Warfare, Fiscal Capacity, and Performance*

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Abstract

We exploit differences in casualties sustained in pre-modern wars to estimate the impact of fiscal capacity on economic performance. In the past, states fought different amounts of external conflicts, of various lengths and magnitudes. To raise the revenues to wage wars, states made fiscal innovations, which persisted and helped to shape current fiscal institutions. Economic historians claim that greater fiscal capacity was the key long-run institutional change brought about by historical conflicts. Using casualties sustained in pre-modern wars to instrument for current fiscal institutions, we estimate substantial impacts of fiscal capacity on GDP per worker. The results are robust to a broad range of specifications, controls, and sub-samples.

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JEL codes: C20, H10, O10, N40.

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1 Introduction

A large body of work places institutions that secure individual property rights at the forefront of economic development.[1] This view suggests that parliamentary limits on executives reduce tax predation and encourage private investment. The focus on predatory states, however, discounts the positive economic roles that governments may play. A more recent literature examines fiscal capacity, defined as the ability of states to raise tax revenues.[2] Non-state elites in less developed countries may resist fiscal control by central governments, leading states to underinvest in public services that improve worker productivity.[3]

This view receives support from the existing evidence. Political scientists find a close relationship between small fiscal capacity and lack of development in Africa, where traditional elite groups (bosses, chiefs, clan leaders, landlords, rich peasants) have consistently opposed tax reforms. The successful development experiences of Asian Tiger nations, by contrast, took place under powerful fiscal states.[4]

Nonetheless, we lack systematic estimates of the effect of fiscal capacity on economic performance. It is likely that wealthy economies choose or at least have the ability to choose strong fiscal systems. Economies that are different for a variety of reasons, moreover, may differ in terms of fiscal institutions and worker productivity.

To estimate the impact of fiscal capacity on performance, we need a plausible source of exogenous variation in fiscal institutions. In this paper, we relate current fiscal differences among countries to pre-modern wars, which we use to derive a possible source. We base our argument on the following premises. First, states fought different amounts of external conflicts, of various lengths and magnitudes. Second, to raise the revenues to wage wars, states made fiscal innovations. Economic historians claim that greater fiscal capacity was the key long-run institutional change brought about by historical conflicts. Third, the impact of past innovations on fiscal systems persisted to the present. We discuss our hypothesis at length and provide historical

[1] For theory, see Brennan and Buchanan (1980), North (1981), and Levi (1988). For empirics, see De Long and Shleifer (1993), Knack and Keefer (1995), and Acemoglu et al. (2001, 2002, 2005).

[2] See Acemoglu et al. (2004, 2011), Glaeser et al. (2004), Acemoglu (2005), and Besley and Persson (2008, 2009, 2010, 2011).

[3] For instance, Galor et al. (2009) show that concentrated landownership results in a lower tax rate and underinvestment in education.

[4] For Africa, see Migdal (1988), Herbst (2000), and Bates (2001). For East Asia, see Wade (1990) and Kang (2002).

evidence in Section 2.

Given these premises, we use measures of pre-modern wars as instruments for current fiscal systems. Not all conflicts, however, were created equal. Bigger wars required greater funds, and thus more fiscal innovations. Although military expenditures or government debts would be ideal measures of war magnitudes, systematic historical data do not exist. Given the lack of fiscal information that is available, any alternative indicator must provide a succinct measure of the scope of past conflicts that is comparable across countries.

Historical war casualties are one unique source of data that satisfy this condition. We compile a new database on total casualties for all major external conflicts from 1816 to 1913 in Western and Eastern Europe, North and Sub-Saharan Africa, the Middle East and Central Asia, the British Indian Empire, East and Southeast Asia and Oceania, the United States and Canada, the Caribbean, and South America from the statistical reference of Clodfelter (2002). This work is a comprehensive source of historical data on armed conflicts. For robustness, we compile a second database (also from Clodfelter, 2002) on total casualties for all major external conflicts from 1700 to 1788. As a further check, we construct a third instrument for the number of total battle-related deaths in major external conflicts from 1816 to 1913 from the Correlates of War database of Sarkees (2000). Finally, we construct controls for the total number of wars, years at war, and conflict types. We discuss our war casualty instruments at length in Section 4.

There is a strong positive relationship between current GDP per worker and pre-modern war casualties for our sample of 96 countries: states in the top decile of past war casualties are 80 percent more productive today than states with no recorded casualties.[5] We argue that this relationship reflects the effect of pre-modern fiscal innovations on current fiscal institutions. We test our claim by regressing current economic performance on current fiscal capacity, where we instrument for the latter by pre-modern war casualties. Our key measure of fiscal capacity is the share of total tax revenues from direct taxes (i.e., income, social security, payroll, and property taxes). We justify this choice in Section 3. As an alternative fiscal capacity measure, we also use the ratio of total tax revenues to GDP.

There is a strong positive first-stage relationship between pre-modern wars and

[5]The coefficient for the OLS regression of past war casualties on log GDP per worker is 1.03, with standard deviation 0.35, making it significant at the 1 percent level.

current fiscal systems: countries in the top decile of pre-modern war casualties have fiscal capacities that are 22 percentage points higher than countries with no recorded casualties.[6] Our two-stage least-squares estimates of the impact of fiscal institutions on performance are statistically significant and substantial. They imply, for instance, that raising Chad's fiscal capacity to the level of South Korea would more than double Chad's worker productivity.

The exclusion restriction that our instrumental variable regressions rely upon is that, conditional on the included controls, casualties sustained in pre-modern conflicts have no effect on current economic performance other than their impact on fiscal systems. We claim that our exclusion restriction is plausible. As described, economic historians argue that greater fiscal capacity was the key long-run institutional change brought about by historical wars. The cut-off year for our benchmark instrument, 1913, comes before World War I (1914-18), where prodigious casuality totals marked the start of the era of mass modern warfare and weapons of mass destruction (Clodfelter, 2002).[7] Furthermore, this cut-off is well before the post-World War II boom in social spending which established far-reaching government bureaucracies (Lindert, 2004). The large-scale participation of women in the (wartime) work force was also a post-1913 phenomenon. To further improve the plausibility of our IV approach, an alternative instrument measures war casualties for an even earlier era, from 1700 to 1788, the year prior to the French Revolution that marked the end of the Ancien Régime.

If other factors correlated with the estimates of pre-modern war casualties affect current performance, then the validity of our exclusion restriction is called into question. To show that omitted factors do not drive our findings, we test whether fiscal institutions have comparable effects on performance once we account for a large set of non-fiscal factors that may be correlated with pre-modern war casualties and current economic outcomes. The results are robust to controls for geography, country size, political inclusiveness, government size, trade openness, Great Power status, early technology, state antiquity, agricultural transitions, past wealth, legal and colonial origins, religion, fractionalization, and trust.

Although we control for a wide variety of non-fiscal factors, we cannot completely exclude the possibility that other variables are correlated with pre-modern war casu-

[6]The coefficient for the OLS regression of past war casualties on fiscal capacity is 0.21, with standard deviation 0.05, making it significant at the 1 percent level.

[7]It is for this reason that we refer to all pre-1914 conflicts as "pre-modern."

alties and current income per worker. Our investigation could also capture the effect of historical conflicts on performance through channels beyond fiscal institutions. To further evaluate the plausibility of the exogeneity assumption, we perform a sensitivity analysis. This exercise, which shows that our key findings are robust to moderate violations of the exogeneity restriction, reinforces the plausibility of our IV approach.

Our paper is related to the historical literature on warfare, state formation, and long-run growth, including Brewer (1989), Tilly (1990), Hoffman and Rosenthal (1997), O'Brien (2011a,b), and Rosenthal and Wong (2011). While standard theory assumes that governments are "born" with sufficient tax authority, economic historians study the evolution of fiscal capacity over time. Warfare, which encouraged fiscal innovations by states in order to raise greater revenues, plays a central role in such accounts. This literature, however, does not explore the links between past conflicts and current performance.

In this respect, the closest antecedent to our paper is the recent set of works by Besley and Persson (2008, 2009, 2010, 2011), which examines the relationships between conflict, state capacity, and growth over time. These works, however, are largely theoretical in nature. The literature still lacks a systematic analysis that rigorously examines the empirical relationships between wars, fiscal capacity, and long-run productivity differences.[8]

Finally, our paper is related to a number of works that study the linkages between historical factors and development, including Diamond (1997), Engerman and Sokoloff (1997), La Porta et al. (1998), Hall and Jones (1999), Acemoglu et al. (2001, 2002, 2005), Nunn (2008, 2009), and Ashraf and Galor (2012).[9] None of these studies, however, focus on fiscal capacity.[10]

The rest of the paper proceeds as follows. The next section describes our hypothesis and offers historical evidence. Section 3 presents OLS regressions of GDP per worker on our fiscal capacity measures. Section 4 describes our main instruments for fiscal capacity, pre-modern war casualties. Section 5 presents the 2SLS results, and Section 6 investigates the robustness of our findings. Section 7 concludes.

[8]Scheve and Stasavage (2010, 2012) test for the effects of mass warfare on tax reforms.

[9]Stylistically, our investigation hews closely to Acemoglu et al. (2001).

[10]One important exception is Bockstette et al. (2002), which investigates the economic impacts of early statehood. They find a strong positive link between state antiquity and current development.

2 Historical Background

We claim that pre-modern wars promoted fiscal innovations which persisted and helped to shape current fiscal institutions. In this section, we substantiate our hypothesis. We first discuss the relationship between warfare and fiscal change, and then examine channels of institutional persistence.

2.1 Warfare and Fiscal Change

Economic historians argue that the long-run impact of past military conflicts on public finances was fundamental. The physical destruction caused by warfare may have had a negative short-run effect on fiscal institutions. Over the long term, however, Brewer (1989), Tilly (1990), Hoffman and Rosenthal (1997), O'Brien (2011a,b), and Rosenthal and Wong (2011) argue that military competition promoted fiscal innovations that enabled states to raise ever larger tax amounts. These scholars view increases in fiscal capacity as the key institutional change brought about by historical conflicts.

The historical literature indicates that the capacity (or lack thereof) to raise wartime funds did not significantly affect decisions to fight. Hoffman and Rosenthal (1997) argue that the basic aim of early modern rulers was to wage war for royal glory and homeland defense. One key reason was the problem of royal moral hazard in warfare. In Hoffman's (2009, p. 24) words, monarchs

> overspent on the military and provided more defense than their citizens likely desired. But they had little reason not to. Victory... won them glory, enhanced reputations, and resources ... Losses never cost them their throne.

