The Great Revenue Divergence

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This article describes and explains a previously overlooked empirical pattern in state revenue collection. As late as 1913, central governments in the West collected similar levels of per-capita revenue as the rest of the world, despite ruling richer societies and experiencing a long history of fiscal innovation. Western revenue levels permanently diverged only in the following half century. We identify the twentieth–century great revenue divergence by constructing a new panel dataset of central government revenue with broad spatial and temporal coverage. To explain the pattern, we argue that sustainably high levels of revenue extraction require societal demand for an activist state and an existing supply of effective bureaucratic institutions. Neither factor in isolation is sufficient. We formalize this insight in a game-theoretic model. The government can choose among low-effort, legibility-intensive, and crony-favoring strategies for raising revenues. Empirically, our theory accounts for low revenue intake in periods of low demand (nineteenth-century West) or low bureaucratic capacity (twentieth–century former colonies), and for eventual revenue spikes in the West.

The gap in the quality of government services in Western and non-Western countries is founded on disparities in taxation. Between 2010–19, central governments in Western European states and offshoots extracted, on average, 43% of their country's annual GDP in government revenues, compared to 27% in non-European countries.[1] Disparities in per–capita revenue intake are even greater, given much higher income levels in the West. When and why did these gaps in revenue collection emerge? Understanding this question is critical because tax collection and fiscal capacity are strongly associated with economic development, political order, and governance quality more broadly.[2]

We demonstrate that major discrepancies in state revenue collection are a recent phenomenon. On the eve of World War I, South American countries and some export-oriented colonies collected similar levels of per-capita revenue as in the West despite lower GDP; and often exceeded Western revenue collection when accounting for income differences. Many Asian and African countries and colonies lagged Europe, but these differences were small by twentieth-century standards. However, over the following half century, per–capita revenue intake skyrocketed in Western countries, compared to more modest increases elsewhere. The newfound revenue gap between Western and non-Western countries persisted, and in fact widened, even after former European colonies gained independence. In sum, the *great revenue divergence* occurred in the twentieth century.

We identify this previously overlooked pattern by constructing a new panel dataset of central government revenue. We combined data on central government revenue from Mitchell with historical exchange rates, gold prices, and population.[3] The main contribution of our dataset is its spatial and temporal breadth: at least one year for 18 Western countries (including 15 with at least one data point in the nineteenth century) and 76 non-Western countries (42 in the nineteenth century). This contrasts with existing government revenue datasets that have coverage before the twentieth cen-

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[1]Calculated by authors using data from the **?**.
[2]**??**Dincecco 2017.
[3]Mitchell 1998.

tury only (or mainly) for European countries,[4] or only the late twentieth century.[5] By combining depth and breadth, our dataset is uniquely suitable for analyzing comparative historical trends in government revenues.[6] We supplement our measure of revenues per capita with data on taxes/GDP from Andersson and Brambor.[7] We demonstrate a qualitatively similar pattern of revenue divergence when accounting for income differentials, albeit on a truncated sample.

Existing theories of revenue extraction, taken in isolation, cannot explain the great revenue divergence. Some scholars analyze *fiscal demand*. These theories emphasize how some states have greater needs than others to extract revenues, often because of participation in external wars. By contrast, *fiscal supply* explanations focus on the bureaucratic institutions used to gather information about the population. Bureaucracies enable states to accurately assess tax burdens and to efficiently extract revenues by making production legible to the state, which is alternatively referred to as high fiscal capacity.

However, existing bellicose and state-legibility explanations cannot answer two key questions about the twentieth–century revenue divergence. First, why did it occur so late? Existing accounts date large and permanent discrepancies in revenue collection to the nineteenth century or earlier. In the late eighteenth century, England and France each collected higher revenue per capita than major non-Western empires.[8] Over the next century, Western states improved their fiscal capacity by collecting voluminous information about their populations,[9] enacting modern fiscal

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[4]Beramendi et al. 2019; **?**; Karaman and Pamuk 2010; Scheve and Stasavage 2016.

[5]**?**Queralt 2019.

[6]Although other scholars have also constructed datasets using Mitchell 1998, later we explain why our approach to making data points comparable across countries yields a much broader sample.

[7]Andersson and Brambor 2019.

[8]Karaman and Pamuk 2010, 623; Rosenthal and Wong 2011, 175; Hoffman 2015, 51; Dincecco 2017, 69.

[9]Brambor et al. 2020.

devices such as income taxes,[10] and undergoing modern industrial development.[11] By contrast, much of the rest of the world was under, or had recently gained independence from, Western colonial rule. Yet in the early twentieth century, the West was not clearly distinguished in its revenue intake. Thus, a permanently large revenue divergence occurred well after these discrepancies in latent fiscal capacity and economic development had emerged.

Second, in the twentieth century, why did non-Western countries continue to fall behind even after gaining independence? Leading existing explanations focus on how non-European countries during this period either fought too few wars, or only limited international wars funded by debt and civil wars.[12] Yet many newly independent states exhibited high demand for public expenditures. Anti-colonial activists believed that jurisdictional sovereignty would engender higher levels of public spending by aligning the government's incentives with its citizens rather than with European bondholders and civil servants.[13] Anti-colonial movements sought to use government to provide greater services for citizens. Furthermore, international competition was high in some parts of the post-colonial world (Middle East, South Asia, and East Asia), and most colonies experienced mass franchise expansion shortly before gaining independence. These pressures created additional demand for public expenditures.

To unravel the puzzle of the great revenue divergence, we develop a formal-theoretic framework to explain why high levels of revenue intake require the conjunction of high demand for an activist government and high supply of bureaucratic, or fiscal, capacity. A state with high fiscal capacity has a *latent advantage* at raising revenues. However, absent demand from politically relevant actors for fiscal expenditures, the governing elite will keep taxes low and underutilize the state's fiscal potential. Conversely, a state with weak bureaucratic capacity cannot immediately remedy this shortcoming because levels of societal legibility are highly persistent, at least in the short term. Faced with a pressing demand for revenues, a low-capacity state turns to *crony-favoring*

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[10] **?**.

[11] **?**.

[12] **?** Centeno 2002; **?**; Queralt 2019.

[13] **?**.

extraction: gaining revenues in return for granting a favorable market position to cronies. Although less lucrative than an effective income tax, low-capacity states lack the bureaucratic infrastructure to efficiently administer a legibility-intensive tax. Only states with high fiscal demand and high fiscal supply can monitor production effectively enough to extract high revenues from *legibility-intensive* revenue sources, and have the political will to tax heavily.

We also explain how political actors can bolster bureaucratic capacity over time. By choosing legibility-intensive extraction in the present, the government can bolster societal legibility in the future via learning-by-doing effects. Although bellicose factors can encourage states to invest in future fiscal capacity, other factors matter as well. Contrary to bellicose theories, anticipation of high demand in the future does not necessarily engender "common value states" (as discussed by Besley and Persson) that refrain from predating their economy.[14] Instead, crony-favoring extraction remains the best strategy for raising revenues if the stock of bureaucratic capacity will remain low regardless of the state's actions. This is true when the initial stock of bureaucratic capacity is sufficiently low or the potential for bureaucratic growth is low. Conversely, states for which either of these conditions are more favorable can gain from establishing legibility-intensive extraction. If fiscal demand is low in the present, the government incurs up-front costs to implementing extractive taxes, and initially underutilizes its fiscal capacity. However, by investing in fiscal capacity, the government positions itself to collect high levels of revenue in the future—if demand increases. Furthermore, the net costs of pivoting to legibility-intensive taxation are lower from the perspective of the governing elite when customs taxes entail high deadweight losses and income taxes create more favorable distributional effects for them.

In sum, our main theoretical implication is that large revenue intake requires the conjunction of high fiscal supply and high fiscal demand. Over time, divergence in revenue intake occurs if demand grows. High-capacity states distinguish themselves in revenue collection only when fiscal demand is high.

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Evidence from the nineteenth and twentieth centuries supports these expectations. By the nineteenth century, Western countries had amassed important advantages in latent fiscal capacity relative to other countries, in part because of prior warfare.[15] Western states expanded their bureaucratic capacity throughout the century because of ongoing industrialization, the spread of national identity and public education,[16] and elite coalitions that wanted to shift the distributional burden of taxes.[17] But the relative lack of intra-European wars between 1816 and 1913—a period that also predated modern welfare states—limited the demand for revenues. Consequently, Western states underutilized their growing fiscal capacity. Primary product exporters in South America as well as some colonial dependencies could generate similar levels of revenue simply by collecting customs taxes. Furthermore, some non-Western empires partially caught up because threats from the West created high fiscal demand. Thus, on the eve of World War I, there was a small or non-existent gap between the West and various groups of non-Western countries.

The two World Wars and Great Depression changed this calculus for Western states, who restructured their economies to fight total war. These stimuli unleashed permanently higher demand for social spending because of ensuing franchise expansion and the creation of welfare states. Prior investments in fiscal capacity enabled Western states to raise historically unprecedented levels of revenues, in particular through legibility-intensive sources such as income and value-added taxes.

By contrast, most European colonies suffered from low fiscal capacity. Colonial governments promoted primary product exports or collected low-yield direct taxes locally.[18] If these revenue sources were insufficient on their own to balance the budget, colonial governments could take advantage of permissive conditions for international borrowing.[19] However, the bureaucratic infrastructure was wholly inadequate for meeting heightened demand after countries gained indepen-

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[16]**?**.

[17]**??**.

[18]**?**.

[19]Queralt 2019.

dence. Many post-colonial states with high fiscal demand turned toward crony-favoring strategies. Prior underinvestment in bureaucratic capacity prevented these states from effectively collecting legibility-intensive taxes.

The main non-Western exceptions were East Asian states, in particular Japan. Intense geopolitical pressure combined with a history of bureaucratic government enabled large increases in legibility-intensive taxation, similar to the West.

1 The Great Revenue Divergence: Trends Over Time

After introducing our new data, this section provides descriptive evidence of a great revenue divergence between Western Europe (and Japan) and the rest of the world starting around 1914. We then contrast the late onset of this revenue divergence with the earlier economic gap that had emerged between the West and the rest of the world.

1.1 Introducing the Revenue Data

Our main measure is central government revenue per capita in gold grams, which we constructed using the following steps.

1. We use data on *central government revenues* from Mitchell.[20] We translated fiscal years into calendar years to measure each country's annual revenues in thousands of local-currency units (although in some cases revenue is listed in U.S. dollars).

2. We use population data from Mitchell to calculate *revenue per capita*.[21] Exact population estimates are typically available only in census years, and we estimated population in non-census years by linearly interpolating between censuses (although we drop observations for

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[20]Mitchell 1998.
[21]Mitchell 1998.

which no census occurred within two decades). For this reason, we cannot estimate revenue per capita before the date of the first census, even when earlier revenue data are available.[22]

3. We converted all currency measures to their equivalents in British pounds to generate a *common scale* for revenue levels. This required constructing a new time series of historical exchange rates into pounds.[23] We were unable to perform this step for country-years with non-convertible currencies, and thus we drop such observations even if revenue and population data are available.[24]

4. Finally, we converted revenue per capita in British pounds into *gold grams*.[25] Although unnecessary for cross-national comparisons, this step reduces problems in data visualization stemming from the volatility of the pound. It also makes our revenue series directly comparable to existing historical datasets that measure revenue in gold grams.

Our revenue variable advances existing quantitative data on state revenue in both geographical and

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[22]An exception is that, for Africa, we incorporated **?** data for 1850–1960; otherwise, almost all these observations would drop from the sample. We also incorporated additional population data for Russia that we discuss in Appendix A.7.

[23]We converted local currency units into British pounds. Correlates of War (COW) trade data (**?**) provide the main source for historical exchange rates. COW does not include data before 1870 or from colonies (although most colonies used the mother country's currency), and we supplement their data using **?** and Officer (2016). Because COW data uses market quotes, it exhibits frequent short gaps for smaller countries. To reduce this problem, we interpolated rates in cases in which the data coverage gap was less than five years and the difference in rates on either side of the gap did not exceed 5%.

[24]Although we included some currencies with fixed exchange rates, we excluded currencies for which published exchange rates bore no relation to market supply and demand, or the exchange rate exhibited sharp year-to-year fluctuations. In many cases, this meant excluding periods of instability when a country's link to either gold or the dollar changed.

