R^2 = 0.6751$ . (c) The primary balance is measured relative to 1914–26 tax revenues, and the fiscal capacity indicator is direct tax revenue as a share of 1914–26 tax revenue; 201 observations were used, and 22 countries were included;  $R^2 = 0.7050$ . The thicker the lines, the lower the threshold for significance of standard errors clustered at country level, from 10% to 1%. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

The results for tax revenue (figure 4a) indicate that the degree of fiscal capacity made no difference to the conduct of fiscal policy before the start of the Depression. This is demonstrated by the coefficients close to zero for 1927 and 1928, which are, in addition, statistically insignificant. From 1930 onwards, the  $\beta_t$  coefficients increase in size in absolute terms, are negative, and are statistically significant until 1938. This means that, with the onset of the Great Depression, a higher fiscal capacity allowed countries to increase their primary budget deficits, that is, to run more countercyclical fiscal policies.

The results for direct tax revenue (figure 4b) tell a very similar story, the main difference compared with the results for tax revenue being that the coefficients for 1930 and 1934 are statistically insignificant at conventional levels. When I employ the direct tax share fiscal capacity indicator (figure 4c), it once again emerges that countries leveraged their fiscal capacity to run more countercyclical policies once the Depression hit. In this case, however, the result



emerges only in 1932, instead of 1930 or 1931, as is the case when the other two indicators are used.

The reason for this latter result is likely to be that using tax revenue as the denominator for the primary balance means that an increase in the primary deficit will be smaller in quantitative terms precisely in high-capacity countries (i.e. those with high tax revenues). Thus, for a statistically significant result to emerge, the increase in the deficit relative to 1929 must be larger than in the case in which the primary balance is measured in per capita terms. Despite this, even fiscal capacity measured in this way clearly mattered from the most acute year of the Depression – 1932 – and most of the rest of the decade.

The results are not only statistically significant but also economically relevant. A US\$1 increase in the per capita tax revenue increased the primary fiscal deficit from a minimum of US\$0.16 in 1930 to a maximum US\$0.93 in 1934. The average effect for the years in which the coefficient is statistically significant at the 10 per cent level (1930–8) is an approximate increase of US\$0.6 in the fiscal deficit. Thus, every extra dollar of taxation translates into a very substantial share going into fiscal deficits in the 1930s. The magnitude of the results can be further appreciated by considering that the per capita fiscal balance was on average in deficit over the same period (1930–8) by around US\$2.1 per capita.

The results for per capita direct taxes suggest an even stronger quantitative link between fiscal capacity and the primary deficit in quantitative terms. The effect of an extra dollar in direct taxes oscillates between a minimum of US\$0.4 in 1931 and US\$1.4 in 1936. The effect in 1934 is even larger (US\$1.8), but the standard error in this year is very large, so the result is not statistically significant at conventional levels. The average effect of a US\$1 increase in direct taxation for the years in which the coefficients are statistically significant is approximately a US\$0.9 increase in the primary deficit.