Specific historical examples further illustrate this phenomenon. Describing the Stuart kings of seventeenth-century England, Cox (2011, p. 133) writes:

> The Stuarts financed their wars largely with other people's money... If their wars went well, they repaid their debts out of the spoils of victory and pocketed the residual. Otherwise, they more often reneged. Thus, kings who could unilaterally launch wars faced a financial system that punished defeat too little and rewarded victory too quickly. The Stuarts were accordingly too quick to make war – and too eager to gamble on resurrection, when wars went badly...

Similarly, Keegan (1994, p. 348) characterizes early modern sovereigns in France as follows:

> The French fiscal system [was] overborne by the demands of incessant royal war-making through the eighteenth century... Warmaking... had always been costly, had bankrupted states before... The threat of bankruptcy through war-making had never yet, however, ushered in an entirely new philosophy of government.

The historical literature thus supports the claim that war participation drove fiscal capacity improvements, but that capacity constraints themselves did not significantly influence whether rulers went to war.

In Europe, the most widely studied region, fiscal change took place over centuries. Yet this process remained largely unfinished through the 1700s. Deep structural changes often occurred from 1789 onwards (Dincecco, 2009, 2011). Warfare was a key driver of institutional reform.[11] To finance its campaigns against France, for instance, Britain introduced a modern income tax in 1799. Although repealed in 1802, the tax was reintroduced the next year with the start of the Napoleonic Wars (1803-15). France also experimented with new taxes during the 1789-1815 period, as did the Austrian Empire, Belgium, the Netherlands, and Nordic states like Denmark, Norway, and Sweden (Aidt and Jensen, 2009). Overall, Dincecco (2009, 2011) finds strong relationships between the establishment of national tax systems around 1800 and increases in tax revenues.

A description of the implementation of the income tax during the nineteenth century further illustrates the links between warfare and public finances.[12] Denmark introduced temporary income taxation to finance its wars against Prussia in 1848-9 and 1864. During its successful war against Southern states (the Civil War, 1861-5), the U.S. government not only implemented a temporary income tax to fund military expenses, but also established the Internal Revenue Service for collection purposes. The Austrian Empire introduced a permanent income tax in 1849, at the time of the Austro-Sardinian War (1848-9). Similarly, Italy implemented an income tax in 1864, just after it fought the Franco-Austrian War (1859), and just before it fought the Austro-Prussian

[11] The long-run fiscal consequences of warfare may vary by context. For Africa, see Herbst (2000). For Latin America, see Centeno (1997).

[12] This account follows Clodfelter (2002) and Aidt and Jensen (2009). Also see Scheve and Stasavage (2010, 2012), who examine the linkages between nineteenth- and twentieth-century wars and progressive tax reforms.

War (1866). Finally, Japan established the income tax in 1887, the same year that the Meiji government defeated the ex-samurai in the large-scale Satsuma Rebellion.[13]

2.2 Channels of Persistence

There is a large literature that examines how economic and political institutions in history, ranging from the despotic empires in China, the Ottoman Empire, and Russia, to colonial structures in the New World, have shaped current institutional environments.[14] Once implemented, for instance, the income tax has generally become a fixed feature of the fiscal landscape.

There are several potential channels through which fiscal institutions may persist. We now describe two possibilities.[15] The first is that the establishment of strong fiscal institutions is costly. In Ancien Régime Europe, for example, there was a close relationship between local tax authority and political autonomy. Hence, traditional economic groups (nobles, clergy, residents of certain towns or regions) resisted state control. The implementation of national tax systems with uniform rates was often the result of "exogenous" shocks such as conquest by French Revolutionary or Napoleonic armies (Dincecco, 2009, 2011, Acemoglu et al., 2011). When new executives inherit strong fiscal institutions, they may wish to exploit them for their own purposes rather than cede authority back to traditional elites. On the Italian Peninsula after 1815, for instance, Dincecco et al. (2011) show that restored rulers retained the fiscal reforms first made by Napoleon, although they relinquished other ancient rights to local elites.

The second possibility is that, if states make irreversible investments that favor strong fiscal institutions, then they may be more willing to support them, leading to persistence. For instance, Hoffman and Rosenthal (2000) and Hoffman (2009) claim that the transition to nascent parliaments took place after 1800 due to a major shift in the nature of warfare that increased the penalties for defeated rulers. For the first time, leaders who failed in battle also faced the risk of losing their thrones. In turn, rulers and elites struck power-sharing bargains, whereby rulers received greater funds to wage wars, and elites (who coordinated efforts through national representative bod-

[13]Clearly, there are a wide variety of economic, geographic, legal, political, and social factors that may be correlated with both past wars and current economic performance. Our econometric analysis explicitly accounts for these factors.

[14]See Wittfogel (1957), Engerman and Sokoloff (1997), La Porta et al. (1998), Acemoglu et al. (2001), and Roland (2010).

[15]For further possibilities, see Besley and Persson (2011, chs. 2, 3, 5, 8).

ies) were able to finance a larger portion of the public services that they valued. Once executives have access to greater military resources, they may prefer to employ them to the state's advantage.

3 Capacity and Performance: OLS Results

3.1 Descriptive Statistics

Table 1 displays the descriptive statistics for the main variables of interest. The Data Appendix provides details about sources and construction methods. Our key measure of economic performance is output (GDP) per worker. There are large differences in performance across our set of 96 sample countries: output per worker in the top decile of productive countries is nearly 30 times higher than for countries in the bottom decile. As an alternative, we use total factor productivity from Hall and Jones (1999). Since the formal labor force is difficult to assess, this variable is less precise than output per worker.

Recall from Section 1 that we define fiscal capacity as the state's ability to raise tax revenues. To measure fiscal capacity, we use two different variables. Our key variable, shown in row 3, is the share of direct taxes (i.e., income, social security, payroll, and property taxes) in total tax revenues from the Government Financial Statistics database of the IMF. We average the tax data over the 1990s, because data from the 2000s were not always available.

There are two main reasons why we employ direct tax shares as our key capacity measure. Lindert (2004) argues that there are important similarities between the historical evolution of tax systems and current differences in tax regimes between rich and poor countries. The historical transition from tax systems was characterized by the shift from indirect taxes on trade and excises to those characterized by direct taxes. This shift, which was completed in rich democracies by the early twentieth century, led to significant reductions in the costs of tax collection. Fiscal regimes characterized by direct taxes are thus among the most efficient sorts of tax systems.

Furthermore, a defining characteristic of weak fiscal states is that they are unable to gather large tax amounts from traditional elite groups (see Section 1). The ability of governments to tax the assets, earnings, and savings of wealthy citizens is significantly higher in rich states: the average share of direct taxes for G7 countries, 0.76,

is nearly three times that of the seven least productive sample countries, 0.26.[16] The share of direct taxes is thus a key feature that distinguishes powerful fiscal states from weak ones.

As an alternative, we use a catch-all measure of fiscal capacity, the ratio of total tax revenues to GDP. Row 4 reports the descriptive statistics for this variable.

3.2 OLS Regressions

Table 2 presents ordinary least-squares (OLS) regressions of log output per worker against fiscal capacity for various specifications. The linear regressions are for the equation

$$\log(Y_i/L_i) = \alpha + \beta F_i + \boldsymbol{\gamma}'\mathbf{X_i} + \epsilon_i, \tag{1}$$

where Y_i/L_i is output per worker in country i, F_i is fiscal capacity, $\mathbf{X_i}$ is a set of controls, and ϵ_i is a random error term. We use the natural logarithm of worker productivity, since there is no theoretical motivation to favor levels over logs, and because logs facilitate the interpretation of our results. The use of productivity levels as the dependent variable, however, did not alter the findings in any significant way. Throughout our investigation, the coefficient of interest is β, the effect of fiscal capacity on output per worker. We always include continental dummies for Africa, Asia, and Latin America according to Persson and Tabellini (2003, ch. 3).

Column 1 indicates that there is a significant positive correlation between direct tax shares, our key measure of fiscal capacity, and GDP per worker. Figure 1 depicts this relationship graphically. To provide a sense of the magnitude of the impact of fiscal capacity on performance, we compare Chad, which falls in roughly the 25th percentile of the direct tax share measure, 0.30, with South Korea, which falls in roughly the 50th percentile, 0.46. The column 1 estimate, 3.83, indicates that GDP per worker for South Korea should be nearly twice as large as that for Chad. In reality, this output gap is roughly 14-fold, which means that, if the impact estimated in Table 2 was causal, then the effect of fiscal capacity on productivity would be substantial, but still notably less than the true Chad-South Korean output difference.[17]

[16] The G7 countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. The seven least productive are Bhutan, Burundi, Chad, the Democratic Republic of the Congo, Madagascar, Myanmar, and Rwanda.

[17] Naturally, a variety of factors beyond fiscal capacity also influence performance (e.g., Hall and Jones, 1999).

Climate is often thought to directly affect productivity. To control for this factor, we include absolute latitude as a regressor in column 2. The coefficient on fiscal capacity falls, but only slightly. Latitude is also significant, and has the positive sign suggested by past work. The inclusion of a squared latitude term does not significantly alter these results.[18] Finally, note that the continental dummies capture broad geographical factors beyond climate.

Theory predicts that political inclusiveness influences government size and hence fiscal capacity (Persson and Tabellini, 2000). Column 3 includes a measure of democracy, and column 4 a measure of government size.[19] The findings are similar in magnitude and significance to those in column 2. Democracy has a positive significant performance effect, while the effect for government size is negative but not significant.

Trade openness implies that indirect tax revenues from tariffs will be low. Ceteris paribus, revenues from direct tax sources should thus be higher. Free trade may also have a positive income effect, increasing overall tax revenues. For these reasons, openness may affect direct tax shares, our main fiscal capacity measure. To control for trade impacts, column 5 includes a measure of openness.[20] Our results remain similar as before. Trade has a significant positive productivity effect.

Column 6 adds the variables for latitude, political inclusiveness, government size, and trade openness simultaneously. The findings for fiscal capacity are unaltered. Now government size has a significant negative performance impact, while the impact for democracy remains positive but is no longer significant. The trade effect remains positive and significant.