[25]Prices for gold ounces from Officer 2016.

chronological coverage. The amount of data available is extensive, extending back to the early nineteenth century in Western Europe and the late nineteenth century in most of the rest of the world. Specifically, the revenue data include at least one year for 18 Western countries and 76 non-Western countries. Fifteen Western countries have at least one data point in the nineteenth century, as do 42 non-Western countries. Relative world currency prices have fluctuated violently since the Bretton Woods system ended. For this reason, we analyze data only through 1969. Appendix Figure A.1 plots revenues over time for each territory in the dataset.

We are not the first to use the Mitchell revenue data for historical analysis.[26] However, our approach to weighting the data points enables us to incorporate more information than in existing studies. For example, Besley and Persson compute an unweighted average over time for eighteen rich countries.[27] Consequently, they do not calculate revenue collection for poorer countries in the nineteenth or early twentieth centuries, nor make time-series cross-section comparisons across a broad country and time sample. Others use Mitchell data from the nineteenth century, but only for European countries.[28] Yet others use Mitchell and other sources to construct a sample that is expansive globally after 1945, but confined to Western Europe, Japan, and the Southern Cone in the nineteenth century.[29]

Despite clear advantages of expansive country and time coverage, our approach to measuring state revenue intake also has drawbacks. Although we follow existing work on historical revenue collection by expressing revenue in gold or silver,[30] research on contemporary fiscal extraction typically examines government revenue as a percentage of GDP. Thus, comparing trends in per–capita revenue extraction does not rule out the possibility that differences in revenues mostly reflect changes in societal income. We address this concern in two ways. First, we analyze patterns for taxes as a

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[26]Mitchell 1998.

[27]**?**.

[28]**?**, 358-401; Karaman and Pamuk 2010; **?**.

[29]**?**; Beramendi et al. 2019.

[30]**?**Dincecco 2017; Karaman and Pamuk 2010; **?**.

fraction of GDP using data from Andersson and Brambor,[31] albeit at the cost of a restricted non-Western sample. Second, we compare the timing of revenue and income divergence to show that large increases in revenue intake among Western countries lagged large income gains by at least a half century.

1.2 Documenting the Great Revenue Divergence

Figure 1 documents the great revenue divergence. Panel A presents our main measure of per-capita revenues. Panel B presents taxes as a fraction of GDP, albeit at the cost of a smaller sample in which non-Western countries are restricted to South America (plus Mexico).

[FIGURE 1 ABOUT HERE]

Before World War I, the West did not dwarf other areas in revenue collection. In 1913, Chile and Uruguay each collected more revenue per capita than any country in Western Europe. Denmark collected less revenue than these two as well as Trinidad and Tobago, South Africa, Malaysia, Cuba, and Panama. The United States collected even less than that, and was slightly behind Brazil and slightly ahead of Jamaica. When compared to *all* non-Western countries, Western countries collected somewhat more revenue (2.5 times). However, this discrepancy is small by contemporary standards, and is mostly driven by meager revenues in many African colonies. Of the 49 non-Western countries in our dataset in 1913, 23 are in Africa, and Western countries collected 5.6 times more revenue than these colonies.

These patterns changed drastically after 1913. Between 1914 and 1969, per–capita revenue intake increased on average by 1,547% in Western countries. Sharp gains were not entirely confined to the West, as Japan experienced a sixteen-fold increase during this period. However, other non-Western countries failed to keep pace, and on average their revenues grew by 446%. Thus, gains outside the West were 71% smaller than those among Western countries. The patterns are largely

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[31]Andersson and Brambor 2019.

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similar among different subsets of non-Western countries: 359% increase in South America and the Caribbean, 428% in Africa, and 564% in Asia (Middle East, South Asia, Southeast Asia, East Asia excluding Japan).[32] By 1969, the ordering of countries in terms of per–capita revenue collection largely mirrors contemporary rankings, with nearly every country outside the West (except Japan) trailing every Western country. Overall, by this time, the average Western state collected 8.5 times more in per-capita revenue than the average non-Western state.

The divergence is also stark when assessing taxes as a fraction of GDP. As Panel B shows, South America outpaced the West on this measure throughout the nineteenth century. In 1913, Britain lagged Brazil, Uruguay, Chile, and Argentina. However, between 1914 and 1969, taxes rose from 6.4% to 19.7% of GDP in Western countries, a three-fold difference. The gains among South American countries were smaller, rising from 7.1% up to 12.7%. Overall, these gains were 41% smaller than those in the West.

The robustness of the main pattern to differences in GDP is unsurprising when we consider historical timing. When economic historians discuss a "great divergence," they mean the divergence in per–capita economic output between Western and non-Western countries.[33] Although scholars debate the timing and causes of this divergence, they agree it occurred no later than the mid-nineteenth century amid the spread of the Industrial Revolution across Europe. Figure 2 compares Western countries to non-Western countries on both revenues per capita and GDP per capita. Until World War I, Western countries typically had a larger advantage in GDP than they did in revenue collection. In the following decades, the revenue ratio increased more sharply than the GDP ratio.

[FIGURE 2 ABOUT HERE]

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[32]The countries in the sample in each region are not identical 1913 and 1969, and we verified that the magnitude of the increases were qualitatively similar when restricting the comparisons to a constant basket of countries.

[33]**?**.

1.3 Robustness Checks

In the appendix, we analyze the robustness of our core pattern. In Figure 1, we use taxes/GDP from Andersson and Brambor.[34] Compared to alternatives, it (a) has lesser missingness relative to our core dataset (52% of country-years are missing) and (b) uses natural units. In Appendix A.1, we demonstrate qualitatively similar trends when using alternative datasets that account for differences in GDP. We analyze taxes/GDP from Beramendi, Dincecco, and Rogers,[35] which is missing 69% of the country-years from our core dataset, and has 47% fewer observations for non-Western countries than Andersson and Brambor.[36] We also constructed a panel of normalized revenue data. Despite relatively better data coverage (missing 42% of country-years compared to our core sample), the units are non-natural because we divide *nominal* revenue intake in the local currency by *constant-U.S. dollar* GDP estimates from Bolt et al.'s update of Angus Maddison.[37]

One concern with our main measure of revenue per capita is that, by using nominal exchange rates, longitudinal changes in revenues may reflect changes in the foreign exchange market rather than changes in actual revenue. Appendix A.2 explains two ways in which our main measure guards against this concern. We also present intra-imperial comparisons, hence comparing territories that used the same currency or a highly stable peg. Nor can we directly account for differences in purchasing power or directly measure tax intake. However, Appendixes A.3 and A.4 explain why these shortcomings are unlikely to influence the findings. We also created a separate series that expresses central government revenue per capita in silver, rather than gold, grams. Ultimately, the choice of precious metal does not qualitatively alter the main pattern. In Appendix A.5, we discuss why we chose gold rather than silver for our primary measure. Finally, in Appendix A.6, we estimate regression coefficients for the interaction of regional location and time period to express the core pattern from Figure 1 in more precise quantitative terms.

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[34] Andersson and Brambor 2019.

[35] Beramendi et al. 2019.

[36] Andersson and Brambor 2019.

[37] Bolt et al. 2018.

2 Existing Theories

Why did a large and permanent revenue divergence occur in the twentieth century, but not earlier? To answer this question, we build upon the rich existing literature on government revenues and state capacity. We categorize existing theories based on whether they focus on the *demand* for greater public spending, or the *supply* of bureaucratic institutions that facilitate revenue collection. Although both perspectives yield important insights, each is incomplete for explaining the twentieth–century great revenue divergence.

2.1 Fiscal Demand

Demand-based theories of taxation focus on factors that create stronger preferences for central government revenues. The most commonly studied demand factor in the literature is international warfare. Scholars broadly accept that external wars played an important role in facilitating modern European states.[38] Other authors make the converse argument that less intense geopolitical competition in many ex-colonies in Sub-Saharan Africa and Latin America has undermined their state-building efforts.[39]

Directly, preparation for and participation in an external war raises the state's need for revenue to pay and deploy soldiers for the conflict. Indirectly, these conditions may persist in a post-war ratchet effect. States need to service debt accumulated during the conflict, and wars can also spur permanent institutional changes. Mass-mobilization wars create political consensus for egalitarian taxation systems and franchise expansion.[40] These changes create pressure to sustain programs of social redistribution, which require high taxes to fund, that emerged during the war.[41] Besley and

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[38]**??**.

[39]**?**Centeno 2002.

[40]Scheve and Stasavage 2016.

[41]**?**.

Persson formalize the war-demand logic.[42] The key choice in their model is government investment in future tax-collection capacity. A high valuation for public goods in "common-interest states" increases the value of future revenues, which boosts incentives for fiscal investments. External threats correspond with a high value of their public goods parameter.[43]

Despite highlighting some important elements, the bellicose perspective cannot explain the great revenue divergence on its own. Why did the Western revenue advantage remain large after its former colonies gained independence, which sparked high demand outside the West? For example, between 1940 and 1975, India fought in a world war under threat of invasion (during which it raised the largest volunteer army in world history), achieved independence alongside mass franchise expansion and an ascendent political elite strongly committed to social welfare measures, and engaged in three wars with Pakistan. Yet per–capita central government revenue intake was 67 times higher in Western Europe than India in 1969. Similar international pressures in the twentieth-century Middle East[44] and nineteenth-century South America[45] also failed to engender sustainably large revenue collection.

Some scholarship in the bellicose tradition incorporates additional factors that condition the effort of war on revenue collection. Examples include the presence of parliamentary institutions and level of urbanization (**?**), a pre-existing political union between the military and dominant social class (Centeno, 2002), and access to international debt markets (Queralt, 2019). The latter factor in particular likely provides a contributing factor to understanding the great revenue divergence. However, without incorporating bureaucratic capacity into bellicose theories, we cannot simultaneously explain why a large revenue divergence arose and became permanent in the twentieth century.

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[42]**?**.

[43]**?**, 46-7, 58.

[44]**?**.

[45]Centeno 2002.

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2.2 Fiscal Supply

Other scholars focus on the supply of fiscal institutions that facilitate revenue collection. The core element of fiscal, or bureaucratic, capacity is information about where citizens and other producers live and how much they produce. Standardized records enable bureaucrats to determine appropriate tax quotas and to sanction non-payers effectively, and make society "legible."[46] In low-legibility societies, citizens and other producers can exit by either physically migrating or engaging in informal economic activity beyond the state's reach. Throughout history, states have needed some bureaucratic capacity to collect taxes on land and to directly tax production. Modern income and value-added taxes are even more information-intensive.

Although the concept of bureaucratic capacity is inherently multi-faceted, recent research measures key components of states' information-collection abilities across broad comparative samples. Brambor et al. collected data on civil registration systems and state statistical offices dating back to the eighteenth century.[47] Data on births, deaths, and marriages is essentially a precondition for effective direct taxation because otherwise bureaucrats face difficulties to simply identifying the citizenry. Similarly, Lee and Zhang compiled data on the effectiveness of censuses in the twentieth century, which correlates strongly with public goods provision.[48]

Fiscal *capacity* differs from revenue *intake*. States can collect information about production and life events (birth, death, marriage) without using it for taxation. States can govern a literate population capable of filling out written tax forms, without requiring them to do so. In such scenarios, fiscal capacity is *latent* and ready to use when the ruling group wishes.

Despite adding another important piece, analyses of fiscal supply also offer incomplete explanations for the great revenue divergence. Why did a large and permanent divergence not occur earlier? For most of the nineteenth century, Western countries outpaced others in terms of collect-

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[46]**???**.

[47]Brambor et al. 2020.

[48]**?**.

ing information about their citizens and educating their population. Britain imposed the world's first modern income tax during the Napoleonic Wars. However, it suspended the income tax after the wars, and did not match its 1810 per–capita revenue record until 1915. Britain's high fiscal capacity remained largely latent throughout the nineteenth century. Similarly, other Western European countries improved their tax bureaucracies during the nineteenth century but underutilized their potential until the twentieth.

2.3   Sources of Fiscal Capacity

Conceptually, it is useful to distinguish war-based pressures from bureaucratic capacity. Yet empirically, these factors are not completely independent of each other. A key idea in bellicose theories of European state building is that participation in wars encouraged states to improve their bureaucracies. We agree that war is one important contributor to improvements in bureaucratic capacity over the longer run. This helps to explain why latent revenue-raising capacity was higher in the West than most of the rest of the world following the Napoleonic Wars. However, bellicose theories of fiscal-capacity investments cannot answer key questions about how fiscal capacity can increase in the absence of warfare, or can fail to increase for countries within a competitive international system.

