Political Transformations and Economic Performance*

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Abstract

Today's advanced economies typically possess a set of political institutions that link powerful centralized tax structures with parliaments that limit executive control over public finances. This paper argues that, by enabling governments to gather large tax revenues and channel funds toward non-military public services with positive economic benefits, states with "balanced" fiscal systems improve economic performance. To make our case, we examine the economic impacts of fundamental political transformations that resolved long-standing problems of weak fiscal authority and strong executive spending control in Europe. Our database is novel and spans 11 countries and 4 centuries. A dynamic simultaneous equation panel model indicates that the performance effects of efficient political regimes are significant, large, and robust.

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JEL codes: C33, H11, H41, N43, O23, P48.

PRELIMINARY

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1 Introduction

A large literature in economics emphasizes the negative effect of executive predation on economic growth.[1] This view suggests that institutional constraints such as parliamentary control over government finances protect property rights and encourage investment by limiting the ability of rulers to expropriate. Consistent with arguments linking predatory or "strong" states with poor economic performance, current data indicate that there is a clear increasing relationship between ruler limits and income (Figure 1).

However, the literature's focus on executive predation discounts the positive economic roles that robust governments may play. Political scientists argue that traditional local elites in parts of sub-Saharan Africa oppose fiscal control by national governments, leading "weak" states to underinvest in public services that increase productivity. By contrast, the successful development experiences of Asian Tiger nations took place under powerful fiscal states.[2] Consistent with claims relating fiscal strength to better economic outcomes, current data indicate that there is a strong positive correlation between tax revenues and income (Figure 2).

Taken together, this descriptive evidence suggests that today's advanced economies strike a balance between weak and strong fiscal elements. Rich states typically possess a set of political institutions that link powerful centralized tax structures with parliaments that limit executive control over public finances. They are thus able to gather large tax revenues and can channel funds toward public services with positive economic benefits.[3]

Yet many of today's advanced economies were not "born" with efficient fiscal and political institutions. Dincecco (2011) argues that sovereign governments in Old Regime Europe typically faced two fundamental political problems: fiscal fragmentation and absolutism. Though rulers exercised weak authority over taxation, they wielded strong control over spending. Under this equilibrium, executives were starved for revenues and spent funds on foreign military adventures rather than on non-military public services with broad economic benefits like transportation infrastruc-

[1]For theory, see North and Thomas (1973), Brennan and Buchanan (1980), North (1981), Levi (1988), McGuire and Olson (1996), and North et al. (2009). For empirics, see De Long and Shleifer (1993), Knack and Keefer (1995), and Acemoglu et al. (2001, 2002, 2005a).

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

[3]Acemoglu (2005) refers to this type of outcome as a "consensually strong state."

ture. To improve fiscal outcomes, states had to gain force by implementing uniform tax systems at the national level. They also had to restrict power by establishing parliaments that could monitor government expenditures at regular intervals. Dincecco claims that the emergence of modern systems of public finance was the result of the resolution of these two key political problems.

Taking our cue from Dincecco's work, this paper argues that economic performance is likely to improve in states where governments are able to solve problems of weak fiscal authority and strong executive spending control. To make our case, we also study Europe, the birthplace of modern economic growth. Since governments around the world have implemented European forms of fiscal governance (La Porta et al., 1998, Nunn, 2009), a proper understanding of the European experience translates into useful lessons for today's emerging countries.

We claim that, by enabling governments to gather large tax revenues and channel those funds towards valued non-military public services, states with "balanced" fiscal systems stimulate economic performance. It is striking that the establishment of modern fiscal systems typically preceded economic takeoff in Europe's past. England possessed a fiscally centralized and politically limited regime before industrialization during the middle of the eighteenth century. Likewise, most countries in continental Europe implemented modern fiscal systems before industrialization during the second half of the nineteenth century. We interpret this timing as prima facie evidence that is consistent with our argument about the link between balanced fiscal states and economic performance.