Column 7, which restricts the sample to non-OECD countries, indicates that rich countries do not drive our results. By contrast, the magnitude of the coefficient on fiscal capacity falls notably (although it is still significant) when using OECD countries alone. This finding concurs with the literature on weak fiscal states which argues that underinvestment in basic public services primarily occurs in emerging economies (see Section 1). Once countries reach a certain development threshold, such as the shift from non-OECD to OECD status, the importance of further fiscal improvements

[18] As an alternative, we used a dummy variable for tropical countries. The key result was unchanged.

[19] Due to the lack of a plausible instrument, we treat democracy as exogenous. However, we were able to treat government size as endogenous and use distance to major exporters and population as instruments according to Rodrik (1998). Our main estimate was unaffected.

[20] We also treated trade openness as endogenous and used the instrument from Frankel and Romer (1999). The key result was unaltered.

appears to diminish.[21]

Column 8 repeats our baseline regressions using the ratio of total taxes to GDP as an alternative measure of fiscal capacity, and column 9 replaces our dependent variable, GDP per worker, with the TFP measure from Hall and Jones (1999). In each case, the effect of fiscal capacity on economic performance remains positive and highly significant.

In total, the Table 2 findings display a strong correlation between our measures of fiscal capacity and worker productivity. There are two key reasons, however, why we should not interpret this relationship as causal. To start, there is a problem of reverse casuality: wealthy economies may choose, or at least may afford, stronger fiscal systems. Second, there are omitted factors that affect both fiscal institutions and economic performance. We would expect these problems to positively bias the OLS estimates. On the other hand, if our capacity measures are noisy, and do not correspond well with the greater cluster of economic and political institutions that influence actual productivity levels, then there may be a negative attenuation bias to the OLS estimates. To address these problems, we need a plausible instrument for fiscal capacity. Our instrument must account in a significant way for the observed variation in fiscal institutions, but have no direct impact on productivity. As described in Sections 1 and 2, we claim that casualties sustained in pre-modern wars are plausible instruments.

4 Pre-Modern War Casualties

To wage bigger wars, historical states required greater revenues, and thus more fiscal innovations. A key issue is how to measure past conflicts. By treating all conflicts as equally sized, the use of binary indicators to compute the share of years that a sample country fought external conflicts masks large differences in war magnitudes. Comprehensive historical data for fiscal variables such as military expenditures or

[21] Although a recent literature argues that higher taxes in Western Europe help account for the shortfall in GDP per worker relative to the United States (Prescott, 2004, Ohanian et al., 2008), our results do not reveal any negative productivity effects of greater overall fiscal capacity. When fiscal capacity is high (e.g., at OECD-country levels), however, there is reason to think that different tax compositions may influence productivity levels. For instance, Hines and Summers (2009) argue that the forces of globalization are likely to lead to an increase in consumption-style taxes in rich countries like the United States.

government debts, moreover, are not available.[22]

War casualties are one unique source of information that provide a succinct, comparable measure of the magnitude of past conflicts. Our data are from Clodfelter (2002), whose statistical compendium is a comprehensive historical source for armed conflicts. The nineteenth-century data span Western and Eastern Europe, North and Sub-Saharan Africa, the Middle East and Central Asia, the British Indian Empire, East and Southeast Asia and Oceania, the United States and Canada, the Caribbean, and South America. To form our benchmark instrument, we computed the number of total casualties sustained by state armed forces in major external conflicts listed as wars, wars of independence, conquests, and campaigns from 1816 to 1913 for each sample country.[23] Table 3 displays the names, years, participants, and coalitions of these conflicts, of which there are 141, by geographical category. We describe key aspects of this database throughout this section. The Data Appendix provides further details.

Our 2SLS regressions rely upon the exclusion restriction that, conditional on the included controls, casualties sustained in historical conflicts have no effect on current economic performance other than their impact on fiscal systems. We argue that our exclusion restriction is plausible for the following reasons. First and foremost, economic historians claim that greater fiscal capacity was the key long-run institutional change brought about by historical wars (see Section 2). Furthermore, the cut-off year for our benchmark instrument, 1913, is before World War I (1914-18), when enormous casuality totals signaled the onset of the era of mass modern warfare and weapons of mass destruction. Our instrument thus concerns wars from the "pre-modern" military age. In Clodfelter's (2002, p. 479) words:

> The count of casualties took a quantum leap in the Great War. Battle losses of World War I were totally unprecedented in human history. Even the greatest battles of the seventeenth and eighteenth centuries in Europe . . . paled besides those of World War I when counting numbers engaged and fallen.

[22]There is also a conceptual reason to focus on state revenues rather than debts. The historical literature indicates that the state's ability to borrow wartime funds was typically an outcome of, but not a substitute for, its capacity to raise new taxes and thereby repay interest on loans. For instance, O'Brien (2011a, p. 430) argues that England's status as the dominant fiscal state enabled it to accumulate very large war-related debts over the seventeenth to nineteenth centuries.

[23]The fact that there were fewer European-based wars over the 1816-1913 period (called "Pax Britannica") relative to previous eras (e.g., the tumultuous eighteenth century prior to 1789, or the French Revolutionary and Napoleonic Wars from 1792 to 1815) should reduce the impact of European warfare on our results. Also see Section 6.

In addition, the 1913 cut-off is well before the post-1945 boom in social spending that established far-reaching government bureaucracies. Lindert (2004) argues that military expenditures dominated state budgets through the start of the twentieth century, and that there was little spending on social programs of any kind. New funds generated by wartime fiscal innovations were often put toward greater defense expenditures. Moreover, the large-scale participation of women in the work force brought about by warfare (e.g., "Rosie the Riveter" during World War II) was a post-1913 phenomenon. It is thus unlikely that pre-modern wars influenced female labor market participation. Our IV analysis also controls for a large set of non-fiscal factors that may be correlated with pre-modern war casualties and current economic outcomes.

To further improve the plausibility of our IV approach, we used Clodfelter (2002) to compile an alternative database for an even earlier era. These data cover all major external conflicts from 1700 to 1788, the year prior to the French Revolution which marked the end of the Ancien Régime.[24] The key disadvantage of the eighteenth-century database is that it is less expansive. While Clodfelter documents external conflicts for 11 geographical designations from 1816 to 1913, there are only six such designations for the 1700s. However, the eighteenth-century data are useful as a robustness check since they are set farther back in history and are thus even less likely to have any direct effect on current economic performance.

As an additional check, we constructed a third instrument for the number of total battle-related deaths sustained by state armed forces in major external conflicts fought in Africa, Asia, Europe, the Middle East, Oceania, and the Western Hemisphere from 1816 to 1913 from the Correlates of War (COW) database of Sarkees (2000). While this data source is valuable, the Clodfelter (2002) data better fit the particular demands of our analysis. Since it starts in 1816, we cannot use the COW database to document eighteenth-century wars. For the 1816-1913 period, the Clodfelter data include 141 wars in total, while the COW database only includes 114, a difference of nearly 30. Finally, unlike the COW database, Clodfelter's individual war summary descriptions allow us to account for some modern states by way of historical predecessors. The Data Appendix describes these details. For instance, we counted casualties in wars fought by the Gurkha Kingdom for Nepal and those in wars fought by the Kandy Kingdom of Ceylon for Sri Lanka. The Clodfelter data thus enable us to develop a

[24]To reduce the effect of European warfare on our findings, we exclude the French Revolutionary and Napoleonic Wars (1792-1815).

more comprehensive set of pre-modern wars than the COW data in these regards. However, the COW data are still useful as a robustness check.

Comprehensive historical data for country size are not available. To account for size differences, we scaled the war casualty figures by square kilometers of current territory. Many sample countries were characterized by relatively stable borders from the nineteenth century onwards. Most other sample countries only experienced small net changes in physical size. Scaling by area is thus far more accurate than scaling by population, which experienced significant fluctuations over time, in some cases as a result of warfare. Furthermore, there is a dearth of yearly country-level population data prior to World War II. We claim that scaling by area is much better than scaling by population for these reasons. To explicitly account for country size, we always include area as an additional regressor in the 2SLS regressions. Finally, we recognize the concern that arises if we do not take past population density into account, since past density may be linked with past economic success, which gave rise to both larger historical wars and higher current incomes. We control for past population density (and past economic success more generally) in Section 6.

Table 4 displays the summary statistics for the pre-modern war casualty data. External conflicts led to an average of 0.10 total casualties per square kilometer of territory from 1816 to 1913. Bulgaria experienced the most (scaled) casualties, at 1.51 per square kilometer. Relatively more wars were fought during the eighteenth century. External conflicts led to an average of 0.20 total casualties per square kilometer of territory from 1700 to 1788. The Netherlands experienced the most (scaled) casualties, at 3.36 per square kilometer, over this era. Finally, according to the COW database, which measures total battle-related deaths, the 1816-1913 average was lower than the Clodfelter one, at 0.06 military deaths per square kilometer. Here Slovenia experienced the most (scaled) casualties, at 1.06 per square kilometer.

War patterns beyond casualty totals may also matter. Participation in one large conflict per era could have had different fiscal implications than participation in several small conflicts, even if the total number of casualties was similar across both cases. Furthermore, countries that participated in more conflicts could have benefited from "learning by doing," which would imply that casualties fell with greater war experience, even if fiscal capacity grew. The level of substitutability between soldiers and weaponry could have also been important, since a smaller force with skilled personnel or advanced technology could have been more effective than a large but badly

equipped one, influencing war casualties and fiscal requirements alike. Finally, winning or losing conflicts could have had diverse effects on war casualties and public finances.

To control for war patterns, we computed both the total number of wars and the total years at war for each sample country from 1816 to 1913. Since some countries fought multiple conflicts per year, total war years could exceed 97 (i.e., 1913 minus 1816). Table 4 indicates that sample countries participated in an average of 3.57 wars over this period, with an average of 15 years at war. The United Kingdom fought the most external conflicts, at 43, and during the most years, at 121. The UK also experienced very large casualties in both scaled (0.60) and absolute (146,254) terms and was the world's most dominant fiscal state (Brewer, 1989, O'Brien, 2011a). Furthermore, there are strong positive relationships between the number and length of wars, casualties, and fiscal strength for the four other historical Great Powers.[25] These correlations are consistent with the leading narrative in the historical literature about warfare and fiscal strength (see Section 2). They suggest that, although concerns about learning-by-doing and substitutability between soldiers and weaponry are noteworthy, the hypothesized positive relationship between war magnitudes as measured by casualty totals and past fiscal innovations will hold.