Our empirical examination begins in the early nineteenth century. At this time, historical participation in wars had likely contributed to a divergence in bureaucratic capacity between European countries and much of the rest of the world. European history provides numerous examples of states enacting bureaucratic reforms to gain a coercive edge. For example, Britain introduced the Bank of England in 1694 during the Nine Years' War with France, which created a major financing advantage.[49] Similar pressures during the Napoleonic Wars propelled Britain's first income tax. Mann examines several great powers (Britain, France, Prussia, Austria) and argues that war-

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fare stimulated bureaucratic reforms before the French Revolution.[50] These reforms introduced standards for hiring and promotion, and shifted toward salaried rather than office-owning state officials.

However, even for explaining historical levels of fiscal capacity in Europe, purely bellicose theories are incomplete. Battles occurred as often in China as they did in Europe between 1000 AD and 1800,[51] and other aspects of their regional state systems influenced why bureaucratic capacity grew in Europe but fell in China.[52] Nor was the effect of war uniform throughout European history. Wars often generated crippling debt and encouraged leaders to take irresponsible actions such as debasing the currency (e.g., Louis XIV in France), as opposed to promoting fiscal systems that could generate consistent tax revenues over the longer term. Even in cases like Britain where scholars largely agree that participation in wars contributed to bureaucratic development in the eighteenth century, they also expound specific scope conditions such as early centralization, island location, and the *lack* of participation in wars during the early part of the Military Revolution.[53]

Even more pertinent for our empirical analysis, bellicose theories cannot account for two facts about fiscal capacity development in the nineteenth and twentieth centuries. First, at the beginning of the nineteenth century, no Western state (with the possible exception of Britain) possessed a "modern" bureaucracy. The historically unprecedented revenue increases that began during World War I would not have been possible without intensive improvements in fiscal capacity throughout the nineteenth century. Yet Western European states fought few wars with each other between 1816 and 1913. Why did fiscal capacity grow during an extended period of low warfare?[54]

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[50]**?**, 444-78.

[51]**?**.

[52]Hoffman 2015. See **?** for a complementary discussion of how Japan and Korea built bureaucratic capacity in the first millennium AD. Despite not typically facing a threat of Chinese invasion, mimicking China's institutions solidified the domestic power of the ruling coalitions in Japan and China.

[53]**?**.

[54]During this period, Brambor et al. 2020, 202 find that participation in warfare is uncorrelated

Second, many ex-colonies faced high fiscal demand following independence from European powers. In some cases, high demand stemmed from a competitive regional environment and bellicose pressures. Why did most of these states fail to develop strong bureaucracies?

3 Overview of Theoretical Premises

To unravel the puzzle of the great revenue divergence, we develop a theoretical framework that combines bellicose and state-legibility factors. A government chooses how to raise revenues, and citizens decide whether to comply with tax demands or exit the formal economy. The strategic interaction occurs over two periods. We first motivate the core premises of the theory. In the next section, we present and solve a game-theoretic model.

3.1 Structure of the Tax System

The government chooses among three options for structuring the tax system. The first option is to exert low fiscal effort, such as relying on existing infrastructure to collect *customs revenues*. Collecting customs taxes requires relatively few agents at one or several major ports. These indirect taxes are easy to collect if the economy is already organized in a manner to facilitate international trade. This was true of Western states by the nineteenth century. In many colonies and ex-colonies, intervention by the colonizer restructured the economy to produce certain cash crops. Centeno notes the contrast between "administratively simple but inelastic customs taxes" and "more politically challenging, but potentially more lucrative, domestic sources of revenue," which require

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with information-capacity levels; in fact, their coefficient estimate is negative. **?** show that warfare was not a major driver of fiscal expansion in European countries during the long nineteenth century. **?** argues that although wars propelled bureaucratic reform in the eighteenth century, this factor was unimportant in much of the nineteenth century.

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greater bureaucratic capacity to collect.[55]

Low fiscal effort carries two drawbacks. First, low fiscal effort may not meet societal demand for revenues. Second, despite requiring low administrative effort, narrowly based taxes such as customs taxes often entail higher deadweight loss than more broadly based taxes such as an income tax.[56] Customs taxes can also create adverse distributional consequences for the ruling elite relative to an income tax.[57] As we discuss later, this created an impetus to reform tax systems in nineteenth-century Europe, despite the absence of strong war pressures.

These drawbacks may propel governments to choose either of two high-effort strategies. On the one hand, they can target a subset of producers to offer economic privileges (e.g., state-run monopolies or crony-owned firms) in return for revenue. This strategy can be lucrative because the government concentrates economic gains among highly legible cronies. However, what we classify as *crony-favoring extraction* entails high effort because it requires significant state involvement in and restructuring of the economy. Such restructuring enables only highly legible citizens to produce valuable goods, or facilitates direct government control over valuable assets. The clearest examples of crony-favoring economic interventions occur when governments construct state-owned enterprises or otherwise favor monopolies in certain industries. This creates a symbiotic political relationship whereby the government easily accesses information about the firm's production, and favored firms gain economic advantages. Collectivized agriculture in the Soviet Union provides an extreme example. More typical cases are ones like Egypt and India in which the government actively intervenes in the economy to create a "captive tax base."[58] As Chaudhry describes, "In cases where the government becomes the primary employer and producer and assumes the role of setting prices, its task is simplified to monitoring the activities of corporations and agencies that it owns and manages."[59]

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[55]Centeno 2002, 104.

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[58]?, 134.

[59]?, 252.

On the other hand, the government can create widespread economic rights and attempt to tax this broader base. *Legibility-intensive extraction* requires information about the populace as a whole. Efficient collection of income taxes and value-added taxes requires detailed information about the identities and productivity of citizens and firms, as well as complex bureaucracies to collect and process this information.

3.2   Bureaucratic Capacity

One factor that influences the government's strategy for raising revenues in each period is bureaucratic (or fiscal) capacity, about which we make two assumptions. First, societal legibility sticky in the short run. Thus, the state inherits a stock of bureaucratic capacity in each period. Second, over time, states can take concerted actions to boost fiscal capacity. Hence, choosing legibility-intensive extraction in period 1 can bolster fiscal capacity in period 2.

First, the idea that bureaucratic capacity is persistent is widespread in the literature. Consequently, states facing a demand shock are rarely able to rapidly and dramatically improve societal legibility. Dincecco's discussion of the historical origins of state capacity in Europe dates back to the fall of the Carolingian Empire in the 800s and extends into the twentieth century.[60] Conversely, once created, bureaucracies tend to self-perpetuate even when fiscal demand is temporarily low. Some legibility reforms can persist without any spending at all. For example, introducing last names and addresses enables states to find and distinguish citizens.[61] This information facilitates revenue extraction, even if not used immediately.

Second, states can take concerted efforts to improve societal legibility over time. Although this can occur through various channels, we focus on learning-by-doing effects. Thus, choosing legibility-intensive extraction early on can bolster future bureaucratic capacity, similar to fiscal-capacity

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[60]Dincecco 2017. See also **?**.

[61]**?**.

investments in Besley and Persson.[62]

4 A Formal Model of Revenue-Extraction Strategies

The interaction of bellicose and state-legibility factors affects revenue intake, as we show in our formal model. Only states with high fiscal demand and high fiscal supply can achieve large revenue intake. In the short term, countries with varying levels of bureaucratic capacity may nonetheless generate similar levels of revenues, either because fiscal demand is low or because no states are greatly advantaged at collecting legibility-intensive taxes. However, over time, (exogenous) increases in demand or (endogenous) increases in bureaucratic capacity can generate a divergence in revenue collection.

Various factors can push governments to take concerted actions to increase fiscal capacity over time, including (1) relatively high initial bureaucratic stock, (2) anticipation of high fiscal demand in the future, (3) high potential for bureaucratic growth, and (4) high deadweight loss from easy-to-collect taxes. We discussed the first factor above: past participation in war contributed to the European advantage in fiscal capacity in the early nineteenth century, although other factors also influenced Europe's initial stock of bureaucratic capacity. The second factor is the same stimulant that creates "common interest states" in Besley and Persson.[63] Yet we also depart from bellicose theories by highlighting alternative features that are not intrinsically tied to high fiscal demand. Below we operationalize and elaborate upon the third and fourth factors in nineteenth-century Europe: industrialization created high potential for bureaucratic growth, and the ruling elite in many countries shifted to income taxes with low rates to reduce deadweight loss from narrowly based taxes.

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[62] **?**.

[63] **?**.

4.1 Setup

We model an interaction between a government and citizens, which unfolds over two periods. Time is denoted by $t \in \{1, 2\}$, and players value consumption equally across the two periods. The sequence of moves within each period is: (1) the government chooses how to structure the tax system, (2) the government proposes a specific tax rate to each citizen, (3) each citizen either complies with the tax and produces in the formal sector, or exits to the informal sector.

Society consists of a continuum of atomless citizens with mass N, which has a lower bound that strictly exceeds 1 (see below) and an upper bound of $\overline{N}$ (defined in Appendix C). The set of citizens is denoted as $\mathcal{N}$, and each citizen is indexed by i. In both periods, each citizen produces output worth Y_i, the value of which is determined by the government's actions (see below). Each citizen also has an exit option that yields consumption of a fraction $e_i \in (0, 1)$ of ones output.[64] The exit option is individual-specific and, in each period, is independently drawn for each citizen from a smooth density function $H(e_i)$ with positive support on $[0, 1]$.[65]

In each period, the government decides how to structure the tax system. It begins each period with an endowment of customs revenues worth $R^{\text{cus}} > 0$. One option for structuring the tax system is to exert low effort and rely solely on customs revenues. Alternatively, the government can choose either of two high-effort strategies to collect additional taxes.

First, under a *legibility-intensive* strategy, the government grants legal rights to participate in the formal economy to all citizens. This choice yields output $Y_i = 1$ for each citizen, which is subject to taxation. Due to limitations in bureaucratic capacity, the government does not know the value of the exit option for each citizen. A fraction $l_t \in (0, 1)$ of citizens are *legible*, and the government perfectly knows the value of e_i for each legible citizen. The remaining fraction $1 - l_t$ of citizens are illegible. The government knows only the prior distribution of possible values of e_i for such

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[64]We omit time subscripts on Y_i and e_i to reduce notational clutter.

[65]We write the associated pdf as h. One proof requires the additional assumption $h' \leq 0$, which, for example, the uniform distribution satisfies.

citizens. In any period that the government chooses legibility-intensive extraction, it pays a fixed cost $F \in (0, \overline{F})$, with an upper bound $\overline{F} > 0$ defined later (see footnotes 70 and 74). We interpret F as a relative cost. When political elites perceive low-effort taxes such as customs taxes as creating extreme economic inefficiencies or unfavorable distributional consequences for themselves, in effect, the cost F of shifting the tax base is lower.

Second, under a *crony-favoring* strategy, the government favors a subset of legible citizens, normalized to mass 1.[66] This could involve limiting economic production to specific cronies, or putting economic production directly under state ownership. Restructuring the economy to reduce competition enables each favored citizen to produce $Y_i = Y$, which is subject to taxation, but pushes any production by the mass $N - 1$ of non-cronies outside the reach of the state, and hence $Y_i = 0$. To make the tradeoffs non-trivial, we assume (a) the crony-favoring strategy bolsters the production of favored citizens relative to their production under legibility-intensive extraction and (b) crony-favoring extraction diminishes total output. Formally, $1 \leq Y < N$, which also forms a lower bound for N. Structuring the tax system to favor cronies also incurs a fixed cost. Despite not requiring a similar bureaucratic effort as the legibility-intensive strategy, subsidies paid to favored firms and the difficulty of displacing vested economic interests create costs for a government to actively intervene to distort market competition. To isolate the role of bureaucratic capacity in distinguishing the two high-effort strategies, we assume that the government pays the same fixed cost F in any period it chooses crony-favoring extraction.

The fraction of legible citizens, l_t, reflects bureaucratic capacity (equivalently, fiscal supply). We assume l_1 is an exogenous parameter. However, l_2 depends in part on the revenue-collection strategy in period 1. If the government chooses legibility-intensive extraction in period 1, then $l_2 = \min\{\Delta \cdot l_1, 1\}$. Higher values of $\Delta > 1$ indicate stronger learning-by-doing effects, and hence higher potential bureaucratic growth. By contrast, if the government chooses low effort or

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[66]Favored citizens are randomly drawn, and therefore have the same distribution of the exit option, $H(e_i)$, as the full set of citizens.

crony-favoring extraction in period 1, then $l_2 = l_1$.[67] The endogeneity of l_2 to choices in period 1 is the only way in which decisions in period 1 affect those in period 2.