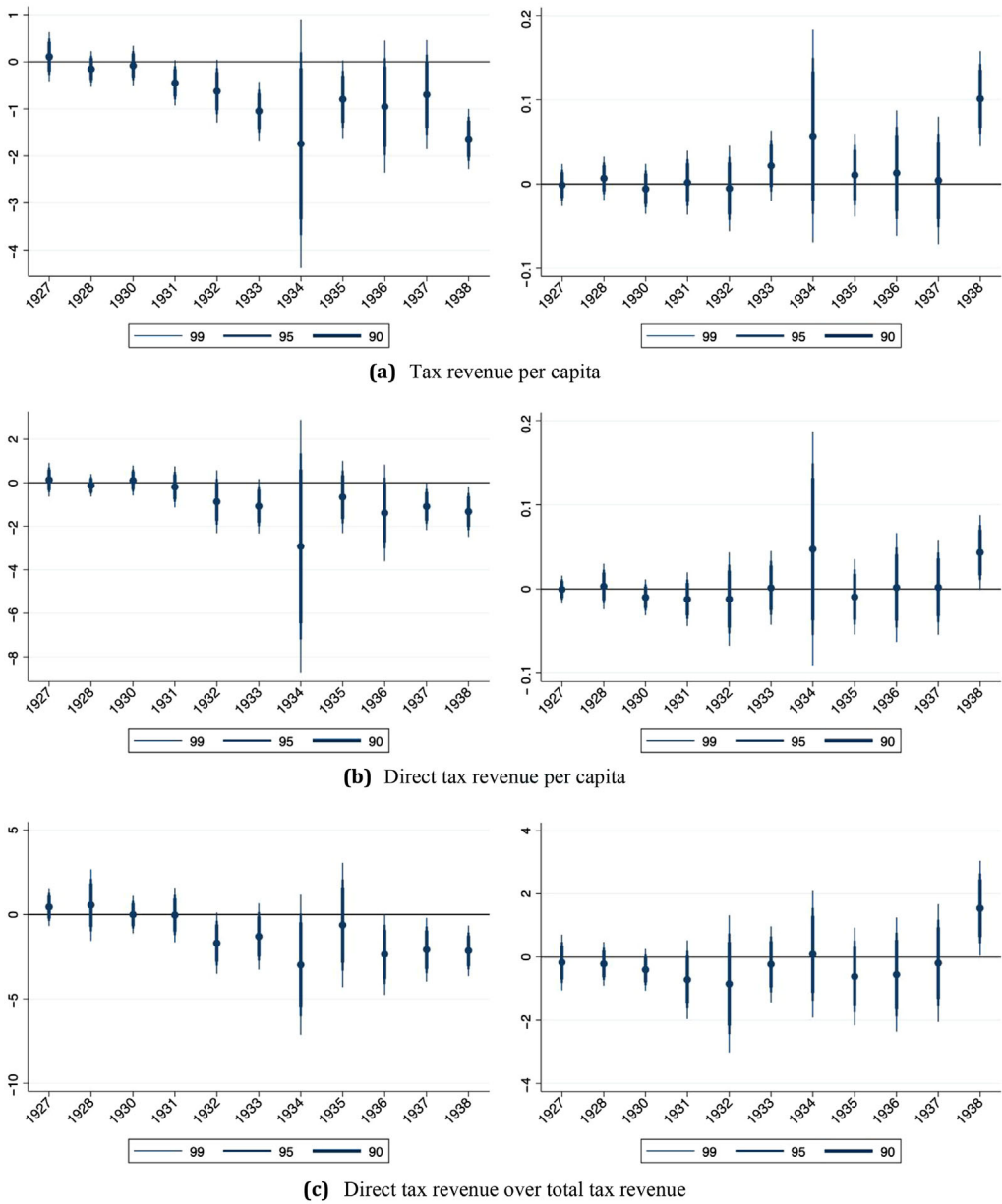
When both the direct tax revenues and the primary balance are expressed as a share of the overall tax revenue, the magnitude of the results is equally impressive. A 1 pp larger share of direct taxes in overall tax revenue is associated with a minimum 1.5 pp increase in the primary deficit (in 1933) and a maximum increase of 2.9 pp in the primary deficit (in 1934). The average effect for the years in which the coefficients are statistically significant at conventional levels is 2.3 pp.

As illustrated by the theoretical framework in section III, while fiscal capacity increases the fiscal room for manoeuvre, a higher initial debt level reduces it, all else equal. Empirically, this can be tested by extending Equation (5) as follows:

$$z_{i,t} = \alpha + \sum_{t=1927}^{1938} \beta_t \text{Fiscal Capacity}_i \times l_t + \sum_{t=1927}^{1938} \varphi_t \text{PubDebt}_i \times l_t + x'_{i,t-1} \gamma + c_i + l_t + v_{i,t} \quad (6)$$

where the  $\varphi$  coefficients will capture the effect of fiscal space on the conduct of fiscal policy.