Conflict type is another war characteristic that we must consider. Recall that our benchmark instrument includes wars, wars of independence, conquests, and campaigns. Independence wars could be of particular concern, since the 1816-1913 period includes the establishment of new nations in Latin America and elsewhere. Nascent states often had large debt levels after independence wars, which could have had negative development effects due to the sheer amounts to be repaid and the potentially onerous repayment terms themselves. Furthermore, war casualties could be endogenous, since past institutional structures and income levels not only affected the occurrence and magnitude of independence wars (and thus the casualty numbers themselves), but could also impact current performance levels. There could also be a selection problem, since the outcomes of independence wars determined whether new nations were formed. When independence movements were defeated, conflicts could be counted as civil disputes and potentially excluded from our sample set. If

[25]These were the Austrian Empire, France, Prussia, Russia, and the United Kingdom. France was ranked either first, second, or third among sample countries in the number (16) and years (96) of wars and scaled (1.50) and absolute (792,436) casualties. Russia was ranked in the top deciles for three of these categories and Prussia for two. Austria was ranked in the top one-third for all four categories.

only relatively powerful "states to be" won independence wars, then there would be a positive bias to the impact of war casualties on fiscal capacity. Finally, the cumulative fiscal effects of conflicts on colonizers like Spain, who lost their American possessions in rapid succession over the nineteenth century, could have been stronger than other conflict types with similar numbers of total casualties.

As a proxy for the impact of independence wars, we computed their share in total wars from 1816 to 1913. Table 4 indicates that independence wars comprised just 5 percent of all sample conflicts. This statistic suggests that concerns about independence wars, although valid, should not significantly alter the results of our IV analysis.

A related issue is nineteenth-century European colonization in Africa, Asia, and the Middle East, which could have had long-run fiscal and economic implications.[26] Following Clodfelter (2002), we use different geographical categories to distinguish between wars fought between European states on the European continent itself and wars fought between Europeans or with native states on other continents (see Table 3). For instance, the Crimean War (1853-6) in which France, the United Kingdom, and others fought Russia was classified under Western Europe, while the Arrow War (1856-60) in which France and the UK fought China was classified under East Asia. We counted casualty figures for native soldiers in the colonial armed forces for the European state for which they served according to Clodfelter's summary descriptions. For instance, since sepoys were Indian soldiers that fought in the British armed forces, any sepoy casualties were included in the totals for the United Kingdom. Casualties for armed forces like the native Maratha Empire, by contrast, were included in the totals for India.

To control for the impact of colonization, we computed the share of colonial wars in total wars from 1816 to 1913. Table 4 indicates that colonial wars comprised 21 percent of all sample conflicts. Since this share is notable, our 2SLS analysis also explicitly accounts for colonial origins.

[26] According to O'Brien (2011a, pp. 415-16), the role of colonial revenues in the development of European fiscal systems was negligible. He argues that, after accounting for conquest costs and annual outlays for defense and governance, net flows of colonial tributes into state coffers were typically small or negative.

5 Capacity and Performance: IV Results

Table 5 shows the results of the two-stage least-squares (2SLS) estimates of equation 1. We treat the fiscal capacity variable, F_i, as endogenous, and model the equation

$$F_i = \lambda + \zeta W_i + \boldsymbol{\delta}' \mathbf{X_i} + \nu_i, \tag{2}$$

where W_i is casualties sustained in pre-modern wars per square kilometer of territory. The exclusion restriction is that W_i does not appear in equation 1. Recall from Section 4 that, since we scale our instrument by area, all 2SLS specifications include this variable as a control.[27] We again include continental dummies in all specifications as part of the controls $\mathbf{X_i}$.

Panel A presents the 2SLS estimates for β, our coefficient of interest from equation 1, Panel B the corresponding first stages, and Panel C the corresponding OLS estimates for β.[28] Column 1 shows the strong first-stage relationship between pre-modern war casualties and current fiscal institutions.[29] The corresponding 2SLS estimate of the effect of fiscal capacity on GDP per worker is 4.98. This impact is significant at the 1 percent level. It is also larger than the OLS estimates, which suggests that negative attenuation bias may be more relevant than positive biases from reverse casuality and omitted variables.[30] It is difficult to disentangle the cluster of economic and political institutions that influence actual productivity levels, and any one measure will only account for part of the total effect of the clustering of relevant institutions. It thus appears that the noisiness of our fiscal capacity variable generates a standard problem of measurement error.

To see whether the magnitude of our 2SLS estimate is sensible, we revisit our comparison of two countries with low and medium fiscal capacities, Chad and South Korea. The 2SLS estimate, 4.98, indicates that raising Chad's fiscal capacity to the level of South Korea would increase Chad's worker productivity by 123 percent. Overall,

[27] This variable is typically not significant.

[28] We also re-ran the 2SLS regressions with standard errors clustered in several ways. To account for the possibility that countries that were located near each other were more likely to fight, we clustered by world regions. As an alternative scheme, we clustered by the frequency of war partners according to Table 3. As a third alternative, we clustered by colonial relationships. None of these clustering schemes altered the key results.

[29] We report the results of Angrist-Pischke multivariate F-tests at the bottom of Panel B. This diagnostic, which tests for weak instruments, indicates that our instrument is generally strong across specifications.

[30] For consistency with the 2SLS regressions, the OLS regressions include area as a control here. The coefficient values thus differ slightly from those shown in Table 2.

the Table 5 estimates suggest a large, but not improbable, impact of fiscal capacity on productivity.

Column 2 shows that adding latitude in the baseline regression does not alter the positive and significant relationship between fiscal capacity and productivity. As for Table 2, the coefficient on fiscal capacity falls, but only slightly. Latitude is also significant. Including a squared latitude term does not significantly alter these results. Column 3 includes the political inclusiveness variable, column 4 government size, and column 5 trade openness.[31] Column 6 adds the variables for latitude, political inclusiveness, government size, and trade openness simultaneously. The findings for fiscal capacity are unaltered. Column 7 repeats our baseline specification for our alternative measure of fiscal capacity, the ratio of total taxes to GDP, and column 8 for our alternative measure of performance, TFP. The magnitudes and significance of the results for each of these specifications resemble our baseline case.

Table 6 employs our alternative instruments and related controls. Column 1 adds the variables for the total number of wars and the total years at war to our baseline specification. The effect of fiscal capacity remains similar as before. Column 2 includes the shares of independence wars and colonial wars, respectively. The results for fiscal capacity are again unchanged. Column 3 adds the variables for total wars, war years, and independence and colonial war shares simultaneously. The findings for fiscal capacity are unaltered. Column 4 uses the Clodfelter casualty data from 1700 to 1788. The coefficient values for fiscal capacity are larger than our baseline case. Column 5 uses the battle-related death figures for 1816 to 1913 from the COW database. Here the β coefficient rises even further.[32]

In total, the 2SLS results indicate a substantial impact of fiscal institutions on income per worker. The next section examines the robustness of these findings.

[31] We were also able to treat government size and trade openness as endogenous and instrument for them here. Our key estimates were unaffected. See Section 3 for further details.

[32] However, the first-stage relationship between pre-modern wars and current fiscal institutions is only significant at the 10 percent level, which we attribute to the less comprehensive nature of the COW data (see Section 4).

6 Robustness

6.1 Additional Controls

Whether the 2SLS findings in Tables 4 and 5 are valid depends on the assumption that casualties sustained in pre-modern wars have no direct impact on current worker productivity. Although we argue that this assumption is plausible for the reasons described in Section 4, we now test it further by controlling for other possible variables that may be correlated with both past wars and current economic outcomes, and checking whether the inclusion of these variables affects our estimates. While this exercise cannot totally rule out endogeneity concerns, we find that the key results are robust to the new controls.

Mokyr (1998, 1999) argues that the Industrial Revolution took place in two phases, first in Britain from 1760 to 1830 and second on the European continent and North America from 1870 to 1913. It may be that technological improvements and greater wages during industrialization gave rise to larger militaries (and thus bigger past wars and casualties) and higher current income alike. Column 1 of Table 7 excludes the five historical Great Powers. The key finding for fiscal capacity remains robust.[33]

To further account for past technology and wealth, we use four alternative controls. Comin et al. (2010) emphasize technology adoption levels in 1500, prior to European contact and colonization. Column 2 includes the 1500 technology adoption measure in the baseline specification. The impact of fiscal capacity is unchanged. Similarly, Bockstette et al. (2002), Chanda and Putterman (2007), and Putterman and Weil (2010) argue that a long history of statehood and an early transition to agriculture have a significant influence on income today. Column 3 controls for state antiquity, and column 4 for agricultural transitions. The findings for fiscal capacity are again similar.

As a fourth alternative, we use past population density from the HYDE database of Klein Goldewijk et al. (2010). Given the dearth of country-level income data prior to World War II, we prefer this measure to historical GDP levels. Past population density also enables us to account for the Malthusian phenomenon that, in densely populated places, technologies were more advanced or land was more productive (Galor and

[33]When excluding all 19 OECD countries, the relationship between pre-modern wars and current fiscal institutions is positive, but not significant (the p-value is 0.13). However, re-running this specification without continental dummies, or replacing these dummies with controls for colonial origins, makes this relationship highly significant.

Weil, 1999, 2000, Ashraf and Galor, 2011), which may have affected the likelihood of warfare. Our variable for early population density is for 1820, just after the start of the sample period for our war casualty instrument. To measure density, we computed the number of inhabitants per square kilometer across eight world regions. Column 5 adds this variable. The finding for fiscal capacity remains unchanged. These results also hold if we use population density measures for eras farther back in time (i.e., 1500, 1600, and 1700). Overall, the findings in columns 1 to 5 indicate that past wealth and technology levels do not drive the main results.

La Porta et al. (1998) emphasize the importance of legal origins as a determinant of current institutional environments. Column 6 controls for English, German, Scandinavian, and Socialist legal origins, where the default group consists of countries with French legal origins. Once more, there is little impact on our key estimate.

Colonial history is another potential determinant of current institutions (Acemoglu et al., 2001). Column 7 controls for British, Spanish or Portuguese, and other colonial origins, where the default group consists of countries that were never colonies. The main result for fiscal capacity is unaltered.[34]

Many theories including Max Weber's "Protestant Ethic" claim that religion is an important economic determinant. Column 8 includes the population shares of Catholics and Protestants, also from La Porta et al. (1998). In column 9, we control for ethnic and linguistic fractionalization according to Alesina et al. (2002). Our key estimate remains highly significant in both cases.