If, in a particular period, the government chooses a high-effort strategy for structuring the tax system, it then proposes an individual-specific tax rate $\tau_i \in [0, 1]$ to each citizen. For every legible citizen, the value of e_i is revealed before the government chooses τ_i; and for every illegible citizen, this value is revealed immediately afterwards. Each citizen knows its individual-specific values of τ_i, e_i, and Y_i when moving. Each simultaneously responds to its tax proposal either by complying and consuming $(1 - \tau_i) \cdot Y_i$, or exiting and consuming $e_i \cdot Y_i$.

The government's consumption in each period depends on revenues raised. All revenues are assumed to be spent on public goods. The government is rewarded for increasing revenue to get closer to the amount of expenditures demanded by society, denoted as R_t^{dem} for fiscal demand, and penalized for raising taxes such that total revenue exceeds the socially desired amount. The rationale here is that citizens want to fund desired public goods, but do not want to contribute taxes for undesired projects or private rents. Formally, total revenues R_t equal the customs endowment R^{cus} plus any additional taxes collected upon pursuing a high-effort extraction strategy. The government gains a marginal benefit of 1 from any (endogenously raised) taxes raised such that total revenues do not exceed R_t^{dem}, and a marginal benefit of -1 from any taxes that push total revenues above R_t^{dem}. Thus, if $R_t^{\text{dem}} < R^{\text{cus}}$, then the government gains negative utility from raising any taxes beyond the customs endowment. If instead $R_t^{\text{dem}} > R^{\text{cus}}$, then the government receives positive utility from any taxes raised up to $R_t^{\text{dem}} - R^{\text{cus}}$, and negative utility from raising any additional taxes. We

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[67] Assuming a deterministic relationship between revenue-extraction strategies and bureaucratic development reduces moving pieces, although the results would be qualitatively similar under alternative assumptions. For example, we could assume that bureaucratic capacity can atrophy over time under crony-favoring policies (e.g., India). We could also assume a small probability that states pursuing crony-favoring policies nonetheless experience a gain in bureaucratic capacity in period 2 (e.g., South Korea).

assume $R_1^{\text{dem}} > 0$ is a fixed parameter and that Nature draws $R_2^{\text{dem}} > 0$ in between periods according to a distribution described later. To parallel our assumption about how endogenous tax revenue affects the government's utility, we assume the government's marginal benefit from any exogenous customs receipts is 1. However, the precise assumption here is immaterial because the government consumes customs revenues regardless of its strategic choices. Finally, in any period in which the government chooses a high-effort strategy for structuring the tax system, it pays the fixed cost F. This subtracts from its consumption.

4.2 Short-Term Revenue Intake: Analysis of Period 2

We solve backwards to characterize subgame perfect strategies, and all proofs are in Appendix C. In period 2, the government cares solely about short-term revenue intake. We first derive maximum possible revenues, and then we explain the government's optimal approach.

Each legible citizen will comply with a tax proposal that satisfies $\tau_i \leq 1 - e_i$. Thus, maximizing revenue requires the government to set the individual-specific tax rate to make each legible citizen indifferent between complying and exiting: $\tau_i^* = 1 - e_i$. This strategy induces every legible citizen to comply.[68] By contrast, a lack of discriminating information forces the government to set the same tax rate for each illegible citizen. The optimal rate balances two considerations. A higher tax rate yields a higher fraction of income, τ, from each illegible citizen who complies, but decreases the fraction of illegible citizens who comply. Only illegible citizens with low-valued exit options (relative to the tax proposal) comply, $e_i \leq 1 - \tau$. The revenue-maximizing tax proposal for illegible citizens solves:[69]

$$\hat{\tau} \equiv \arg \max_{\tau \in [0,1]} \int_0^{1-\tau} \tau \cdot dH(e_i). \tag{1}$$

Structuring the tax system to favor cronies yields a unit mass of favored citizens who each produce

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[68] Any strategy profile in which citizens reject offers with positive probability when indifferent creates an open set problem for the government's offer, and hence cannot be an equilibrium.

[69] In Appendix C, we prove that the maximizer is unique and strictly bounded between 0 and 1.

$Y_i = Y$ and are perfectly legible, and the remaining mass of $N-1$ citizens produce $Y_i = 0$. Legibility-intensive extraction enables all citizens to legally produce $Y_i = 1$, but only a fraction l_2 are legible. If the government makes the revenue-maximizing tax proposal to each citizen, expected revenues under each way to structure the tax system are:

$$R^{\text{crony}} = Y \cdot \underbrace{\int_0^1 (1 - e_i) \cdot dH(e_i)}_{\text{All favored citizens are legible}}. \tag{2}$$

$$R^{\text{leg}}(l_2) = N \cdot \left[\underbrace{l_2 \cdot \int_0^1 (1 - e_i) \cdot dH(e_i)}_{\text{Legible citizens}} + \underbrace{(1 - l_2) \cdot \int_0^{1-\hat{\tau}} \hat{\tau} \cdot dH(e_i)}_{\text{Illegible citizens}} \right]. \tag{3}$$

Comparing these two terms shows that legibility-intensive revenue extraction yields higher revenues than crony-favoring policies if and only if bureaucratic capacity is high enough.

Lemma 1 (Maximum tax extraction). *A unique threshold $\bar{l} \in (0,1)$ exists such that $R^{\text{leg}}(\bar{l}) = R^{\text{crony}}$. Given this threshold, we can express maximum tax revenues in period 2 as:*

$$R_2^{\text{max}} = \begin{cases} R^{\text{crony}} & \text{if } l_2 < \bar{l} \\ \\ R^{\text{leg}}(l_2) & \text{if } l_2 \geq \bar{l}. \end{cases} \tag{4}$$

This result establishes the importance of fiscal supply. The next question is whether it is optimal for the government to maximize revenues, which depends on fiscal demand. If $R_2^{\text{dem}} < R^{\text{cus}}$, then the government can fund all desired expenditures while exerting low effort at tax collection. At the other extreme, if $R_2^{\text{dem}} > R^{\text{cus}} + R_2^{\text{max}}$, the government taxes maximally. Within these lower and upper bounds, if fiscal demand is close to R^{cus}, then the fixed cost deters the government from pursuing high-effort extraction. If instead fiscal demand is close to $R^{\text{cus}} + R_2^{\text{max}}$, then the government pays the fixed cost for either legibility-intensive or crony-favoring extraction, but intentionally sets taxes to collect less-than-maximum revenues. Proposition 1 presents a subgame perfect Nash equilibrium strategy profile.[70]

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[70]To eliminate strategically uninteresting cases, we restrict the upper bound on the fixed costs

Proposition 1 (Optimal revenue extraction in period 2).

- ***Low fiscal demand.*** *If $R_2^{dem} \leq R^{cus} + F$, then the government structures the tax system to exert low effort at tax collection, which yields $R_2 = R^{cus}$.*

- ***Intermediate fiscal demand.*** *If $R^{cus} + F < R_2^{dem} < R^{cus} + R_2^{max}$, then the government structures the tax system to exert high effort at tax collection. If $l_2 < \bar{l}$, the specific mode is crony-favoring; and legibility-intensive otherwise. The government sets $\{\tau_i\}_{i \in \mathcal{N}}$ to achieve total tax intake of $R_2^{dem} - R^{cus}$. This yields less-than-maximum revenues, $R_2 = R_2^{dem}$.[71]*

- ***High fiscal demand.*** *If $R_2^{dem} \geq R^{cus} + R_2^{max}$, then the government structures the tax system to exert high effort at tax collection. It sets $\tau_i = 1 - e_i$ for each legible citizen and $\tau_i = \hat{\tau}$ (see Equation 1) for each illegible citizen, which maximizes tax intake.*

  - ***Low fiscal supply.*** *If $l_2 < \bar{l}$, then the specific mode of high-effort extraction is crony-favoring and total revenues are $R_2 = R^{cus} + R^{crony}$.*

  - ***High fiscal supply.*** *If $l_2 \geq \bar{l}$, then the specific mode of high-effort extraction is legibility-intensive and total revenues are $R_2 = R^{cus} + R^{leg}(l_2)$.[72]*

- ***Citizens' responses.*** *Each citizen complies with any tax proposal satisfying $\tau_i \leq 1 - e_i$, and exits otherwise.*

Overall, existing bellicose arguments are correct that high fiscal demand stimulates governments to collect more revenues. However, by not incorporating the supply side of revenues, they cannot tell us the means by which governments will attempt to raise revenues nor how successful they will be. For states with low bureaucratic capacity that face a demand shock, distorting the economy yields greater revenue intake than attempting to tax a broader base. Yet in equilibrium, a government with high bureaucratic capacity that chooses legibility-intensive extraction will bring

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such that $\overline{F} < R^{crony}$. This ensures that the fixed costs are not high enough, on their own, to deter high-effort extraction.

[71]For reasons described in the appendix, a continuum of actions yield payoff-equivalent equilibria in this parameter range.

[72]Note that when fiscal demand R_2^{dem} is intermediate or high, the optimal choice for structuring the tax system does not depend on F. The government compares the expected utilities from legibility-intensive and crony-favoring extraction, and F cancels out because the fixed cost is identical for each.

in more revenues than a low-capacity government that chooses crony-favoring extraction, even though both are acting optimally given their stock of bureaucratic capacity. To see why, recall the (substantively plausible) assumption that a broader-based economy yields a larger potential tax base, $Y < N$. This implies that revenues from crony-favoring extraction form a lower bound for maximum revenues. The government chooses legibility-intensive extraction only if this strategy yields higher revenues than this lower bound (see Lemma 1).

4.3   Investments in Fiscal Capacity: Analysis of Period 1

In period 1, the government cares not only about how the structure of the tax system affects contemporaneous revenues, but also revenue intake in period 2. The core implication is qualitatively unaltered: only governments with high fiscal demand and (the potential for) high fiscal supply choose legibility-intensive extraction. However, the threshold for "high" fiscal supply (i.e., bureaucratic capacity) is lowered because the shadow of the future heightens incentives to pursue legibility-intensive extraction. To make the analysis parallel with the preceding section, we characterize threshold values of initial bureaucratic capacity that determine optimal actions. We then take comparative statics on other variables that influence the government's calculus for investing in fiscal capacity.

If the starting level of bureaucratic capacity takes an extreme value, then the government's choice for how to structure the tax system in period 1 does not influence its choices in period 2. Suppose initial societal legibility is very high, $l_1 > \bar{l}$ (see Lemma 1 for this threshold). This guarantees that legibility is high enough in period 2 that, regardless of the government's actions in period 1, legibility-intensive extraction yields more revenues than crony-favoring extraction. If instead initial legibility is very low, $l_1 < \underline{l} \equiv \frac{\bar{l}}{\Delta}$, then the converse implication is true. Even if the government gets the learning-by-doing boost to bureaucratic capacity in period 2, crony-favoring extraction would yield more revenue than legibility-intensive extraction.