Figure 5 illustrates the estimates of both the  $\beta$  and  $\varphi$  coefficients relative to 1929, as above, for the three fiscal capacity indicators. The estimates of the fiscal capacity coefficients are similar to those obtained using the previous specifications and tell the same story overall, but some differences do exist. Specifically, in a few instances the coefficients are no longer statistically significant, for example, in 1930 for the tax revenue capacity indicator. These differences are likely to be at least partially due to the fact that high-capacity countries also tended to have higher initial public debt, presumably thanks to their fiscal capacity or due to a common factor leading to the accumulation of both a large public debt and the development of fiscal



**FIGURE 5** The effect of fiscal capacity (left) and the public debt (right) on the primary balance, 1927–38. *Notes:* The figures depict the  $\beta_t$  (lefthand side graphs) and  $\phi_t$  (righthand side graphs) coefficients from Equation (6). (a) The primary balance per capita is the dependent variable, and tax revenue per capita 1914–26 is the fiscal capacity indicator; 200 observations were used, and 22 countries were included;  $R^2 = 0.6785$ . (b) The primary balance per capita is the dependent variable, and direct tax revenue per capita 1914–26 is the fiscal capacity indicator; 200 observations were used, and 22 countries were included;  $R^2 = 0.6930$ . (c) The primary balance as a share of tax revenue is the dependent variable, and direct tax revenue per capita 1914–26 is the fiscal capacity indicator; 201 observations were used, and 22 countries were included;  $R^2 = 0.6985$ . The thickness of the line denotes the level of confidence of the standard errors clustered at the country level. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]





capacity.<sup>44</sup> The positive correlation between fiscal capacity and the debt means that some of the effect of fiscal capacity may be captured by the latter variable, leading to smaller coefficients and larger standard errors.

The most important finding of this exercise, however, is that the public debt is hardly associated with the conduct of fiscal policy; in most instances, the  $\varphi$  coefficients are close to zero. This finding is consistent with the hypothesis put forward in this paper that fiscal capacity was more important than fiscal space in driving fiscal policy during the Great Depression. As mentioned, this is plausible in an historical context in which basic state capabilities were not guaranteed. In such a setting, the demonstrated ability of states to effectively collect substantial tax revenues and the more general capability this ability implied appear to have been more important in granting governments access to borrowing than the potential fiscal space countries possessed.<sup>45</sup>

Another potential explanation exists, however. Widespread defaults, and the consequently lower service on existing debts, may have increased the room for manoeuvre of previously highly indebted countries. This would justify the limited importance of initial debt burdens. To test this potential explanation, I re-estimate Equation (6), adding a sovereign default dummy.<sup>46</sup> If defaults were indeed responsible for increasing fiscal space, this variable should be associated with larger primary deficits, and its inclusion should restore the importance of debt burdens for the conduct of fiscal policy. However, the public debt coefficients in this exercise are essentially unchanged compared with the previous estimates, while the coefficient of the default dummy is small and statistically insignificant (see the [appendix](#)). These results may be explained by the fact that default, while lightening the debt burden, may have also restricted access to credit through reputational effects. In either case, these results confirm the greater importance of fiscal capacity compared with fiscal space in the conduct of fiscal policy in the interwar period.