To rigorously develop our claim, we perform a dynamic simultaneous equation panel analysis on a novel database that spans eleven countries and four centuries. By accounting for the potential endogeneity of the political, fiscal, and economic variables and for autocorrelation in fiscal and economic outcomes, this approach avoids simultaneous equation biases and yields consistent and efficient estimates. We divide our econometric analysis into two parts. The first tests the linkages between political regimes, tax revenues, and economic performance from 1650 to 1913. The second incorporates the available nineteenth-century disaggregated expenditure data and tests the linkages between regimes, revenues, non-military spending, and performance from 1816 to 1913. The results indicate that the impact of balanced fiscal systems on economic performance was large, statistically significant, and robust to the specification. On average, the establishment of a fiscally centralized and politically limited regime increased per capita GDP by at least 10 percent over a half-century, and by at least 14 percent over a full century. If France had always had a centralized and limited regime, for instance, then per capita GDP would have risen by 17 percent by the eve of World War I, enabling its otherwise middling economy to surpass several key competitors and become one of Europe's richest.

Our paper is related to the literature that links the rise of representative government and the provision of non-military public services. Military expenditures absorbed 70 to 90 percent of sovereign tax revenues in pre-nineteenth-century Europe (Hoffman and Rosenthal, 1997). After 1815, states began to follow growth-oriented policies including infrastructure investments like railways or canals. Rosenthal and Wong (2011, ch. 6) attribute public service improvements to the mechanism of "voice" through parliament, and Lindert (2004) focuses on representative government to explain the rise of the welfare state and mass schooling at the end of the nineteenth century. Voice is also at the core of North et al.'s (2009) argument regarding the historical transition from closed access orders that favored wealthy elites to open access orders that promote political and economic competition.[4] Our study complements these works by rigorously examining the impacts of parliamentary government and centralizing fiscal reforms, which allowed states to collect greater tax revenues and thus play larger economic roles.

In this respect, our paper is also related to the literature that claims that the state was an active participant in the development of modern capitalist systems beyond the establishment of the institutional "rules of the game" (North, 1981).[5] Gerschenkron (1966) argues that government intervention was necessary for late-moving economies in nineteenth-century Europe like Austria, Denmark, or Germany that had to play industrial catch-up. Furthermore, Magnusson (2009) claims that the state also played an important role in the economic takeoff of first-mover countries like Britain. Our study provides a rigorous counterpart to these works.

Our paper thus contributes to the debate regarding the institutional origins of the Industrial Revolution. Mokyr (2008) argues that these origins are not well understood. North and Weingast (1989) and Acemoglu et al. (2005b) highlight formal insti-

[4]Przeworski et al. (2000, ch. 3) find that democracy has no significant impact on income growth for a global sample in the post-World War II era. However, we may think that the consumption-investment trade-off that these scholars highlight was less severe for elite nineteenth-century European democracies.

[5]Recently, Karaman and Pamuk (2011) also suggest that national security gains played a key role in the European growth process.

tutions like parliament that generated efficiency gains by protecting property rights and reducing transaction costs. By contrast, Mokyr (2008, 2010) emphasizes informal, private-order institutions like cultural beliefs that engendered trust among inventors and entrepreneurs and promoted technological breakthroughs.[6] Our study complements this literature by investigating the economic effects of improved fiscal and political capacity across many states and centuries.[7]

Finally, our paper is related to the literature that examines the links between historical institutional factors and current economic performance, including Diamond (1997), Engerman and Sokoloff (1997), La Porta et al. (1998), Hall and Jones (1999), Acemoglu et al. (2001, 2002, 2005a), and Nunn (2008, 2009). None of these studies, however, explicitly focus on fiscal capacity. In this respect, our study is related to the set of works by Besley and Persson (2008, 2009, 2010, 2011) which investigates the long-run relationships between warfare, investments in fiscal and legal capacity, and growth.[8] Yet there are still few empirical investigations about the long-term links between fiscal and political capacity and performance. Our study adds to this burgeoning literature.[9]

The rest of the paper proceeds as follows. Section 2 describes the historical background, and Section 3 develops our theoretical implications. Section 4 presents the data, Section 5 the descriptive statistics, and Section 6 a case study of France. Section 7 describes the econometric methodology. Section 8 presents the sets of econometric results for the 1650-1913 and 1816-1913 panels. Section 9 concludes with lessons from history.