Only if initial legibility is between these two thresholds does the shadow of the future yield new

insights. To illuminate the substantively important insight, we focus on the following specific case within the range $l_1 \in \left(\underline{l}, \bar{l} \right)$. Fiscal demand is low in period 1, $R_1^{\text{dem}} < R^{\text{cus}}$. This ensures that the government will not seek additional revenues in period 1 beyond the customs endowment, even if it chooses to invest in fiscal capacity. This is the interesting case illuminated by the dynamic analysis because, in a single-shot game, the government would never choose legibility-intensive extraction if fiscal demand is low. We also assume that Nature draws fiscal demand for period 2 $\left(R_2^{\text{dem}} \right)$ from a Bernoulli distribution that takes value $R_{\text{high}}^{\text{dem}}$ with probability $p_{\text{high}} \in (0, 1)$, and $R_{\text{low}}^{\text{dem}}$ with complementary probability. We set these values so that for a low draw of fiscal demand, the government chooses a low-effort tax structure and does not seek additional revenues in period 2 beyond the customs endowment; and for a high draw of fiscal demand, the government seeks maximum extraction. The formalization of these thresholds follows directly from Proposition 1: $R_{\text{low}}^{\text{dem}} < R^{\text{cus}} + F$ and $R_{\text{high}}^{\text{dem}} > R^{\text{cus}} + R^{\text{leg}}(1)$.[73]

If the government chooses legibility-intensive extraction in period 1, then its total expected consumption across the two periods is:

$$\underbrace{R^{\text{cus}} - F}_{\text{Period 1}} + \underbrace{R^{\text{cus}} + p_{\text{high}} \cdot \left[R^{\text{leg}}\left(\min\{\Delta \cdot l_1, 1\} \right) - F \right]}_{\text{Period 2}}. \tag{5}$$

If instead the government does not invest in bureaucratic development in period 1, then its expected utility is:

$$\underbrace{R^{\text{cus}}}_{\text{Period 1}} + \underbrace{R^{\text{cus}} + p_{\text{high}} \cdot \left(R^{\text{crony}} - F \right)}_{\text{Period 2}}. \tag{6}$$

Comparing these two terms uncovers the conditions under which the government invests in fiscal capacity for period 2: legibility-intensive extraction (after getting the learning-by-doing boost) must yield sufficiently more revenues than crony-favoring extraction. Equating the two preceding expressions enables us to define an implicit threshold $\hat{l}$ that determines whether the government

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[73]For the lower bound of $R_{\text{high}}^{\text{dem}}$, note that $\max\{R^{\text{crony}}, R^{\text{leg}}(l_t)\}\big|_{l_t \in [0,1]} = R^{\text{leg}}(1)$.

makes this investment:[74]

$$R^{\text{leg}}\big(\Delta \cdot \hat{l}\big) = R^{\text{crony}} + \frac{F}{p_{\text{high}}}. \tag{7}$$

As in the period 2 analysis, the stock of bureaucratic capacity influences the government's optimal revenue-raising strategy. However, in period 1, the government may choose legibility-intensive extraction even if fiscal demand is low and crony-favoring extraction yields higher maximum revenues. The future gains created by bureaucratic growth change the government's calculus. Proposition 2 formalizes this intuition.[75]

> **Proposition 2** (Optimal fiscal capacity investments). *Suppose $l_1 < \bar{l}$. Assuming the scope conditions for the special case described above, the government chooses legibility-intensive extraction if and only if $l_1 > \hat{l}$ (defined in Equation 7). This threshold satisfies $\hat{l} > \underline{l}$ for all parameter values, and $\hat{l} < \bar{l}$ for low-enough F.*

We now take comparative statics on factors that determine when the government invests in fiscal capacity in period 1. Given the preceding proposition, it is immediately apparent that higher levels of initial bureaucratic stock encourage fiscal capacity investments. We discussed the empirical application of this result above: various factors, including past participation in warfare, precipitated higher l_1 in Western than non-Western countries in the early nineteenth century. In Proposition 3, we analyze three additional factors that increase the range of parameter values in which the government invests in fiscal capacity (i.e., decrease $\hat{l}$). One is a greater likelihood that fiscal demand is high in the future. This recovers a core result from Besley and Persson,[76] and highlights how the anticipation of future wars (or other sources of high fiscal demand) can propel fiscal capacity investments.

The other comparative statics results in Proposition 3 reflect factors that are independent of war:

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[74]To ensure that $\min\{\Delta \cdot \hat{l}, 1\}$ is interior, we need to place another restriction on the upper bound $\overline{F}$, which we discuss in the appendix.

[75]The proposition characterizes only the optimal investment decision. The thresholds that characterize the full set of equilibrium actions are intuitive given the preceding analysis of period 2.

[76]**?**.

greater potential for bureaucratic growth (higher Δ) and lower costs to implementing legibility-intensive extraction (lower F). Later we discuss why these factors propelled investments in fiscal capacity in nineteenth-century Europe. Industrialization and urbanization made it, in principle, easier to collect information about citizens. This increased the returns to developing a meritocratic bureaucracy, hence raising Δ. Additionally, elites became increasingly concerned about the deadweight losses and adverse distributional consequences of customs taxes, relative to income taxes. A more costly status quo made elites more willing to tolerate the disruption created by reforming the tax system, hence lowering F.

Proposition 3 (Comparative statics on fiscal capacity investments). *Each of the following changes in parameter values decrease $\hat{l}$:*

- *Higher p_{high}*
- *Higher Δ*
- *Lower F*

4.4 Implications for Revenue Divergence

The model explains why increases in fiscal demand over time can create a revenue divergence between states that vary in bureaucratic capacity. High-capacity states distinguish themselves in revenue collection only when fiscal demand is high.[77]

In Figure 3, we depict hypothetical revenue trajectories for two countries that are identical except in their initial level of bureaucratic capacity, one with low $l_1 < \hat{l}$ and one with intermediate $l_1 \in (\hat{l}, \bar{l})$. We assume that fiscal demand is low for both in period 1. Consequently, neither government raises revenue beyond their endowed customs taxes. However, the government with intermediate initial bureaucratic capacity (solid line) nonetheless will sink the fixed cost to create future foundations for legibility-intensive extraction. By contrast, the low-legibility state (dashed

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[77]Footnote 67 highlights that adding stochastic elements to the model would not qualitatively change the core intuitions.

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line) has no incentive to invest in future fiscal capacity despite anticipating an identical probability of high fiscal demand in period 2. The learning-by-doing effects from investing in bureaucratic capacity are sufficiently small that this government would continue to respond to high fiscal demand in the future with crony-favoring extraction.

[FIGURE 3 ABOUT HERE]

If Nature draws high fiscal demand for both governments in period 2, then revenue divergence occurs. Although both extract maximally, the government with higher bureaucratic capacity chooses legibility-intensive extraction and gains higher revenue intake.[78] By contrast, the low-legibility state chooses crony-favoring extraction. Existing models, such as Besley and Persson,[79] cannot account for this divergence. In their model, any state that anticipates high fiscal demand in the future is a "common value state" that will invest in fiscal capacity to capitalize on demand shocks. However, in our model, bureaucratic capacity conditions the effect of demand shocks. In the short term, low fiscal supply pushes high-demand states toward crony-favoring rather than legibility-intensive extraction. In the long term, states with poor prospects for bureaucratic growth will have lower incentives to invest in fiscal capacity even if they anticipate high fiscal demand in the future.

5   Empirical Evidence for Theoretical Implications

Our main theoretical implication is that large revenue intake requires the conjunction of high fiscal supply and high fiscal demand. Evidence from the nineteenth and twentieth centuries supports this expectation. Western countries enjoyed an advantage in bureaucratic capacity, which grew over time. However, fiscal demand was low until World War I. Numerous non-Western primary product exporters and some agrarian empires kept pace or caught up with the West. Later, high

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[78]For these parameter values, the higher-capacity state would not choose legibility-intensive extraction in period 2 absent investment in bureaucratic capacity in period 1.

[79]**?**.

fiscal demand in the West propelled these states to capitalize on their latent advantages in fiscal capacity. Huge discrepancies in revenue collection emerged relative to non-Western countries. After independence, their colonies also experienced demand shocks. However, low supply prevented high levels of revenue collection, which explains why the large revenue divergence was permanent.

In Appendix B, we propose one way to operationalize fiscal demand and supply for a large-N sample. Using two-way fixed-effects models, we demonstrate that participation in war (which proxies for demand shocks) exhibits a positive and statistically significant association with revenues only in countries with an experienced civil registration system (which proxies for high bureaucratic capacity). Thus, the interaction effect is positive.

5.1 Low Fiscal Demand in the Nineteenth-Century West

Between the conclusion of the Napoleonic Wars and the start of World War I, revenue intake was low in Western countries. Bellicose theories anticipate this pattern because infrequent intra-European warfare lowered fiscal demand. However, despite minimal pressures from war, fiscal capacity grew throughout the century. Our theory accounts for non-bellicose stimulants to bureaucratic reform.

In Figure 4, we highlight low revenue intake in important states. Britain imposed the world's first modern income tax during the Napoleonic Wars,[80] a period we highlight in gray. However, per–capita revenue intake declined afterwards, and this decline is even more pronounced when accounting for Britain's strong economic growth. Even when Britain reimposed an income tax in 1842, the marginal rate began at 2.9%, and it remained low into the twentieth century. France imposed a new set of direct taxes starting with its Revolution, but did not implement an income tax until World War I. The United States experienced a brief spike in revenues when it imposed an income tax during its Civil War and Reconstruction (1862–72), which we also highlight in

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[80]Dincecco 2017.

gray. However, for most of the nineteenth century, the U.S. government was a "state of courts and parties." In the 1870s, customs revenues from the Port of New York accounted for more than half of all federal revenues.[81] Customs revenues were sufficient to cover the small federal budget, and during the century they constituted on average 72.1% of U.S. revenues. The major outlier among Western countries was New Zealand, which we omit from the Other Western average in the figure to not obscure the main pattern. Throughout the nineteenth century, New Zealand consistently collected high levels of customs taxes relative to the small white population.

[FIGURE 4 ABOUT HERE]

Low revenue intake reflected low fiscal demand. The long nineteenth century was more peaceful than the preceding or subsequent periods. Britain, for instance, participated in a major war against at least one other European power for 76 of the 150 years from 1665 to 1815, but in only three years between 1816 to 1913. Wars of imperial conquest or within established colonies occurred more frequently (61 years for Britain). However, these conflicts were much less costly than intra-European conflicts. For example, the First Anglo-Burmese war and the Anglo-Zulu war each cost £5 million, and the First Anglo-Afghan War cost £14 million. By contrast, Britain's participation World War I cost £3.25 billion. The main reason for lower costs was that imperial wars required small commitments from metropolitan troops.[82] To assess this claim systematically, we analyzed whether war years correlate with a larger mobilization of domestic British troops.[83] When defining "wars" as intra-European conflicts, the correlation is positive and statistically significant. By contrast, when defining "wars" as imperial, the correlation is null.

Similarly, until the very end of this period, a limited franchise dampened domestic incentives for social provision and redistributive taxation. Britain did not provide old-age pensions until 1908, unemployment insurance until 1911, or universal secondary education until 1918. Britain's upper-class political leadership would not personally benefit from heavy taxation, and they faced minimal

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[81]**?**, 24, 61.

[82]**?**, 6-10.

[83]Data from Onorato et al. 2014. Details in Appendix A.8.

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demand from their middle-class electorate to boost expenditures. Across Western Europe, demand for welfare provisions was low throughout the nineteenth century.[84]

Given low fiscal demand, bellicose theories anticipate retrenchment in Britain and many continental powers. However, these theories cannot account for why, nonetheless, fiscal capacity tended to increase during this period. All ten countries that introduced civil registration systems for births and deaths before 1850 are in Western Europe or its offshoots.[85] Age heaping in U.S. censuses declined by 62% among native whites between 1850 and 1900, with even larger improvements among other racial groups.[86] These gains were essential for enabling Western states to collect unprecedented levels of revenues when fiscal demand spiked starting in 1914.

Our model helps to explain why Western states invested in fiscal capacity despite low fiscal demand (and hence they underutilized their fiscal capacity). One relevant factor was that European countries began the period with greater fiscal capacity than most non-Western countries, that is, l_1 was high. This was, in part, of a legacy of prior wars, as discussed above. Yet two other key conditions from the model that explain bureaucratic growth were independent of war.

First, every Western country experienced industrialization prior to World War I.[87] This factor increased the potential for bureaucratic growth, which corresponds with higher Δ in the model. Industrialization reshaped citizens in ways that made it easier for states to control and tax them. Residents of cities are easier to monitor than villages, and it is easier to impose income taxes on cash wages than on harvests consumed as subsistence. The basic literacy, numeracy, and awareness of time required by industrial firms created positive spillovers for states. Zhang and Lee provide quantitative evidence that literacy is strongly associated with state capacity, and industrialization and urbanization facilitated increases in literacy.[88]

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[84]**?**.

[85]Brambor et al. 2020.

[86]**?**, 793.

[87]**?**.

[88]**?**.