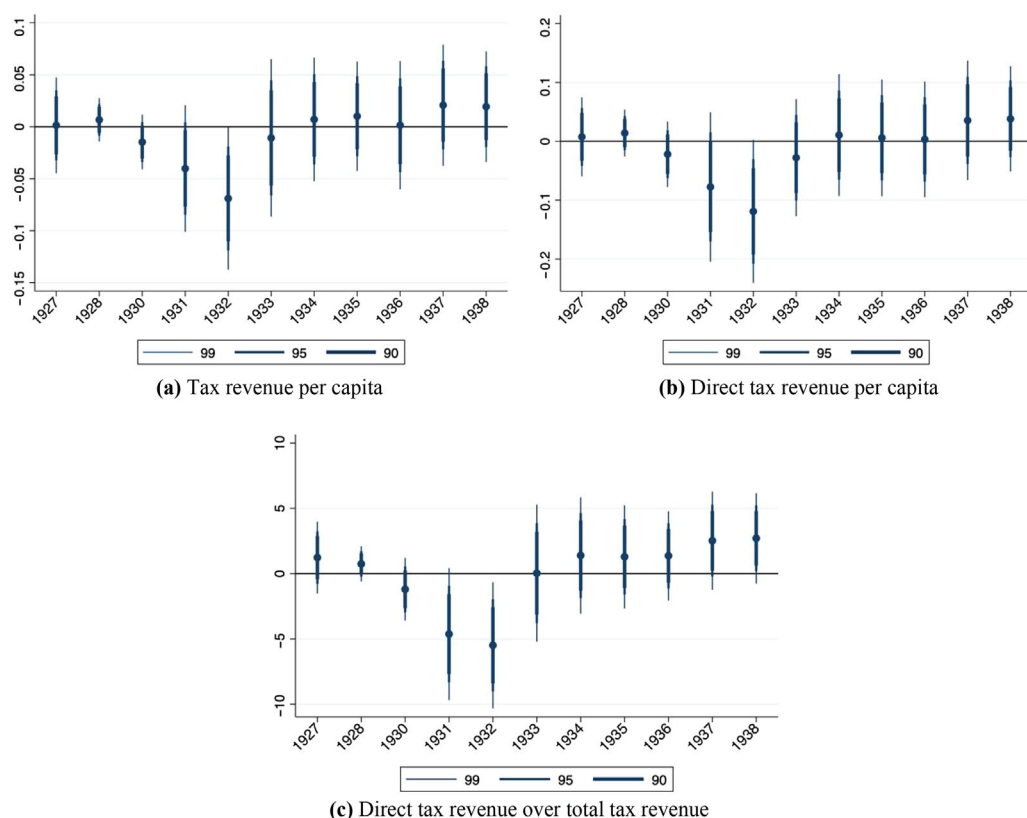
The  $\beta_t$  coefficients obtained by estimating Equation (5) with yield spreads as the dependent variable are illustrated in figure 6. These are once again computed relative to the base year 1929. The results show that high fiscal capacity led to a decrease in borrowing costs with the onset of the Depression. Thus, part of the effect of fiscal capacity on borrowing found above might be due to fiscal capacity lowering borrowing costs. However, this price effect cannot explain the entire impact of fiscal capacity on the conduct of fiscal policy.

As discussed above, the effect of fiscal capacity on the primary balance is present for most of the 1930s. The effect on the bond yield spread, instead, is temporally concentrated, being strongest in the most acute years of the Great Depression: 1931 and 1932. In 1933, the coefficient is still negative

<sup>44</sup> For example, war. It is no coincidence that two of the highest debt burdens in my sample are those of France and the United Kingdom, two high fiscal capacity countries, which had recently been heavily involved in the First World War and had also engaged in numerous conflicts during the nineteenth century. A large body of literature links war to the development of fiscal capacity. See, amongst others, [Brewer](#), *The sinews of power*; [Tilly](#), 'Reflections'; idem, *Coercion*; [Hoffman and Rosenthal](#), 'The political economy'; [Hoffman](#), 'What do states do'; [Centeno](#), *Blood and debt*; [O'Brien](#), 'The nature'; [Dincecco, Federico, and Vindigni](#), 'Warfare'; [Dincecco and Prado](#), 'Warfare'; [Dincecco](#), 'The rise'; [Dincecco, Fenske, and Onorato](#), 'Is Arica different'; [Gennaioli and Voth](#), 'State capacity'; [Sabat ](#) 'Does military pressure'; [Gupta, Ma, and Roy](#), 'States and development' and [Becker et al.](#), 'Wars, taxation and representation'.

<sup>45</sup> The practical and political difficulties involved in expanding tax revenues – and in credibly committing to expanding them in the future – seem to have made the demonstrated ability to raise substantial tax revenues also more important than a dimension of fiscal space other than debt levels, specifically having more room to increase taxes in the future due to lower initial tax levels.

<sup>46</sup> The sovereign default dummy comes from [Papadia](#), 'Sovereign defaults'. Default is defined as an interruption of the sovereign debt service and/or the repayment of the principal. The measure focuses on US\$ denominated commercial debt. As such, it excludes intergovernmental loans.