[6] Similarly, Clark (2007) highlights cultural values like patience, hard work, and ingenuity, but downplays the direct effect of formal institutions.

[7] The literature on the Industrial Revolution is enormous. Other recent works include Allen (2009), who highlights the unique alignment of interest rates, energy prices, wages, and land rents in eighteenth-century Britain, van Zanden (2009) and Voigtländer and Voth (2010), who stress its medieval origins, and O'Brien (2011) and Rosenthal and Wong (2011), who emphasize the impact of warfare.

[8] These works are largely theoretical. Also see Acemoglu (2005) and Acemoglu et al. (2010, 2011a). This literature is related to the literature on warfare and state formation in Western Europe, including Brewer (1989), Tilly (1990), Hoffman and Rosenthal (1997, 2000), and O'Brien (2001, 2005, 2011).

[9] Exceptions include Besley and Persson (2009, 2011), Dincecco et al. (2011), and Dincecco and Prado (2011). Scheve and Stasavage (2010) test for the long-run effects of mass warfare on tax reforms.

2 Historical Background

This section characterizes the two fundamental political transformations that resolved weak- and strong-state fiscal problems in European history. We argue that states gained tax force through fiscal centralization and restricted executive power through limited government.[10]

Fiscal Centralization

Most polities in Europe were fiscally fragmented before the nineteenth century. Contrary to the conventional wisdom, monarchs confronted a host of incumbent local institutions that reduced their fiscal powers. In the words of Epstein (2000, p. 13): "[D]ecades of research on pre-modern political practices ... has shown how 'absolutism' was a largely propagandistic device devoid of much practical substance."[11]

One general feature of fragmented states was the close relationship between local tax control and political autonomy. Provincial elites had strong incentives to oppose fiscal reforms that threatened traditional tax rights. The result was a classic public goods problem. Since each local authority attempted to free-ride on the tax contributions of others, the revenues that national governments could gather per capita were low.

To resolve the problem of local tax free-riding, executives had to gain the fiscal authority to impose standard tax menus rather than bargain place by place over individual rates. So long as states equalized rates across provinces at relatively high levels, government revenues per head rose. Hoffman and Rosenthal (2000) argue that both executives and local elites may have preferred centralized fiscal regimes as part of power-sharing agreements in which the executive received larger funds and elites, which coordinated efforts through representative bodies, could finance a larger portion of the non-military public services that they desired. We further discuss this possibility ahead.

A clear and simple definition of fiscal centralization facilitates comparison across states. The centralization process was completed the year that the national government first secured its revenues through a standard tax system with uniform rates

[10] Our account follows Dincecco (2011, chs. 2, 3), who also provides sources.

[11] Also see Henshall (1992), Hoffman and Norberg (1994), Hoffman and Rosenthal (1997), Rosenthal (1998), O'Brien (2001), Magnusson (2009), Dincecco (2009, 2011), and Rosenthal and Wong (2011).

throughout the country. All pre-centralized regimes were classified as entirely fragmented, even for states where fiscal divisions were relatively small. This choice implies that some regimes counted as fully fragmented will encompass data associated with higher per capita revenues. Average improvements after fiscal centralization will therefore be smaller than otherwise. Systematic underestimation of the fiscal effects of centralization biases the data against the hypothesis that fiscal centralization increased revenues. The results of the econometric analysis will thus be stronger than otherwise if it still indicates that fiscally centralized regimes had significant positive fiscal effects.