Guiso et al. (2009) argue that countries with a long history of wars between them trust each other less, which in turn has negative effects on bilateral trade and investment. Many of the controls that we already use (political inclusiveness, trade openness, early technology adoption, state antiquity, agricultural transitions, past population density, legal and colonial origins, religion, fractionalization) capture trust as well as broader cultural effects. However, as an explicit control we construct a variable from the World Value Survey (2009) which measures the level of trust that individuals have for others. Column 10 adds this variable. Due to data limitations, there are only 44 observations available. The coefficient on fiscal capacity falls, but remains

[34] As an alternative, we used the binary variable for historical colonial status from Comin et al. (2010). The key results did not change. Although it would also be worthwhile to use settler mortality rates from Acemoglu et al. (2001) to instrument for current property rights institutions, severe data limitations prevented this exercise (there are only 36 observations that overlap between Acemoglu et al.'s dataset and ours).

highly significant.[35]

Although the addition of new controls cannot completely exclude the possibility of endogeneity, the key results remain robust. This exercise thus reinforces our claim that pre-modern war casualties are plausibly exogenous.

6.2 Sensitivity Analysis

To test the plausibility of our exogeneity assumption even further, we now perform a sensitivity analysis. This analysis evaluates the extent to which our key results regarding the positive performance effect of greater fiscal capacity can withstand violations of the exclusion restriction. We find that these results are indeed robust to moderate violations.

Recall from Section 5 that our exclusion restriction is that W_i in equation 2 does not appear in equation 1. Following Conley et al. (2012), the sensitivity analysis instead assumes that W_i does in fact appear in equation 1:

$$\log(Y_i/L_i) = \alpha + \beta F_i + \boldsymbol{\gamma}'\mathbf{X_i} + \eta W_i + \epsilon_i. \tag{3}$$

To test how much of a violation of the exclusion restriction could exist before the positive effect of greater fiscal capacity on performance is no longer significant, we consider the following equation

$$\log(Y_i/L_i) - \eta W_i = \alpha + \beta F_i + \boldsymbol{\gamma}'\mathbf{X_i} + \epsilon_i, \tag{4}$$

where we allow η to take values other than zero.

Our inference strategy, which we base on Beber (2009) and Conley et al. (2012), makes the a priori assumption that η is normally distributed with mean zero and variance σ_η^2. We test many values of the standard deviation σ_η, which we vary systematically from 0 to 1 at 0.1 intervals. For each σ_η, we draw 10,000 η values from $\mathcal{N}(0, \sigma_\eta^2)$. The final output generates the percentage of 95-percent confidence intervals for our coefficient of interest β which are always positive.

Table 8 shows the results of the sensitivity analysis. Panel A reproduces the key findings from the eight 2SLS specifications in Table 5. The first row displays the coefficients for the second-stage relationships of fiscal capacity on economic performance,

[35]We re-ran our benchmark IV specification using the same 44 observations as for the trust variable. The 2SLS estimate was 3.39 and is significant. As an alternative, we also constructed another control that measured the level of trust that individuals have for people of other nationalities (here were only 41 observations available for this variable). The key results were unchanged.

and the second row the coefficients for the first-stage relationships of past war casualties on fiscal capacity. Panel B shows the percentage of confidence intervals for β which are always positive. The first row of this panel replicates the benchmark 2SLS specification from column 1 of Table 5, where we assume that the exclusion restriction is met exactly and $\eta = 0$. In this case, all confidence intervals for β will always be positive. The second row increases σ_η to 0.1. The percentage of confidence intervals for β which are always positive remains 100 percent of the time for most specifications. Moreover, for the three specifications for which this percentage falls below 100 (i.e., columns, 3, 6, and 8), it is still very high, ranging from 77 to 98 percent of the time. Although the percentage of confidence intervals for β which are always positive gradually falls as we further increase σ_η, it always includes the majority (and sometimes, the vast majority) of specifications. For the case of $\sigma_\eta = 1$, the percentage of confidence intervals for β which are always positive always exceeds 60 percent of the time, excluding the three specifications described above. For these cases, this percentage still occurs the majority of the time.

Summarizing, the sensitivity analysis indicates that our key results are robust to moderate violations of the exclusion restriction. While we still cannot completely exclude endogeneity concerns, this analysis thus provides further support for the plausibility of our IV approach.

7 Conclusion

A recent literature claims that fiscal capacity plays an important role in economic development. Problems of reverse causation and omitted variables, however, make it difficult to isolate exogenous sources of variation in fiscal institutions in order to estimate their impact on worker productivity. In this paper, we claimed that differences in pre-modern wars could be used as a possible source of exogenous variation in fiscal capacities.

We base our argument on three premises. First, states fought different amounts of external wars, of various lengths and magnitudes. Second, to raise the revenues to wage pre-modern wars, states made fiscal innovations. Economic historians claim that greater fiscal capacity was the key long-run institutional change brought about by historical wars. Third, the impact of past innovations on fiscal systems persisted to the present. Since past wars impact current fiscal institutions, we exploit these

differences as a plausible source of exogenous variation to isolate the impact of fiscal capacity on worker productivity.

Our empirical analysis indicates that there is a strong positive correlation between pre-modern war casualties and current fiscal institutions. Using this source of variation, we estimate substantial effects of fiscal capacity on GDP per worker. We show that our findings are robust to a broad range of specifications, controls, and subsamples.

Since casualties sustained in pre-modern wars are arguably exogenous, they make for plausible instruments to estimate the impact of fiscal capacity on worker productivity. However, the results do not suggest that current fiscal institutions are predestined by pre-modern conflicts and cannot be changed. Our interpretation of the findings is that improvements in fiscal capacity may lead to large economic returns, such as the experiences of the Asian Tiger nations from the 1960s onwards.

Our results indicate that strengthening fiscal institutions would lead to substantial gains in worker productivity, but they do not reveal the precise mechanisms by which such improvements would occur. Some economic historians argue that the state was an active participant in the development of modern capitalist systems (e.g., Gerschenkron, 1966, Magnusson, 2009, Cardoso and Lains, 2010a). For instance, Magnusson (2009) highlights the role of state-funded systems of higher education in science (e.g., institutes of technology) in the industrialization process. A systematic investigation of the specific channels through which greater fiscal capacity impacts long-run economic performance is a key area for future research.

Data Appendix

The database and do-file will be available for future download from the corresponding author's website.

A War Casualties

Casualties Sustained in Pre-Modern Wars: Our main variable for pre-modern conflicts is the number of total casualties sustained by state armed forces in major external conflicts listed as wars, wars of independence, conquests, and campaigns from 1816 to 1913. The term "casualty" refers to all persons lost to active military service, in-

cluding those killed in action or by disease, disabled by physical or mental injuries, captured, deserted, or missing. In rare cases, data limitations imply that our figures refer to soldiers killed or wounded in battle as well as deaths by disease rather than to casualties per se. Likewise, in rare cases casualty figures were not available for all war participants.

We accounted for some modern states by way of external conflicts fought by historical predecessors based on individual war summary descriptions. For Europe, pre-unitary German (e.g., the Kingdom of Prussia) and Italian (e.g., the Kingdom of Sardinia-Piedmont) states were counted for Germany and Italy, respectively. Casualty totals for the Austrian (and later, the Austro-Hungarian) Empire, which we label "Austria" in Table 3, were split equally between its member states.[36] For Africa, we counted the Arab Empire of the Eastern Congo for the Democratic Republic of the Congo, the Mandingo Empire (including casualty totals for tribesman that Clodfelter labels Papel, Fulani, and Beafadi) for Guinea, the Merina Kingdom (whose tribesman Clodfelter labels as Hova) for Madagascar, the Zulu Kingdom (including casualty totals for soldiers that Clodfelter labels Bantu or Xhosa) and, later, the Boer colony for South Africa, and the Ndebele Kingdom for Zimbabwe. For the Middle East and Central Asia, we counted Persia for Iran. For the British Indian Empire, we counted the Maratha Empire for India, the Gurkha Kingdom for Nepal, the Sindhi and Pathan tribes for Pakistan, and the Kandy Kingdom of Ceylon for Sri Lanka. Casualty totals for the Sikh Empire of the Punjab region were split equally between India and Pakistan. For East and Southeast Asia and Oceania, we counted the Aceh Kingdom of Sumatra, Bali, Java, and Lombok for Indonesia and Burma for Myanmar. Casualty totals for the Kashgarian tribes were split equally between Kazahkistan, Tajikistan, Kyrgyzstan, Turkmenistan, and Uzbekistan (due to a lack of fiscal data, the last three entities were excluded as sample countries). For North America, we counted Texas and any other territories that later became U.S. states for the United States. Casualty figures for native soldiers in the colonial armed forces were counted for the European state for which they served according to the summary descriptions. Section 4 provides an example. To account for country size, we scaled this variable by area in square kilometers. Source: Clodfelter (2002).

[36]These were Austria, Belarus, Croatia, the Czech Republic, Hungary, Italy, Poland, Romania, the Slovak Republic, Slovenia, Ukraine, Bosnia and Herzegovina, and Serbia (due to a lack of fiscal data, the last two entities were excluded as sample countries). Counting the casualty totals exclusively for Austria, or splitting them evenly with Hungary, the other modern state most closely associated with the Empire, did not alter the main results of the 2SLS regressions in any significant way.

The first alternative variable resembles the main variable for pre-modern conflicts, except that it covers the period from 1700 to 1788. Based on the summary description from Clodfelter (2002), we counted the Jesuit Reductions for Paraguay. To account for country size, we scaled this variable by area in square kilometers. Source: Clodfelter (2002).

The second alternative for pre-modern conflicts is the number of total battle-related deaths sustained by state armed forces in inter-state or extra-state wars from 1816 to 1913. Once more, pre-unitary German and Italian states were counted for Germany and Italy, and the Austrian Empire was counted for its member states. To account for country size, we scaled this variable by area in square kilometers. Source: Correlates of War Database of Sarkees (2000), Version 3.0.

Total Number of Wars: Total number of wars fought from 1816 to 1913. Source: Clodfelter (2002).

Total Years at War: Total years at war fought from 1816 to 1913. Source: Clodfelter (2002).

Share of Independence Wars: Share of independence wars in total external conflicts from 1816 to 1913, where independence wars were labeled as such. Source: Clodfelter (2002).

Share of Colonial Wars: Share of colonial wars in total external conflicts from 1816 to 1913, where colonial wars were fought by Western and Central European countries in Africa, Asia, and the Middle East. Source: Clodfelter (2002).