**FIGURE 6** The effect of fiscal capacity on the bond yield spreads, 1927–38. *Notes:* The figures depict the  $\beta_t$  coefficients from Equation (5) with the bond yield spread vis-à-vis the United States as the dependent variable. (a) The fiscal capacity indicator is the average tax revenue per capita for the period 1914–26; 223 observations were used, and 22 countries were included;  $R^2 = 0.8670$ . (b) The fiscal capacity indicator is the average direct tax revenue per capita for the period 1914–26; 223 observations were used, and 22 countries were included;  $R^2 = 0.8663$ . (c) The fiscal capacity indicator is direct tax revenue as a share of 1914–26 tax revenue; 223 observations were used, and 22 countries were included;  $R^2 = 0.8789$ . The thickness of the lines denotes the level of confidence of the standard errors clustered at country level. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

for the tax and direct tax per capita capacity indicators, but no longer statistically significant. The coefficients then become positive and mostly statistically insignificant until 1938. An explanation for this result may be that the initially lower borrowing costs were followed by greater borrowing and that this led to bond yields creeping back up (this, of course, assumes that borrowing costs are positively related to the public debt burden). Nonetheless, the fact remains that a higher fiscal capacity allowed countries to borrow more extensively throughout the 1930s, despite only a short-lived decrease in borrowing costs. This suggests that the mechanism based on quantity rather than price highlighted in the theoretical framework above is the crucial one, but a highly elastic credit supply curve may also have played a role.

Besides being shorter lived, the results for the bond yield spread are also quantitatively far less significant than for the primary balance. A US\$1 increase in tax revenue per capita is associated with a 0.07 pp decrease in the bond yield spread. Considering that the bond yield spread vis-à-vis the United States for countries in my sample was around 2.3 pp, this equates to a 3 per cent



decrease. The results are larger when considering direct taxes: a US\$1 increase in this tax revenue is associated with a 0.1 pp decrease in the yield in 1932, or approximately 5 per cent. When fiscal capacity is expressed in terms of direct revenues as a share of total tax revenue, the results are statistically significantly negative for 1931 and 1932, with an average decrease in the spread of 0.05 pp (2 per cent).

## VII | FISCAL REFORMS AFTER THE GREAT DEPRESSION

A further piece of evidence suggesting that fiscal capacity constraints mattered for countries in the interwar period are the fiscal reforms undertaken by several countries during or shortly after the Depression. I argue that these reforms were at least in part a response to the Depression's laying bare the constraints governments faced in the conduct of fiscal policy due to the underdevelopment of their tax systems.

A first useful example is that of the United States. The US federal government raised little revenue, especially relative to GDP, before the Depression. In this period, local governments played the main role in public finance. The New Deal introduced by Franklin D. Roosevelt in 1933, however, ushered in a new phase dominated by the federal system.<sup>47</sup> The Great Depression was the trigger in changing the political equilibrium, opening the way for a substantial increase in the fiscal capacity of the federal government.<sup>48</sup> Despite their diminished role in relative terms, states also expanded their taxation capability, particularly those hardest hit by the Depression. They did so at the expense of local governments, further underlining the trend towards fiscal centralization of this period.<sup>49</sup>

The US case also illustrates that fiscal reforms often take time to be implemented. In fact, the process of fiscal reform lasted for most of the 1930s and continued during the Second World War. This is particularly true for the income tax: at the federal level, revenue fell in 1929–33, and only subsequently rose, shooting up during the Second World War, with the reduction of personal deductions, increases in marginal rates, and the beginning of withholding.<sup>50</sup> Therefore, while the Depression put the United States on the path towards a higher fiscal capacity equilibrium, the unavoidable delays involved in building up fiscal capacity led to this being only a gradual process.

A second useful example is Germany. This case is more complex than that of the United States because of the country's political as well as economic unravelling in the early 1930s and because of the existence of war reparations, which complicated the political calculus around taxation. However, similar lessons to those of the United States follow from it.

During the Depression, Germany hit a credit constraint, which was due to both its previous extensive foreign borrowing and its limited fiscal capacity.<sup>51</sup> Despite the combination of spending cuts and tax increases introduced by Chancellor Brüning, Germany's fiscal situation did not improve, but rather worsened, as austerity backfired, contributing to the severity of the slump. With the fall of the Weimar Republic, the cancellation of reparations, sovereign default, and the rise to power of the National Socialist German Workers' Party (NSDAP), the political equilibrium

<sup>47</sup> Wallis, 'American government finance'.