Second, European states inherited irrational and inefficient state structures from the eighteenth century. This, in effect, reduced the net costs of reforming the tax system, hence lowering the fixed cost F in the model to implementing legibility-intensive extraction. Reforming the bureaucracy enabled political elites to reduce economic deadweight losses. Even the early nineteenth–century English bureaucracy, often cited as a global model, was recruited through patronage networks and purchase. Many so-called bureaucrats had sinecures and were recompensed by fees rather than salaries.[89] Statesmen took actions throughout the nineteenth century to eliminate these abuses and to recruit bureaucrats by examination.[90]

Similarly, many governing elites considered the income tax to be more equitable than the easily collected tariffs and excise taxes it replaced, which also bolstered quasi-voluntary compliance.[91] Sir Robert Peel's speech proposing the reintroduction of the British income tax in 1842 stated that the resulting surplus would be used in "making of great improvements in the commercial tariff in England; in addition to these improvements to abate the duties on some great articles of consumption,"[92] and in fact a general reduction in tariffs occurred around that time. Previously, state officials viewed the income tax as appropriate only at times of serious fiscal crises, such as wars. However, reformers like Peel argued that an income tax with low marginal rates offered a welfare-improving means to pay for the ordinary costs of peacetime administration.[93] Across the continent, landed elites often pushed for the introduction of income taxes not to finance greater social expenditures, but instead to ensure that rising capitalist elites incurred a greater share of the total tax burden.[94]

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[89]**?**.

[90]**?**.

[91]**?**.

[92]**?**, 430.

[93]For similar arguments in France, see **?**, 96.

[94]**?**.

5.2 Primary Product Exporters and Empires in the Nineteenth Century

Customs revenues in primary product exporters. Even with low demand for public expenditures in the West, we might still expect these states to collect more revenue than states then (or recently) under Western colonial rule. European colonial rule was typically based on predatory extraction, which perpetuated low fiscal supply. Colonizers shaped the fiscal systems of dependencies to reflect metropolitan objectives. Most colonies made extensive use of either coercive labor institutions or local intermediaries, both of which tended to reduce the central colonial government's cash receipts. Spanish administrators in the Americas plundered their colonies for gold and silver, often using indigenous forced labor for mining and other production purposes. Elsewhere, Europeans forcibly imported millions of Africans to work as slaves on plantations throughout the West Indies and other areas where the climate permitted the production of sugar and other valued commodities. African colonies were characterized by high labor coercion and financial decentralization.[95] Britain collected head, hut, and other direct taxes in Africa through Native Authorities acting on the state's behalf.[96] Throughout Africa, colonists co-opted local indigenous institutions and aimed simply to collect enough taxes to balance the budget. Similarly, in the majority of areas in colonial India, colonial officials delegated the collection of the land revenue tax to princes or large landlords, and the government was usually unable to raise the rates they assessed.[97]

Despite not boosting legibility, European colonizers structured local economies to facilitate primary product exports. This enabled some dependencies to keep pace with the West without high fiscal effort. Europe's dominance in this period was based on superior military technology, scientific innovations and economic development, and epidemiological advantages, rather than high levels of taxation. In Figure 5, we compare Britain (black line) and average revenue intake in other Western countries (blue line) to four baskets of non-Western countries between 1800–1913. We plot individual non-Western countries in dashed gray, and their average in a thick, solid gray

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[95]**?**.

[96]**?**.

[97]**?**.

line.

[FIGURE 5 ABOUT HERE]

Countries in the Southern Cone of South America gained independence in the first half of the nineteenth century. On average, their revenue intake was relatively high. Between 1900–13, the Southern Cone countries collected 33% more in revenue per capita than Britain, and more than twice the amount of revenue of other Western countries, on average. Measuring taxes as a percentage of GDP reveals similar discrepancies. Whereas Britain and the average of all other Western countries each raised 6.4% of GDP in taxes, the corresponding figure for Southern Cone countries was 9.2%. Revenues were particularly high in Chile, which reflected a boom in nitrate mining.[98] Between 1900–13, customs taxes constituted, on average, 71.3% of Chile's total revenues. In addition to the ease for primary product exporters to collect customs taxes from a handful of ports, high demand also contributed to revenue extraction in Chile. Victory in the War of the Pacific (1879–83) cemented the influence of domestic coalitions that favored an expansive, extractive state.[99]

In Panels B and C, we plot revenues from territories that were, at the time, subjected to colonial occupation. We distinguish between two types of colonies: plantation colonies in which a high fraction of the population was forced migrants engaged in production of cash crops on plantations, and colonies of occupation with largely indigenous populations. Plantation colonies, with more direct rule and high levels of trade, collected somewhat less revenue than European countries: from 1900–13, 55% less than Britain, and 31% less than other Western European countries.[100] However, these gaps are strikingly small compared to modern discrepancies or when considering the vastly superior bureaucratic institutions in the West. Furthermore, when normalizing by GDP, the advantage flips. Plantation colonies collected 72% more than Britain, and more than two times

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[98]**?**.

[99]Schenoni 2021, 418-19.

[100]These differences in per–capita revenue collection, as well as those for occupation colonies (see below), are similar in magnitude to **?** estimates, who compiled his revenue data for the British empire from colonial Blue Books.

the average of other Western European states.[101]

Western countries were clearly distinguished from occupation colonies in revenue intake, even before World War I. Between 1900–13, Britain collected nearly thirteen times more in revenue per capita than occupation colonies, and other Western countries collected eight times more. Yet once again, these magnitudes were small by modern standards, and differences in GDP account for most of the discrepancy. When normalizing by income, Britain collected only two times more in revenue than occupation colonies, and the rest of the West collected only 65% more than occupation colonies.[102]

One possible concern is that comparing sovereign and non-sovereign polities yields misleading conclusions. Specifically, perhaps colonizers exploited their colonies to fund expenditures at home, which would enable them to keep domestic taxes low. However, this alternative explanation is unlikely to explain away the patterns presented here. It cannot explain why independent states in the Southern Cone extracted large amounts of revenue, nor why occupation colonies in Africa and Asia extracted minimal revenue. Research by economic historians shows that in the largest empires (Britain and France), colonial subsidies and defense expenditures exceeded in magnitude any revenue intake, which departed from the goal of financial self-sufficiency in the colonies. Analyzing Britain in the half century preceding World War I, Davis and Huttenback argue that the empire is better characterized as "a redistribution of income within the United Kingdom than as a transfer from the empire to the mother country."[103] Although many European investors benefited

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[101]We lack taxes/GDP data for these observations; see Appendix A.1 for a discussion of our normalized revenue variable.

[102]Despite broad coverage of revenue data, we lack GDP data for most occupation colonies (only India, Indonesia, and Sri Lanka). However, these colonies are not outliers in revenue collection. Between 1900–13, these three colonies collected, on average, 33% more in per-capita revenues than the entire group of occupation colonies. This suggests that differences in GDP between Western countries and occupation colonies explain most of the gap in per–capita revenue intake.

[103]?, 119.

from colonial rule, this was possible because of the security environment funded by metropolitan taxpayers. Only in the small empires with one or several profitable colonies (Dutch, Belgian, Portuguese) did the empire contribute a significant net inflow to the metropole, mirroring patterns from imperial Spain in earlier centuries.[104] These authors also stress that "colonial revenues were first and foremost needed to secure *internal* order ... [and] to pay the salaries of government officials who administered the government departments."[105]

Reforms in non-Western empires. In the final panel in Figure 5, we compare the West to major non-Western empires. Many scholars highlight a large gap in revenue intake between the West (in particular Britain) and major non-Western empires at the end of the eighteenth century.[106] Despite this early mini-divergence, by the beginning of the twentieth century, the gap had narrowed between these empires and the West. We attribute this pattern to high fiscal demand, which stimulated either legibility-intensive extraction (Japan) or crony-favoring extraction (Russia and Egypt).

We have data for three major non-Western states before World War I: Egypt, Japan, and Russia.[107] Like several other empires (China, Ethiopia, Ottoman, Siam), these states engaged in defensive modernization programs to resist Western encroachment. Their ruling elites perceived high demand for centralized revenues, even in years that these states did not actively participate in war. Reforms in Japan followed two centuries of isolation and decentralized rule under the Tokugawa Shogunate, when demand for public expenditures was low. Japan enjoyed a long history of domain-level taxation and a professional state service,[108] which facilitated the implementation of a civil registration system in 1874. Consequently, Japan caught up to the West in per–capita revenue

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[104]**?**, 6-8.

[105]**?**, 5; emphasis in original.

[106]Karaman and Pamuk 2010, 623; Rosenthal and Wong 2011, 175; Hoffman 2015, 51; Dincecco 2017, 69.

[107]In Appendix A.7, we discuss this sample of non-Western empires and the revenue data in more detail.

[108]**?**.

intake by 1913, and may have raised more when accounting for differences in GDP.[109]

Russia and Egypt highlight how crony-favoring extraction can yield comparable revenue intake to states with superior bureaucracies but that face low demand. In our dataset, Russia converged toward Western revenue intake during the nineteenth century. Our first data point is for 1815, when revenue collection in Britain was 22.6 times higher than in Russia, and in France was 3.9 times higher. This is consistent with an early revenue divergence shown by other scholars. In fact, this gap between the West and Russia at the conclusion of the Napoleonic wars is even larger than the discrepancies listed by Dincecco in the 1780s,[110] which were 6.6 and 3 for Britain and France, respectively. However, the gap narrowed considerably by the onset of World War I. In response to defeat in the Crimean War, the Russian state initiated a drive to industrialize and build railroads. To finance this drive, the Russian state engaged in various crony-favoring methods to raise revenue. In 1902, state monopolies and state domains accounted for 56% of revenues, compared to only 7% for direct taxes. The liquor monopoly (established in 1895) itself constituted 25% of total revenues.[111] Between 1900–13, Britain collected only 83% more revenue per capita than Russia, and other Western states only 27% more. Although we lack GDP data for Russia during this period, it is likely that this relatively small gap is entirely explained by income differences.

In Egypt, Muhammad Ali unleashed an ambitious program to reform the military and economy. He engaged in bureaucratic reforms, but the state administration remained highly personalized. Instead, consistent with a crony-favoring strategy, he ordered the cultivation of numerous cash crops (in particular cotton) and established monopolies to buy them at low prices from peasants and then sell them on the world market for a profit.[112] In the 1870s, Western countries collected 62% more in revenue per capita than Egypt, and Egypt collected slightly more in normalized

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[109]The datasets we use exhibit discrepancies on the latter point. Although Japan raised less on Andersson and Brambor's (2019) taxes/GDP measure, it raised more on Beramendi et al.'s (2019) taxes/GDP measure and our normalized revenue measure.

[110]Dincecco 2017, 69.

[111]Calculated by the authors from *The Statesmans Yearbook* for 1904.

[112]**?**, 84, 91.

revenue.

5.3 Surging Revenues in the Twentieth-Century West

Starting with World War I, Western governments experienced permanently high demand for revenues. This change in conjunction with their bureaucratic foundations for effective legibility-intensive extraction yielded sustainably large revenue intake, as we demonstrated in Figure 1.

The two world wars required unprecedented mobilization of troops, reorganization and management of the economy to supply the war effort, and financing needs. European states overhauled their tax systems,[113] and experienced pressure to expand the franchise and provide citizens with a broad array of social welfare benefits to reward their sacrifices,[114] even in countries that did not directly participate in the wars.[115] The Great Depression as well as geopolitical competition during the Cold War also stimulated demand for activist states.

The prior legacy of high bureaucratic capacity enabled Western states to capitalize on these demand shocks. Improvements in fiscal capacity during the nineteenth century, which we described earlier, were a precondition for unprecedented increases in revenue intake. Legibility-intensive extraction—in particular, income taxes—replaced narrowly based taxes as the primary revenue source in Western states. Heavily reliant on bureaucratic competency and societal legibility, income taxes represented a major technological breakthrough in taxation capacity. Mares and Queralt praise the "unprecedented revenue generating capacity" of "the most advanced fiscal instrument to date."[116] This is also true of advanced consumption taxes, such as the value-added tax that became common in Western Europe.[117] Each tax requires high social legibility to collect efficiently. Income taxes are hard to evade if citizens receive monetary income by check or transfer, and

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[113]Scheve and Stasavage 2016.

[114]**?**.

[115]See Appendix Figure B.2 for evidence on the non-belligerents in WWI.

[116]**?**, 1975.

[117]**?**.

41

value-added taxes are difficult to evade if firms routinely provide and receive invoices for sales and purchases.