B Regression Variables

Log GDP per Worker: Natural logarithm of real gross domestic product per worker in constant dollars (chain index) expressed in international prices, base year 2000. We average this variable from 1990 to 2000. We dropped countries with populations of 500,000 or less from our sample. Source: Penn World Tables of Heston et al. (2006), Version 6.2.

TFP: Total factor productivity relative to that of the United States in 1988. Source: Hall and Jones (1999).

Share of Direct Taxes: Share of total tax revenues from direct taxes, where direct taxes are the sum of income taxes, social security taxes, payroll taxes, and property taxes divided by total tax revenues. We average this variable from 1990 to 2000. Source:

Government Financial Statistics database of the IMF.

Total Taxes to GDP: Total tax revenues divided by GDP in current prices. We average this variable from 1990 to 2000. Source: Government Financial Statistics database of the IMF.

Continental Indicators: The dummy for Africa equals one for sample countries located in Africa. The dummy for Asia equals one for sample countries located in East and Southeast Asia (Japan is counted as an OECD country). The dummy for Latin America equals one for sample countries located in Latin America (Central and South America plus Mexico). Sources: Persson and Tabellini (2003), CIA World Factbook (2009).

Latitude: Absolute value of the distance from the equator, ranging from 0 to 90 degrees. We rescaled this variable to take values between 0 and 1. Source: CIA World Factbook (2009).

Democracy: A country is democratic so long as the variable *polity2* has a strictly positive value. We average this variable from 1990 to 2000. Source: Polity IV Database of Jaggers and Marshall (2008).

Government Size: Government share of real gross domestic product in constant dollars (chain index) expressed in international prices, base year 2000. We average this variable from 1990 to 2000. Source: Penn World Tables of Heston et al. (2006), Version 6.2.

Trade Openness: Sum of export and import shares in GDP, averaged from 1990 to 2000. Source: World Development Indicators of the World Bank (2011).

OECD Indicators: The OECD dummy equals one for sample countries that were OECD members prior to 1993 (Turkey is not counted as an OECD country). Source: Persson and Tabellini (2003).

Area: Physical size measured in millions of square kilometers. Source: CIA World Factbook (2009).

Great Powers Indicators: The Great Powers dummy equals one for sample countries that were historical Great Powers: the Austrian Empire (counted as Austria and Hungary), France, Prussia (counted as Germany), Russia, and the United Kingdom. Source: Ferguson (2006).

Technological Adoption in 1500: Average of sectoral technology adoption indexes in 1500 and adjusted for post-1500 migration. Source: Comin et al. (2010).

State Antiquity: Index that measures the presence of a supra-tribal polity within present-

day country boundaries from 1 to 1950 at 50-year intervals, using a five percent discount rate and scaled between 0 to 50. Source: Putterman (2007).

Agricultural Transitions: Index that measures the number of years since 2000 that the first major region within a given present-day country made the transition from a foraging to an agricultural society, scaled by millenia. Source: Putterman (2006).

Population Density in 1820: Populations of Africa, Asia, the former Soviet Union, Middle East, Europe, Latin America, North America, and Oceania in 1820 (1500, 1600, 1700) divided by area in square kilometers. Source: HYDE Database of Klein Goldewijk et al. (2010).

Legal Origins Indicators: The dummy for English legal origins equals one for sample countries with English legal origins. Similar classifications are used for countries with German, Scandinavian, or Socialist origins. Countries with French legal origins comprise the default group. Source: La Porta et al. (1998).

Colonial Origins Indicators: The dummy for British colonial origins equals one for sample countries that are former colonies of the United Kingdom. The dummy for Spanish or Portuguese colonial origins equals one for countries that are former colonies of Spain or Portugal. The dummy for other colonial origins equals one for countries that are former colonies of countries other than the UK, Spain, or Portugal. Countries that were never colonies comprise the default group. Source: Persson and Tabellini (2003).

Religion: Percentage of the population professing the Catholic or Protestant religion in 1980. Source: La Porta et al. (1998).

Ethnic Fractionalization: One minus the Herfindahl index of ethnolinguistic group shares in 2001. This variable takes higher values for more fractionalized countries. Source: Alesina et al. (2002).

Trust in Others: Country-level average of individual answers to the question, "Would you say that most people can be trusted or that you need to be very careful in dealing with people?" Respondents chose from three options, "don't know" (equal to -1), "most people can be trusted" (equal to 1), or "need to be very careful" (equal to 2). Source: World Values Survey (2009), Wave 2005-7.

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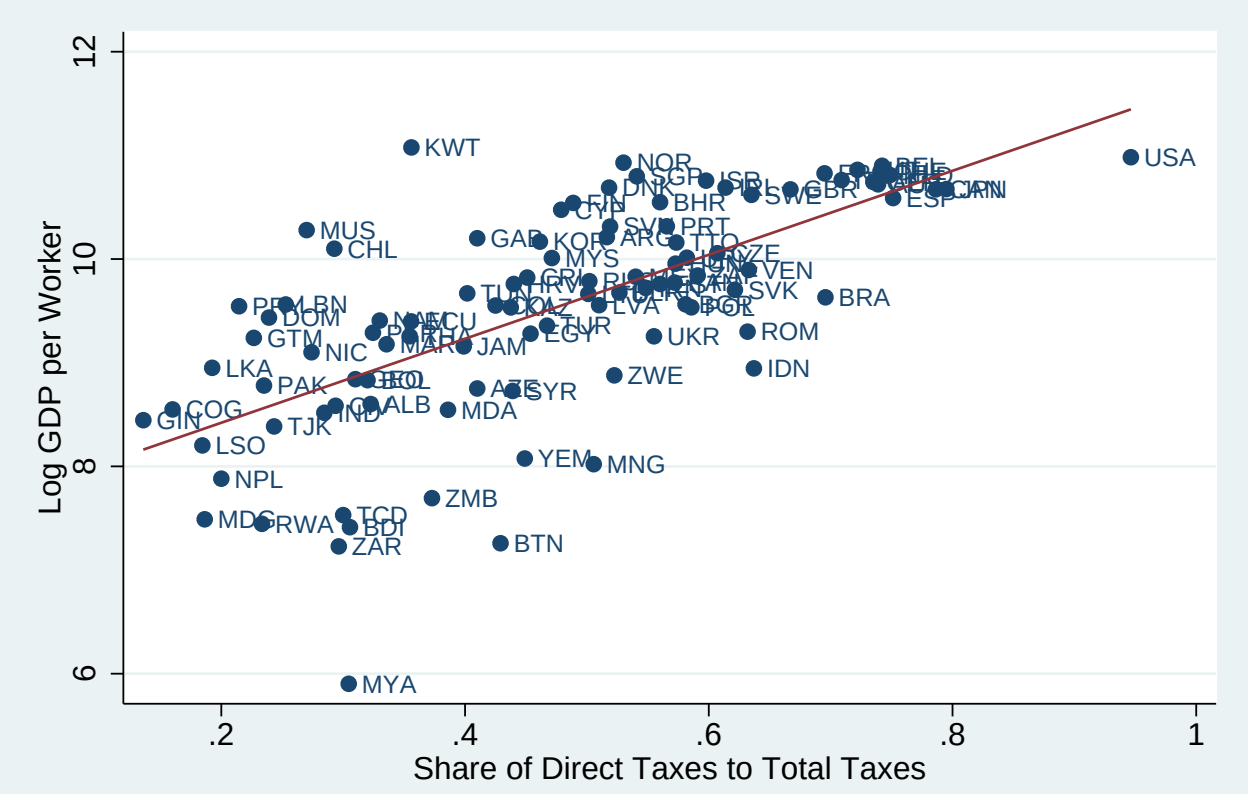
Figure 1: OLS Relationship between Fiscal Capacity and Performance



Sources: IMF Government Financial Statistics (tax data), Penn World Tables (GDP data).

Table 1: Descriptive Statistics

	Obs	Mean	Std. Dev.	Min	Max
GDP per Worker	96	20,667	16,733	366	64,619
Total Factor Productivity	72	0.59	0.30	0.08	1.21
Direct Tax Share	96	0.47	0.17	0.14	0.95
Total Taxes to GDP	87	0.21	0.10	0.01	0.42
Africa	96	0.18	0.38	0	1
Asia	96	0.05	0.22	0	1
Latin America	96	0.19	0.39	0	1
Latitude	96	0.35	0.20	0.00	0.71
OECD	96	0.20	0.40	0	1
Democracy	95	0.72	0.41	0	1
Government Size	96	0.22	0.09	0.04	0.58
Trade Openness	96	0.77	0.44	0.03	3.33
Area (Millions)	96	1.00	2.47	0.0007	17.1
Great Powers	96	0.06	0.24	0	1
Technological Adoption in 1500	75	0.68	0.24	0.17	1.00
State Antiquity	91	433	210	48.8	818
Agricultural Transitions	96	5,044	2,414	362	10,500
Population Density in 1820	96	12.7	12.3	0.10	33.1
English Legal Origins	96	0.24	0.43	0	1
French Legal Origins	96	0.44	0.50	0	1
German Legal Origins	96	0.05	0.22	0	1
Scandinavian Legal Origins	96	0.04	0.20	0	1
Socialist Legal Origins	96	0.23	0.42	0	1
British Colonial Origins	96	0.22	0.42	0	1
Spanish or Portuguese Colonial Origins	96	0.16	0.36	0	1
Other Colonial Origins	96	0.34	0.48	0	1
Catholic Share	96	0.35	0.38	0	0.97
Protestant Share	96	0.13	0.23	0	0.98
Fractionalization	86	0.28	0.26	0	0.87
Trust in People	44	0.26	0.17	0.04	0.74

Sources: See Data Appendix.

Table 2: OLS Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	log Y/L	log Y/L	log Y/L	log Y/L	log Y/L	log Y/L	log Y/L	log Y/L	TFP
Direct Tax Share	3.83***	3.35***	3.61***	3.56***	3.88***	3.01***	3.02***		0.81***
	(0.49)	(0.45)	(0.45)	(0.65)	(0.46)	(0.47)	(0.61)		(0.15)
Total Taxes to GDP								5.49***	
								(1.50)	
Latitude		1.79***				1.28**			
		(0.67)				(0.51)			
Democracy			0.56*			0.41			
			(0.31)			(0.27)			
Government Size				−1.50		−2.15**			
				(1.26)		(0.88)			
Trade Openness					0.59***	0.68***			
					(0.20)	(0.17)			
Other Controls							No OECD		
Continents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.46	0.50	0.50	0.47	0.51	0.59	0.29	0.33	0.38
Number of Observations	96	96	95	96	96	95	77	87	72

***Significant at 1%; **Significant at 5%; *Significant at 10%

Notes: Robust standard errors in parentheses.