<sup>48</sup> Wallis and Weingast, 'Equilibrium impotence'.

<sup>49</sup> Gillitzer, 'Do output contractions'; Coen-Pirani and Wooley, 'Fiscal centralization'.

<sup>50</sup> Wallis, 'American government finance'.

<sup>51</sup> Borchardt, 'Zwangslagen und Handlungsspielräume'; Ritschl, 'Reparation transfers'.



shifted in favour of a further expansion of central government's taxation. The result of this can be seen in the dramatic increase in the tax revenues documented in the [appendix](#). As in the United States, however, the build-up of fiscal capacity in Germany was gradual.

The same general conclusions hold for a country at a lower level of economic development: Argentina. The remarkable aspect of the Argentinian case is that the country introduced its very first income tax as a reaction of the Great Depression. When a provisional government was installed following the 1930 revolution, it set itself the task of reducing the country's reliance on custom duties and indirect taxes by increasing direct taxation from an extremely low starting point. The income tax was thus announced in 1931 and introduced in 1932 despite considerable political resistance.<sup>52</sup>

The impact of the new tax can be clearly seen in the dramatic increase of direct taxes in per capita terms, as well as a share of GDP and total tax revenues documented in the [appendix](#). Nonetheless, income taxation continued to play a considerably smaller role in Argentina compared with the more advanced European and North American fiscal systems, for the rest of the interwar period. Argentinian direct taxes also lagged those of fellow Latin American nation Chile, which had undergone its own deep fiscal reform already before the Depression hit.<sup>53</sup> Thus, the overall increase in Argentinian tax revenues, although impressive in relative terms, was modest in absolute terms and, once again, gradual.

The key message of these examples is two-fold. First, they show that the Depression provided a stimulus for deep fiscal reforms. Presumably this was because available fiscal resources proved gravely inadequate to deal with the crisis in several countries. Second, these examples confirm that fiscal reforms tend to take place over extended periods of time. It follows that fiscal capacity levels on the eve of the Great Depression were indeed a constraint on the policy choices available to countries once the crisis hit.

## VIII | CONCLUSION

This paper has investigated the impact of fiscal capacity on the conduct of fiscal policy in the interwar period. To the best of my knowledge, this is the first paper to do so. The analysis has shown that a higher degree of fiscal capacity led to substantially less procyclical fiscal policies, as captured by the dynamics of the primary balance over the course of the Great Depression. The results further indicate that fiscal capacity allowed countries to borrow more cheaply. This price effect, however, cannot fully explain countries' greater borrowing. The effect is quantitatively small and short lived, given that borrowing costs fell only during the most acute years of the Depression 1931 and 1932, while larger fiscal deficits lasted for most of the 1930s. The quantity of borrowing appears to have been the main policy lever influenced by fiscal capacity during the Great Depression.

Naturally, this work has not exhausted all avenues of research. Future work could more deeply explore the channels through which fiscal capacity operates thanks to in-depth country case studies, for example. Further work in this realm could also explore the relationship between fiscal capacity and fiscal policy cyclicity in other historical contexts, as well as in the present. This would require careful consideration of how to measure fiscal capacity, given that indicators used in my historical setting may not be suited to the contemporary context or the more distant past. Modern tax revenue data, for example, may need to be integrated with additional information

<sup>52</sup> [Alhadeff](#), 'Public finance'.

<sup>53</sup> [Lutz](#), 'Tax reform'.



regarding the amount of resources already committed to future expenditures (e.g. pensions), or information on tax evasion, to reflect the more complex workings of modern fiscal states. Historical studies may need to carefully consider what types of taxation best represent fiscal capacity and how vastly different accounting standards may affect comparative analyses.

Subnational governments could also be brought more systematically into the picture, though data availability will probably limit the scope of such work. More generally, additional studies highlighting the constraints under which countries operate in formulating their macroeconomic policies, which are often ignored both in research and in practice, would go a long way in advancing our knowledge of policy making both in the past and in the present.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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