In Figure 6, we present the fraction of revenue deriving from either customs or income taxes for Western states. Customs taxes once constituted the main source of revenues in Western offshoots and were also sizable in Western Europe. However, by the second half of the twentieth century, they were largely unimportant. In 1969, customs taxes comprised 6% of revenues in Western offshoots and 10% in Western Europe. By this time, income taxes were the main source of revenues for Western offshoots (69%). Income taxes were less important in Western Europe (34%) because, instead, these countries relied more heavily on advanced consumption taxes. In 1969, all direct taxes plus advanced consumption taxes constituted, on average, 54% of revenues in Western European countries.[118]

[FIGURE 6 ABOUT HERE]

5.4   Low Fiscal Capacity in Former Western Colonies

The revenue gap between the West and the rest of the world increased exponentially after World War II, when most of the colonized world gained independence, as we showed in Figure 1. Insufficient bureaucratic reforms during the colonial period offer a more compelling explanation than bellicose theories for the general inability of non-Western states after gaining independence to converge toward Western revenue intake. Despite generally high demand in the post-colonial world, inadequate bureaucratic capacity hindered revenue intake.

Under colonial rule, the predominant strategies of taxing cash-crop exports and relying on local intermediaries did not require advanced bureaucracies. For example, for direct taxation, British administrators in Africa largely relied on head or hut taxes because they were "[u]nable to collect information on individual taxpayers and their incomes." They varied the rate of taxation by district

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[118]Computed by authors by summing the relevant categories from Mitchell 1998.

based on the crude assumption that Africans "living in areas close to the railways or opportunities for wage labour could afford to pay a higher rate than those living in more remote regions."[119] Easy-revenue sources often satisfied the limited needs of colonial states before World War II, at least relative to the costs of constructing more intensive systems.

Independent countries in South America in the nineteenth century also had an alternative to building intensive bureaucracies, even when they competed in wars. Low global interest rates enabled states to pay for wars with debt, which they often renegotiated after the wars, rather than to develop intensive forms of domestic tax collection.[120] The availability of international capital reduced the elasticity problems inherent in low-legibility taxation. Instead, states could mortgage future customs and mineral revenues to gain short-term financing.

When fiscal demand rose after independence in the twentieth century, neglected bureaucratic reforms during the critical juncture of colonial rule became problematic. Most former colonies lacked a civil registration system at independence, which we use as a proxy for bureaucratic development in Appendix B, although most early-independence South American countries established a civil registration system in the late nineteenth century. At independence, India had 46 times as much census-age misreporting as the United States.[121] Given low supply, we anticipate that heightened fiscal demand after gaining independence should not discernibly boost revenue collection. Lee and Paine provide quantitative support for this contention by demonstrating null differences in countries' revenue intake before and after independence.[122]

In many post-colonial countries, low legibility persisted long after independence. Many lack extensive written or electronic records to monitor activity, or banking intermediaries that reduce the need for government agents to meet in person to collect taxes. In some African and Asian countries, customs revenues became *more* important in the mid-twentieth century. Governments gained

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[119]**?**, 116.

[120]Centeno 2002; Queralt 2019.

[121]**?**.

[122]**?**.

freedom to set tariff rates, and older land or labor taxes declined in importance or were abolished by post-independence governments intent on reforming the colonial system. Bates explains how many African rulers after independence used funds from agricultural marketing boards (which serve the ostensible purpose of stabilizing prices for and revenues from primary products) to raise revenues by exploiting farmers.[123] Even when non-Western states have tried to impose modern legibility-intensive taxes, a lack of bureaucratic capacity has often impeded collection. In 1969, the average non-Western country collected 28% of its revenues from income taxes, and 20% of its revenues from customs taxes.[124] One exception was South Africa (51% of revenues from income taxes), which was highly effective at raising taxes within the white community.[125]

Egypt and India provide striking contrast cases for bellicose theories. Despite frequent participation in international warfare, these states collect low levels of revenue. A state needs high bureaucratic capacity to make its society legible. When this condition fails, rulers turn to crony-favoring extraction. Egypt and India each faced high demand for revenue given their participation in prolonged international rivalries (with Israel and Pakistan, respectively) that on several occasions flared into war. Yet both developed large and inefficient public sectors, as opposed to cultivating more sustainable sources of revenues. "The SOE sector does represent a captive tax base, and even as the SOEs run at a loss and seek financing abroad, they still generate a predictable source of taxes and compulsory payments to various fiscal agencies."[126] Egypt's attempt to implement a broad land reform in the 1950s and 1960s, which would have cut out large landowners as intermediaries in the tax-collection process, failed due to basic problems of bureaucratic information about land titles and related issues.[127] In India, the proportion of revenue collected through direct

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[123]?.

[124]Data for eight South American countries (and Mexico) from Andersson and Brambor 2019. Other countries are authors' calculations from Mitchell 1998: Egypt, India, Indonesia, Iran, Pakistan, Philippines, South Africa, South Korea, Turkey.

[125]?.

[126]?, 134.

[127]?.

taxes fell during the twentieth century, from 28% in 1900 to 15% in 2000 and with a low of 6.5% in 1987.[128] Tax-avoidance rates remained high and the government chose to raise import duties and nationalize large sectors of the economy. In 1969, each country collected less revenue per capita than the average non-Western country, and a low share of their revenues came from income taxes (15% in Egypt and 17% in India).

The main exceptions to the general pattern of fiscal weakness in the non-Western world are the "developmental states" of East Asia. Our theory anticipates these exceptions, which combined high supply and demand. Japan, Taiwan, and South Korea all had long traditions of professionalized bureaucracies, in fact, longer than those in the West. These countries experienced high demand for revenue to fund participation in World War II, their subsequent recovery, Cold War rivalries (including the Korean War), and ambitious programs of infrastructural development and public service provision. In 1969, Japan ranked ninth globally in per–capita revenue collection, and exceeded the Western average. Japan collected 62% of its revenue from income taxes, which was in line with Western offshoots. As late as 1964, Taiwan collected less per-capita revenue than the average non-Western country, but by 1969 nearly twice as much. South Korea collected 33% of its revenues from income taxes in 1969, in line with the Western European average.[129] Taiwan and South Korea further converged to Western patterns in subsequent decades.

6   Conclusion

During the twentieth century, a historically unprecedented divergence in revenue intake occurred between Western countries and the rest of the world. Vast and permanent differences in revenue collection emerged much later than existing theories would expect. We explain the cross-

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[128]See *Statistical abstract relating to British India from 1894–95 to 1903–04*, Table 45; and *Handbook of Statistics on Indian Economy 2018–19*, Table 96.

[129]We lack internationally comparable data on per-capita revenue in South Korea because its currency was not convertible.

sectional and longitudinal trends by distinguishing existing explanations based on bellicose and state-legibility factors. Whereas most existing research examines these factors in isolation, we provide a theory of how demand shocks can cause governments to engage in either legibility-intensive or crony-favoring extraction. We show that the optimal choice depends on extant bureaucratic capacity as well as the ability to boost societal legibility in the future. We then provide empirical evidence from the nineteenth and twentieth centuries to establish that the conjunction of high fiscal demand and high fiscal supply produced sustainably high revenue increases funded by income and value-added taxes.

Our new theory and dataset enable us to push beyond particular regions, specific time periods, and individual types of taxes. We build on existing theories and empirical findings to facilitate a broad comparative analysis of transformations in revenue intake over the past two centuries. Our framework centers around the importance of bureaucratic development and states' information-gathering capabilities. Wars undoubtedly contributed to improved fiscal capacity and revenue collection in some European cases in both the early modern period and the twentieth century. However, this effect was not constant over either time or space. In many European states, fiscal capacity grew but remained latent for much of the nineteenth century. Conversely, a bellicose environment typically did not help non-Western countries to improve fiscal capacity. The main exceptions were East Asian countries, such as Japan, that experienced not only high demand, but also a prior history of bureaucratic development.

Our perspective also highlights insufficient bureaucratic development as central to understanding low taxation in the non-Western world, as opposed to states enduring too few or the "wrong" kinds of wars. In the nineteenth century, states with largely illegible societies but valuable primary products—which required minimal bureaucratic capacity to generate revenues—could keep pace with the West. However, once demand picked up across the globe, states with low fiscal capacity were heavily restricted in their ability to raise modern sources of revenues such as income taxes. Where favorable bureaucratic preconditions were absent, revenue extraction remained modest re-

gardless of the frequency or types of wars.

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Figure 1: The Great Revenue Divergence


A. Revenue per capita

B. Taxes/GDP
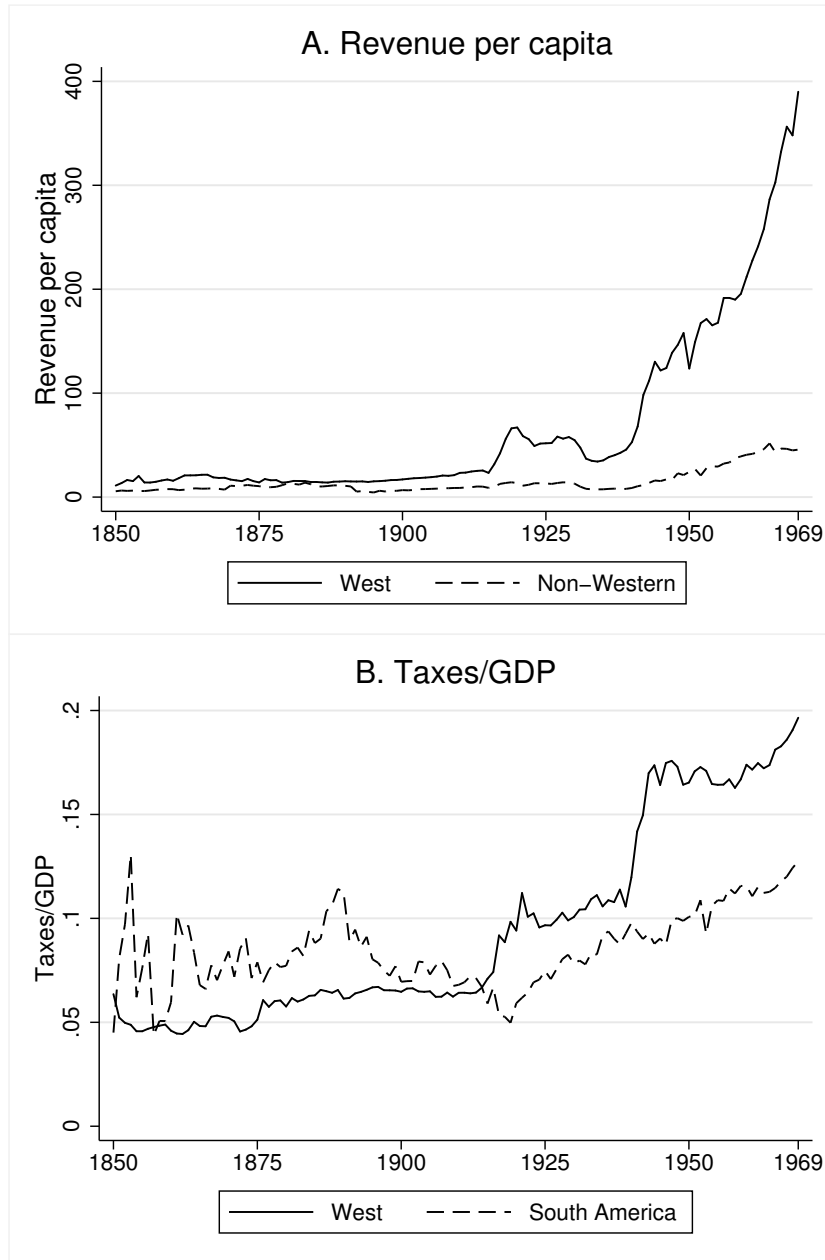
Notes. The lines depict revenue intake averaged over Western and non-Western countries. In Panel A, the measure is central government revenue per capita in gold grams (converted at nominal exchange rates), as described above. In Panel B, the measure is taxes/GDP from Andersson and Brambor 2019.