Table 1 displays the dates of fiscal centralization. England had centralized institutions very early. The Norman Conquest of 1066 established a uniformity of laws and customs that other states did not achieve until much later.[12] In many parts of continental Europe, structural changes took place swiftly and permanently after the fall of the Old Regime. The National Assembly transformed the tax system in France by eliminating traditional privileges with the start of the Revolution (1789-99). Napoleon completed this process upon taking power in 1799. The First French Republic conquered the Low Countries in 1795, and the Southern Netherlands including Belgium became French departments. The Batavian Republic, the successor to the Dutch Republic, established a national system of taxation under French rule in 1806. Although French conquest at the start of the 1800s was also the major catalyst for fiscal change on the Italian peninsula, the unification of tax systems among preunitary Italian states did not occur until after the establishment of the Kingdom of Italy in 1861. Finally, Prussia undertook major administrative reforms including fiscal centralization after its loss to France in the Battle of Jena-Auerstedt in 1806.

Although Napoleon defeated Austria in 1805 and invaded Portugal in 1807 and Spain in 1808, he failed to implement lasting administrative changes in those territories. Fiscal centralization did not take place in the Austrian Empire until after the Revolutions of 1848, which had important implications for bureaucratic structures. Most notably, the central government in Vienna began to implement an effective Cisleithanian tax system in Hungary.[13] Fiscal centralization also occurred in the 1840s in Spain

[12] England conjoined with Wales in 1536. The Act of Union of 1707 conjoined Scotland. A similar Act conjoined Ireland in 1800 (the Irish Free State was established in 1922). For consistency, the term "England" rather than "Great Britain" or the "United Kingdom" is used throughout the text.

[13] Austria and Hungary were the largest territories of the Austrian Empire (1804-67). The Compromise of 1867 led to the establishment of the Austro-Hungarian Empire (1867-1918). For consistency, the term "Austria" is used throughout the text.

during a period of major reforms. Significant changes in public finances in Portugal took place in the 1850s after the end of a long revolutionary era. The 1859 reform led to the centralization and regulation of government accounts.

Pre-modern fiscal structures remained in Scandinavia through much of the 1800s. Major changes did not occur until the second half of the nineteenth century or later. The 1861 reform in Sweden abolished the traditional system of dividing tax subjects into different classes with many sub-groups and rules for fixed contributions. Similarly, the 1903 reform in Denmark eliminated traditional tax structures and introduced a modern income tax with standard, country-wide rates.

Limited Government

By eliminating local tax free-riding, fiscal centralization increased the ability of national governments to collect greater revenues. Since rulers retained control over expenditures, however, the consolidation of fiscal powers may have exacerbated problems of executive discretion.

Although rulers spent government funds as they pleased, elites in parliament exercised tax authority.[14] Since elites feared that executives would spend additional revenues in wasteful ways like foreign military adventures, they demanded the power of budgetary oversight before raising new taxes. In the words of Hoffman (2009, p. 24), monarchs "overspent on the military and provided more defense than their citizens likely desired. But they had little reason not to. Victory ... won them glory, enhanced reputations, and resources ... Losses never cost them their throne." To evade parliament, rulers resorted to fiscal predation, which reinforced the fear that they could not be trusted. Elites in parliament thus resisted tax requests and revenues were low.

Regular control over state budgets firmly established the fiscal supremacy of parliament. In turn, the likelihood of poor spending choices by executives fell. Just as rulers and elites each had reasons to favor fiscal centralization, they both had incentives to set new rules over government expenditures. Structural reforms implied that rulers would receive greater revenues. However, the surrender of budgetary control was the only credible way for executives to guarantee that a portion of the new funds would be used on non-military public services that elites in parliament desired. So long as rulers and elites struck deals, regimes with low taxing and spending were less

[14] Hoffman and Rosenthal (1997, 2000) refer to this type of outcome as "divided fiscal authority."

attractive.

Hoffman and Rosenthal (2000) argue that limited government emerged after 1800 due to an important change in the nature of warfare. For the first time, kings who were defeated on the battlefield also faced the risk of losing their thrones. The advantages of greater tax revenues to wage successful wars began to outweigh the benefits of absolute control over spending. Furthermore, Acemoglu and Robinson (2000) claim that rulers gained from expenditures on non-military public services that prevented social unrest.