Table 3: External Conflicts, 1816-1913

	Conflict	Years	Participants and Coalitions
		Western Europe	
1	Belgian War of Independence	1830-3	Belgium vs. Netherlands
2	First Schleswig-Holstein War	1848-9	Denmark vs. Germany
3	Austro-Sardinian War	1848-9	Austria vs. Italy
4	Crimean War	1853-6	France, Italy, Turkey, UK vs. Russia
5	Franco-Austrian War	1859	Austria vs. France, Italy
6	Second Schleswig-Holstein War	1864	Austria, Germany vs. Denmark
7	Austro-Prussian War	1866	Austria vs. Germany, Italy
		Eastern Europe	
8	Greek War of Independence	1821-9	Algeria, Egypt, Turkey vs. France, Greece, Russia, UK
9	First Russo-Turkish War	1828-9	Russia vs. Turkey
10	Turkish-Montenegran Wars	1852-3	Montenegro vs. Turkey
11	–	1858-9	–
12	–	1861	–
13	–	1876	–
14	–	1877	–
15	Second Russo-Turkish War	1877-8	Bulgaria, Romania, Turkey vs. Russia
16	Austrian Conquest of Bosnia	1878	Austria vs. Bosnia
17	Serbo-Bulgarian War	1885	Bulgaria vs. Serbia
18	Greek-Turkish War	1897	Greece vs. Turkey
19	First Balkan War	1912-13	Bulgaria, Greece, Montenegro, Serbia vs. Turkey
20	Second Balkan War	1913	Bulgaria vs. Greece, Montenegro, Serbia, Romania, Turkey
		North Africa	
21	French Conquest of Algeria	1830-47	Algeria vs. France
22	Spanish-Moroccan War	1859-60	Spain vs. Morocco
23	British-Abyssinian War	1867-8	Ethiopia vs. UK
24	Slave Trade Wars in Sudan	1878-9	Egypt vs. Sudan
25	French Conquest of Tunisia	1881	France vs. Tunisia
26	First Mahdist War	1881-5	Egypt, UK vs. Sudan
27	French Conquest of Western Sudan	1881-98	France, Senegal vs. Sudan
28	First Italian-Abyssinian War	1887	Ethiopia vs. Italy
29	Mahdist-Italian War	1893-4	Italy vs. Sudan
30	Second Italian-Abyssinian War	1895-6	Ethiopia vs. Italy
31	Second Mahdist War	1896-9	Egypt, UK vs. Sudan
32	French Conquest of Chad	1897-1901	Chad vs. France, Senegal
33	French Conquest of Morocco	1903-14	Algeria, France vs. Morocco
34	Spanish-Moroccan War	1909-10	Morocco vs. Spain
35	Italian-Turkish War	1911-12	Italy vs. Turkey
		Sub-Saharan Africa	
36	Portugal's Colonial Wars in Africa	1824	Angola, Mozambique, Guinea vs. Portugal
37	–	1842	–
38	–	1844	–
39	–	1846	–
40	–	1858-1915	–

Source: Clodfelter (2002).

Notes: See Data Appendix for construction method.

Table 3, Continued: External Conflicts, 1816-1913

	Conflict	Years	Participants and Coalitions
		Sub-Saharan Africa, Continued	
41	Kaffir Wars	1818-19	South Africa vs. UK
42	–	1834-5	–
43	–	1846-7	–
44	–	1850-3	–
45	–	1877-8	–
46	First Ashanti War	1824-6	Ghana vs. UK
47	Boer-Zulu War	1838	South Africa vs. UK
48	Second Ashanti War	1873-4	Ghana vs. UK
49	Zulu War	1879	South Africa vs. UK
50	First Boer War	1880-1	South Africa vs. UK
51	Franco-Dahomey Wars	1890	Benin vs. France
52	–	1892	–
53	Arab War	1892-4	Democratic Republic of the Congo vs. Belgium
54	Matabele War	1893	UK vs. Zimbabwe
55	Conquest of Madagascar	1894-9	France vs. Madagascar
56	Zanzibar War	1896	Tanzania vs. UK
57	Conquest of Benin	1897	Benin vs. UK
58	Second Boer War	1899-1901	South Africa vs. UK
59	Conquest of Kano and Sokoto	1903	Nigeria vs. UK
		Middle East and Central Asia	
60	Wahhabi War	1811-18	Egypt, Morocco, Turkey vs. Saudi Arabia
61	War Against Pirates of Oman	1819-21	Oman vs. UK
62	Russo-Persian War	1825-8	Iran vs. Russia
63	First Syrian War	1831-3	Egypt vs. Syria, Turkey
64	Persian-Afghan War	1836-8	Afghanistan vs. Iran
65	Second Syrian War	1839-41	Austria, Turkey, UK vs. Egypt, Syria
66	Russian Conquests in Central Asia	1847	Kazahkistan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan vs. Russia
67	–	1864-76	–
68	–	1878	–
69	–	1878-81	–
70	–	1884-5	–
		British Conflicts in and around the Indian Empire	
71	Kandhian War	1815-18	Sri Lanka vs. UK
72	Gurkha War	1814-16	Nepal vs. UK
73	Third Maratha War	1817-18	India vs. UK
74	First Afghan War	1839-42	Afghanistan vs. UK
75	Sind War	1843	Pakistan vs. UK
76	Gwalior War	1843-4	India vs. UK
77	First Sikh War	1845-6	India, Pakistan vs. UK
78	Second Sikh War	1848-9	India, Pakistan vs. UK
79	Anglo-Persian War	1856-7	Iran vs. UK
80	Umbeyla Campaign	1863	Pakistan vs. UK

Source: Clodfelter (2002).

Notes: See Data Appendix for construction method.

Table 3, Continued: External Conflicts, 1816-1913

	Conflict	Years	Participants and Coalitions
	British Conflicts in and around the Indian Empire, Continued		
81	Bhutan War	1864-5	Bhutan vs. UK
82	Second Afghan War	1878-80	Afghanistan vs. UK
83	Chitral Campaign	1895	Pakistan vs. UK
84	Northwest Frontier Campaign	1897-8	Pakistan vs. UK
	East Asia		
85	Campaigns in Kashgaria	1825-31	China vs. Kazahkstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
86	Opium War	1839-42	China vs. UK
87	Arrow War	1856-60	China vs. France, UK
88	Sino-Japanese War	1894-5	China vs. Japan
	Southeast Asia and Oceania		
89	First Burma War	1824-6	Myanmar vs. India, UK
90	Java War	1825-30	Indonesia vs. Netherlands
91	Australian Aboriginal Wars	1840-1901	Native Australians vs. Australia
92	Maori Wars	1843-6	Maoris vs. UK
93	–	1860-72	–
94	Second Burma War	1852-3	Myanmar vs. India, UK
95	Franco-Vietnamese War	1858-62	France vs. Vietnam
96	Aceh War	1873-1914	Indonesia vs. Netherlands
97	Tonkin War	1883-5	China,Vietnam vs. France
98	Third Burma War	1885	Myanmar vs. India, UK
99	Lombok Campaign	1894	Indonesia vs. Netherlands
100	Filipino-Spanish War	1896-8	Phillipines vs. Spain
101	Russo-Chinese War	1900	China vs. Russia
102	Russo-Japanese War	1904-5	Japan vs. Russia
	United States and Canada		
103	Texas War of Independence	1835-6	Mexico vs. USA
104	Mexican War	1846-8	Mexico vs. USA
105	Spanish-American War	1898	Spain vs. USA
106	Indian Wars in USA	1866-90	Native Americans vs. USA
107	Apache-Mexican Wars	1833	Mexico vs. Native Americans
108	–	1837	–
109	–	1838	–
110	–	1844	–
111	–	1846	–
112	–	1850-1	–
	Carribean Region		
113	Mexican War of Independence	1810-21	Mexico vs. Spain
114	Central American Wars	1822-39	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua vs. each other
115	Yaqui-Mayo Wars	1825-7	Mexico vs. Native Americans
116	–	1867-8	–
117	–	1875-87	–
118	–	1899-1900	–
119	Pastry War	1838	France vs. Mexico

Source: Clodfelter (2002).

Notes: See Data Appendix for construction method.

Table 3, Continued: External Conflicts, 1816-1913

	Conflict	Years	Participants and Coalitions
		Carribean Region, Continued	
120	Haitian-Dominican Wars	1844	Dominican Republic vs. Haiti
121	–	1845	–
122	–	1849	–
123	–	1854-6	–
124	Filibuster War	1856-7	Costa Rica, El Salvador, Guatemala, Honduras vs. William Walker
125	War of the French Intervention	1862-7	Austria, Belgium, France vs. Mexico
126	War of the Restoration	1863-5	Dominican Republic vs. Spain
127	Ten Years' War	1868-78	Cuba vs. Spain
128	Central American War of 1876	1876	El Salvador, Honduras vs. Guatemala
129	Cuban War of Independence	1895-8	Cuba vs. Spain
130	Central American War of 1906	1906	El Salvador, Honduras vs. Guatemala
131	Central American War of 1907	1907	El Salvador, Honduras vs. Nicaragua
		South America	
132	South American Wars of Independence	1810-25	Argentina, Chile, Colombia, Ecuador, Peru, Uruguay, Venezuela vs. Portugal, Spain
133	Brazilian War of Independence	1822-3	Brazil vs. Portugal
134	Argentine-Brazilian War	1825-8	Argentina vs. Brazil
135	Peruvian-Colombian War	1827-9	Bolivia, Colombia vs. Peru
136	War of the Confederation	1836-9	Argentina, Chile vs. Bolivia, Peru
137	Bolivian-Peruvian War	1841	Bolivia vs. Peru
138	Ecuadorian-Colombian War	1863	Colombia vs. Ecuador
139	Paraguayan War	1864-70	Argentina, Brazil, Uruguay vs. Paraguay
140	Naval War with Spain	1865-6	Peru vs. Spain
141	War of the Pacific	1879-84	Bolivia, Peru vs. Chile

Source: Clodfelter (2002).

Notes: See Data Appendix for construction method.