**Figure 2: Comparing Income and Revenue Divergence**
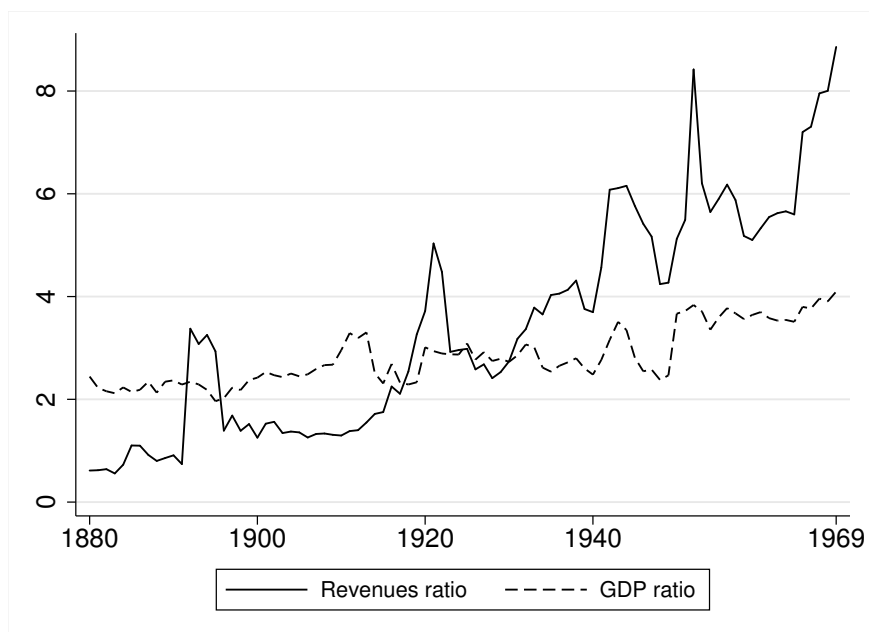
Notes. Each line divides the average value of the outcome among Western countries by the average value among non-Western countries. The solid line depicts our core measure of revenues per capita, and the dashed line depicts GDP per capita in constant 2011 U.S. dollars from Bolt et al. 2018. In this figure, we include only country-years with both revenue and income data.

Figure 3: Hypothetical Revenue Trajectories
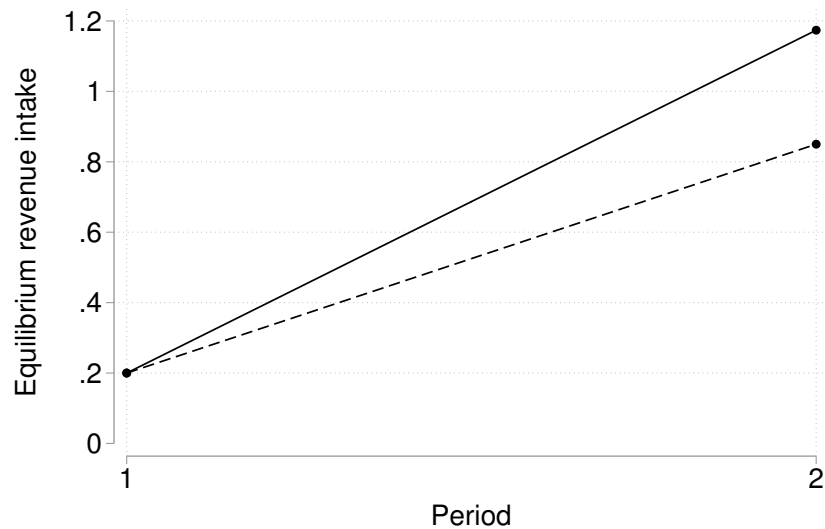
Notes. Parameters are $H \sim U(0,1)$, $N = 1.9$, $F = 0.05$, $R^{\text{cus}} = 0.2$, $Y = 1.3$, $p_{\text{high}} = 0.8$, and $\Delta = 3$. For these parameter values, the threshold values are $\underline{l} = 0.122$, $\hat{l} = 0.167$, and $\bar{l} = 0.368$. For the solid line, $l_1 = 0.35$. Any value $l_1 < \hat{l}$ yields the trajectory depicted by the dashed line.

Figure 4: Western Revenue Intake Pre-WWI

A. Revenue per capita

B. Taxes/GDP

Britain — — — — United States
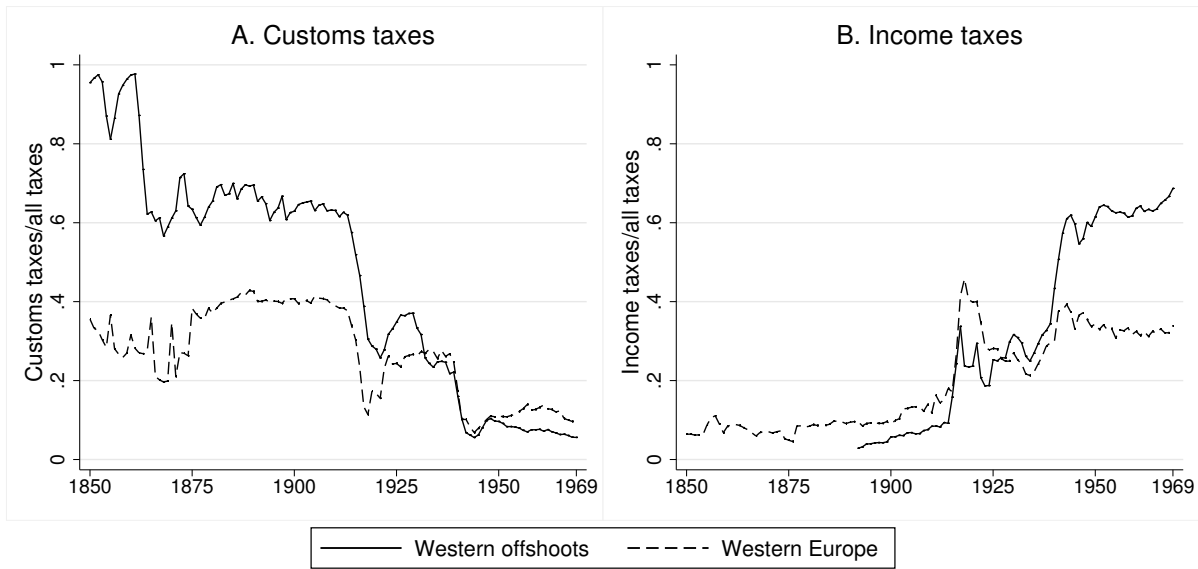France — — — — Other Western
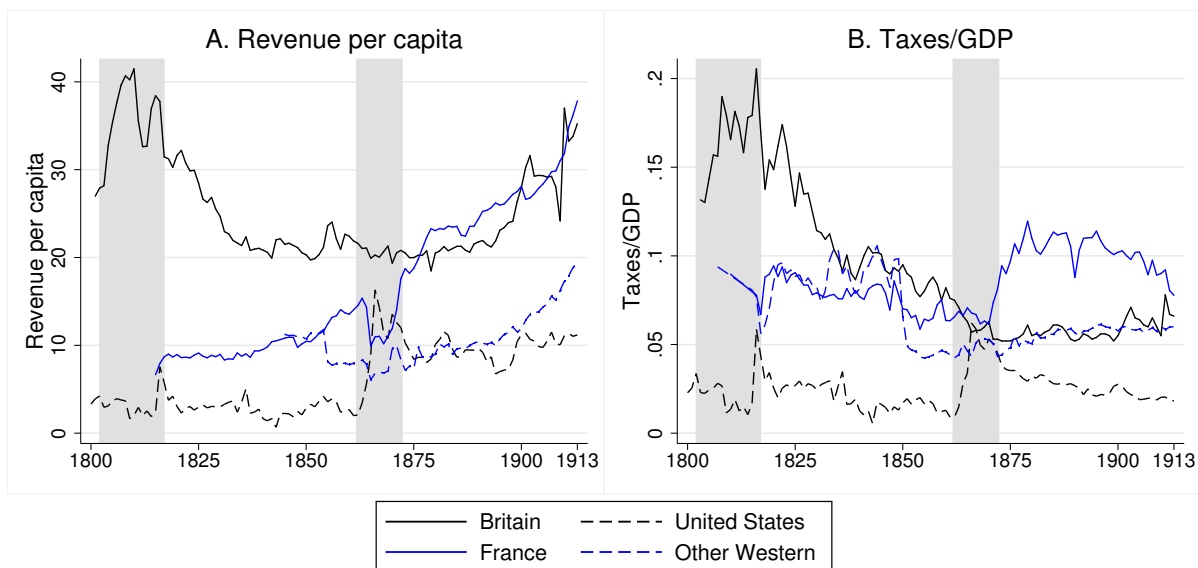
Notes. See note for Figure 1. The range of the scale for the y-axis in Panel A is one-tenth that of Figure 1.

Figure 5: Comparative Revenue Intake Pre-WWI
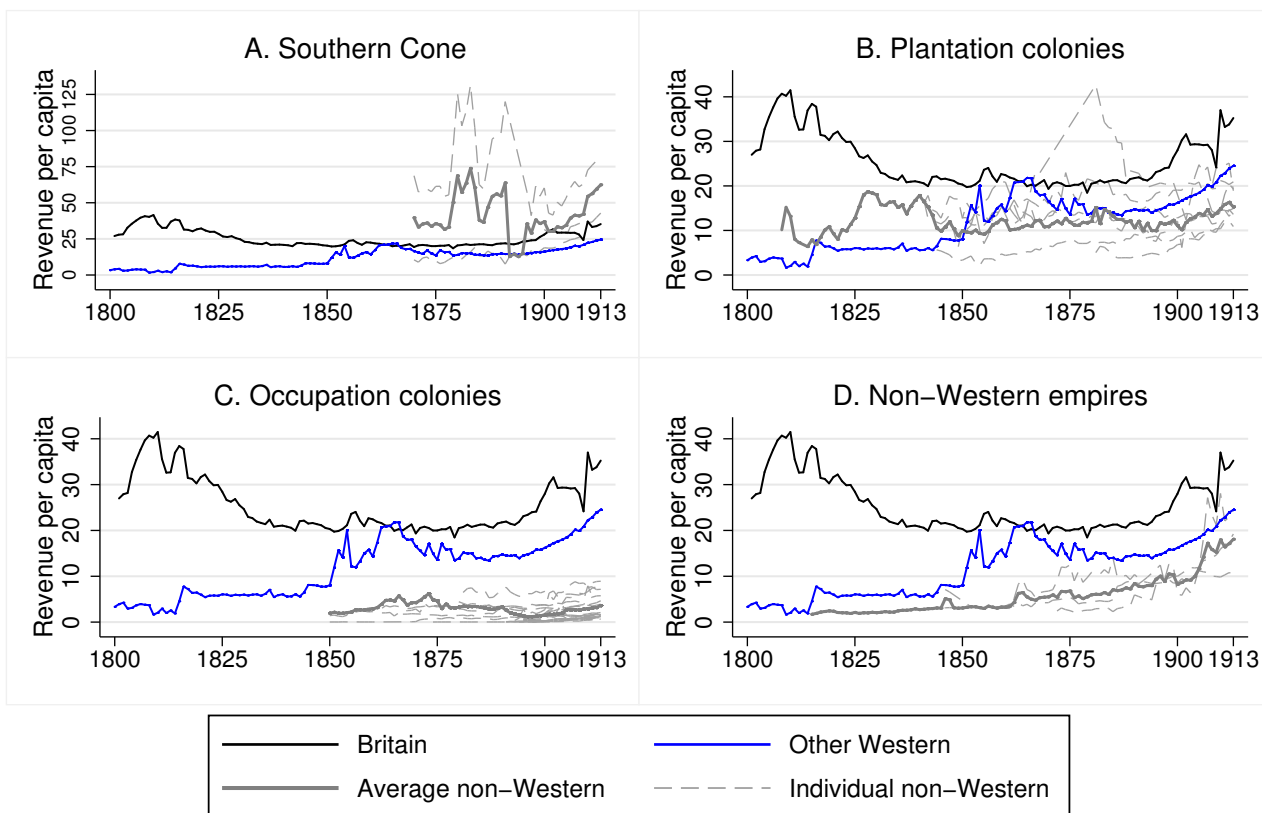
Notes. The lines show estimated central government revenue per capita in gold grams, converted at nominal exchange rates. The set of non-Western countries are as follows. Panel A: Argentina, Chile, Uruguay. Panel B: Barbados, Cuba, Fiji, Guyana, Jamaica, Malaysia, Mauritius, Trinidad and Tobago. Panel C: Algeria, Benin, Cameroon, Cyprus, Ghana, Guinea, India, Indonesia, Ivory Coast, Madagascar, Malawi, Niger, Nigeria, Senegal, Sri Lanka, Tanzania, Togo, Uganda, Zambia, Zimbabwe. Panel D: Egypt, Japan, Russia.

Figure 6: Sources of Western Revenues: Customs and Income Taxes

Notes. Data from Andersson and Brambor 2019.