Table 4: Descriptive Statistics for Instrumental Variables and Related Controls

	Mean	Std Dev	Min	Max
Pre-Modern War Casualties	0.10	0.26	0	1.51
Total Number of Wars	3.57	5.69	0	43
Total Years at War	15.0	22.2	0	121
Share of Independence Wars	0.05	0.14	0	1
Share of Colonial Wars	0.21	0.38	0	1
Pre-Modern War Casualties, 1700-88	0.20	0.54	0	3.36
Pre-Modern Battle Deaths, COW	0.06	0.18	0	1.06

Sources: See Data Appendix.

Notes: Unless stated otherwise, the instruments were constructed using 1816-1913 data. There are 96 observations for each variable.

Table 5: 2SLS Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Two-Stage Least Squares							
	log Y/L	log Y/L	log Y/L	log Y/L	log Y/L	log Y/L	log Y/L	TFP
Direct Tax Share	4.98***	4.44***	4.24***	4.73***	5.30***	4.12**		1.81***
	(1.16)	(1.19)	(1.36)	(1.31)	(1.32)	(1.70)		(0.62)
Total Taxes to GDP							7.31***	
							(1.85)	
Latitude		1.46**				1.01		
		(0.73)				(0.67)		
Democracy			0.51			0.36		
			(0.33)			(0.27)		
Government Size				−1.01		−1.59		
				(1.37)		(1.25)		
Trade Openness					0.55***	0.64***		
					(0.20)	(0.19)		
Area	−0.05	−0.05*	−0.04	−0.05	−0.03	−0.02	0.07*	−0.02*
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.01)
Continents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Panel B: First Stage							
	Direct Share	Direct Share	Direct Share	Direct Share	Direct Share	Direct Share	Taxes to GDP	Direct Share
Pre-Modern War Casualties	0.16***	0.15***	0.14***	0.15***	0.17***	0.12***	0.11***	0.16***
	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.03)	(0.05)
Latitude		0.31***				0.24*		
		(0.10)				(0.12)		
Democracy			0.08**			0.03		
			(0.03)			(0.04)		
Government Size				−0.46***		−0.48***		
				(0.16)		(0.17)		
Trade Openness					0.02**	0.04		
					(0.03)	(0.03)		
Area	0.02*	0.02	0.02*	0.02*	0.02*	0.02	−0.004**	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.002)	(0.01)
Continents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Angrist-Pischke F-Test	11.49***	11.67***	8.27***	13.20***	11.14***	11.12***	10.32***	9.54***
Adjusted R^2	0.31	0.35	0.33	0.35	0.30	0.41	0.18	0.34
No of Observations	96	96	95	96	96	95	87	72
	Panel C: Ordinary Least Squares							
Direct Tax Share	3.99***	3.51***	3.76***	3.72***	3.93***	3.04***		0.83***
	(0.50)	(0.45)	(0.45)	(0.65)	(0.46)	(0.47)		(0.16)
Total Taxes to GDP							5.79***	
							(1.58)	

***Significant at 1%; **Significant at 5%; *Significant at 10%

Notes: Robust standard errors in parentheses.

Table 6: 2SLS Regressions with Alternative IVs

	(1)	(2)	(3)	(4)	(5)
Panel A: Two-Stage Least Squares (Dependent Variable is log Y/L)					
Direct Tax Share	4.54***	5.82***	4.29***	6.22***	7.90***
	(1.27)	(1.48)	(1.44)	(1.30)	(2.81)
Total Number of Wars	−0.09		−0.01		
	(0.01)		(0.01)		
Total Years at War	0.004		0.010**		
	(0.004)		(0.004)		
Share of Independence Wars		−0.46	−0.31		
		(0.65)	(0.53)		
Share of Colonial Wars		−0.52*	−0.80**		
		(0.29)	(0.34)		
Area	−0.05	−0.07	−0.06*	−0.07	−0.10
	(0.03)	(0.04)	(0.03)	(0.05)	(0.07)
Continents	Yes	Yes	Yes	Yes	Yes
Panel B: First Stage (Dependent Variable is Direct Tax Share)					
Pre-Modern War Casualties	0.14***	0.17***	0.14***		
	(0.06)	(0.05)	(0.05)		
Total Number of Wars	0.001		0.003		
	(0.004)		(0.004)		
Total Years at War	0.000		0.000		
	(0.001)		(0.001)		
Share of Independence Wars		0.29***	0.29***		
		(0.08)	(0.09)		
Share of Colonial Wars		−0.08	−0.09*		
		(0.05)	(0.05)		
Pre-Modern War Casualties, 1700-88				0.09***	
				(0.03)	
Pre-Modern Battle Deaths, COW					0.14*
					(0.08)
Area	0.02	0.02	0.02	0.02*	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Continents	Yes	Yes	Yes	Yes	Yes
Angrist-Pischke F-Test	6.60***	10.52***	6.45***	12.39***	3.21*
Adjusted R^2	0.29	0.36	0.36	0.31	0.27
Number of Observations	96	96	96	96	96
Panel C: Ordinary Least Squares					
Direct Tax Share	3.92***	3.77***	3.53***	3.99***	3.99***
	(0.49)	(0.49)	(0.48)	(0.50)	(0.50)

***Significant at 1%; **Significant at 5%; *Significant at 10%

Notes: Robust standard errors in parentheses.

Table 7: Robustness Checks for 2SLS Regressions

	(1)	(2)	(3)	(4)	(5)
Panel A: Two-Stage Least Squares (Dependent Variable is log Y/L)					
Direct Tax Share	4.14***	5.40***	5.23***	4.86***	5.52***
	(1.35)	(1.43)	(1.13)	(1.10)	(1.27)
Technological Adoption in 1500		0.86			
		(0.87)			
State Antiquity			0.12		
			(0.39)		
Agricultural Transitions				0.000	
				(0.000)	
Population Density in 1820					−0.02
					(0.01)
Fractionalization					
Trust in People					
Other Controls	No Great Powers				
Area	−0.08	−0.05	−0.05	−0.04	−0.08*
	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Continents	Yes	Yes	Yes	Yes	Yes
Panel B: First Stage (Dependent Variable is Direct Tax Share)					
Pre-Modern War Casualties	0.17**	0.13***	0.18***	0.18***	0.16***
	(0.07)	(0.05)	(0.06)	(0.05)	(0.05)
Technological Adoption in 1500		0.40***			
		(0.10)			
State Antiquity			0.14		
			(0.10)		
Agricultural Transitions				0.000***	
				(0.000)	
Population Density in 1820					0.001
					(0.002)
Fractionalization					
Trust in People					
Other Controls	No Great Powers				
Area	0.04***	0.01	0.02	0.01	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Continents	Yes	Yes	Yes	Yes	Yes
Angrist-Pischke F-Test	6.13**	7.34***	9.51***	14.53***	9.97***
Adjusted R^2	0.35	0.46	0.32	0.34	0.30
No of Observations	90	75	91	96	96
Panel C: Ordinary Least Squares					
Direct Tax Share	4.08***	3.53***	4.16***	4.05***	4.06***
	(0.53)	(0.73)	(0.48)	(0.55)	(0.51)

***Significant at 1%; **Significant at 5%; *Significant at 10%

Notes: Robust standard errors in parentheses.

Table 7, Continued: Robustness Checks for 2SLS Regressions

	(6)	(7)	(8)	(9)	(10)
Panel A: Two-Stage Least Squares (Dependent Variable is log Y/L)					
Direct Tax Share	4.92***	5.49***	4.76***	5.53***	3.92***
	(1.10)	(1.08)	(1.16)	(1.40)	(1.41)
Technological Adoption in 1500					
State Antiquity					
Agricultural Transitions					
Population Density in 1820					
Fractionalization				0.11	
				(0.43)	
Trust in People					1.08*
					(0.60)
Other Controls	Legal Origins	Colonial Origins	Religion		
Area	−0.05	−0.07	−0.05	−0.06	−0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Continents	Yes	Yes	Yes	Yes	Yes
Panel B: First Stage (Dependent Variable is Direct Tax Share)					
Pre-Modern War Casualties	0.16***	0.17***	0.14***	0.14***	0.14***
	(0.04)	(0.05)	(0.03)	(0.05)	(0.05)
Technological Adoption in 1500					
State Antiquity					
Agricultural Transitions					
Population Density in 1820					
Fractionalization				−0.11	
				(0.07)	
Trust in People					0.34**
					(0.13)
Other Controls	Legal Origins	Colonial Origins	Religion		
Area	0.02*	0.02*	0.02**	0.02*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Continents	Yes	Yes	Yes	Yes	Yes
Angrist-Pischke *F*-Test	15.13***	9.33***	15.73***	8.55***	8.50***
Adjusted R^2	0.35	0.28	0.41	0.34	0.32
No of Observations	96	96	96	86	44
Panel C: Ordinary Least Squares					
Direct Tax Share	3.63***	4.03***	3.39***	4.09***	2.96***
	(0.50)	(0.50)	(0.49)	(0.56)	(0.53)

***Significant at 1%; **Significant at 5%; *Significant at 10%

Notes: Robust standard errors in parentheses.

Table 8: Sensitivity Analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: 2SLS Regressions from Table 5							
Fiscal Capacity on	4.98***	4.44***	4.24***	4.73***	5.30***	4.12**	7.31***	1.81***
Performance	(1.16)	(1.19)	(1.36)	(1.31)	(1.32)	(1.70)	(1.85)	(0.62)
War Casualties on	0.16***	0.15***	0.14***	0.15***	0.17***	0.12***	0.11***	0.16***
Fiscal Capacity	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.03)	(0.05)
Latitude		Yes				Yes		
Democracy			Yes			Yes		
Government Size				Yes		Yes		
Trade Openness					Yes	Yes		
Area	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
σ_η	Panel B: Percentage of Confidence Intervals over which β Is Always Positive							
0.0	100	100	100	100	100	100	100	100
0.1	100	100	98	100	100	77	100	81
0.2	99	93	84	93	99	64	97	68
0.3	93	84	74	84	93	61	90	62
0.4	86	78	68	77	86	57	83	59
0.5	81	72	65	72	81	56	78	58
0.6	77	68	63	68	77	54	75	56
0.7	74	67	62	67	73	54	71	56
0.8	70	64	60	64	71	54	69	55
0.9	69	63	58	64	69	53	66	54
1.0	67	62	58	63	67	53	65	53

***Significant at 1%; **Significant at 5%; *Significant at 10%

Notes: See Table 5 for details.