Hoffman and Rosenthal examine the broad historical shift from absolutist to parliamentary regimes, suggesting that fiscal centralization and limited government took place simultaneously. Although it is true that each political transformation complemented the other, they did not typically occur in one fell swoop. Structural changes in tax systems, which were in several cases imposed "exogenously" by French revolutionary or Napoleonic armies, generally took place decades before the establishment of stable national parliaments. Our analysis thus distinguishes between the fiscal and economic effects of fiscal centralization and those of limited government.

A valid depiction of parliamentary authority must capture its real power over the budget. It must also be clear and simple enough to apply across states. The substance of our definition derives from the spirit of constitutional reform as expressed in the classic work of North and Weingast (1989). Limited government was established the year that parliament gained the stable constitutional right to control the national budget on an annual basis. The requirement that parliament's power of the purse held for at least two consecutive decades ensures stability. To make the coding as objective as possible, years and regimes for which there are widespread academic consensus were chosen.

Selecting early dates to define political regimes as limited implies that average outcomes under parliamentary regimes will be worse than otherwise. Since public finances in Europe typically improved over time, the choice of early dates means that some regimes classified as limited will encompass data associated with lower non-military spending per capita. Average improvements after parliamentary reforms will therefore be smaller than otherwise. Systematic underestimation of the fiscal impacts of limited government biases the data against the hypothesis that parliamentary reforms increased non-military spending. Any results of the econometric analysis that still indicate that limited government had significant positive effects on spending habits will thus be stronger than otherwise. There were also some instances of switching back and forth between absolutism and limited government over the 1800s. As described, our definition sets a stability threshold by requiring that parliamentary budgetary authority held for at least two straight decades.

Nineteenth-century France illustrates the coding methodology. The Bourbon monarchy was restored after the final defeat of Napoleon in 1815. This regime was constitutional, though in name only. In 1830, King Charles X dissolved parliament, manipulated the electorate in favor of his supporters, placed the press under government control, and called for new elections. These measures incited the July Revolution the next day. King Louis Philip, the replacement for the deposed monarch, agreed to follow constitutional principles, but his tenure was beset by the economic crisis of the mid-1840s and ended with the Revolution of 1848. Since the reign of Louis Philip endured for less than two decades, our benchmark scheme does not code the July regime as limited. However, the case study in Section 6 explicitly accounts for its fiscal effects. Napoleon III, who was elected president of the Second Republic in 1848, staged a successful coup in 1851 and established an authoritarian regime (called the Second Empire) that lasted nearly 20 years. The emperor was captured during the Franco-Prussian War (18701), and the provisional government of the Third Republic was quickly formed. This regime was consolidated in the aftermath of the conflict, which France lost, and endured for 70 years until the German invasion of 1940. Since the Third Republic best satisfies the triple criteria of parliamentary regularity, stability, and scholarly consensus, our coding methodology dated the emergence of limited government in France to 1870.

Table 1 displays the dates of limited government. Parliamentary reforms typically occurred decades after fiscal centralization. Belgium was established as a constitutional monarchy after declaring independence from the Netherlands in 1830. In Prussia, King Frederick William IV granted a liberal constitution after the political revolutions of 1848.[15] In Italy, the constitution first endorsed by King Charles Albert of Piedmont during the political revolutions of 1848 was extended to the entire kingdom in 1861. In Austria, the Compromise of 1867, which established Austria and Hungary as distinct political entities, marked the start of the constitutional era. Spain fought several civil wars over the 1800s. After decades of failed attempts, a stable

[15]Tilly (1966) argues that there were binding fiscal constraints from 1848 onward, although the government operated without legislative approval of its military budgets during the 1860s. Also see Ziblatt (2006, pp. 113-16).

parliamentary regime was established in 1876.

By contrast, limited government and fiscal centralization took place within a decade of each other in Sweden and Portugal. Although Sweden enacted a constitution in 1809, the executive retained absolute veto authority, and parliament met only once every five years. The parliamentary reform of 1866, which replaced the traditional Diet of Estates with a modern bicameral legislature, established limited government. This institutional change occurred five years after fiscal centralization in 1861. Like Spain, Portugal fought a series of civil wars over the nineteenth century. A stable constitutional regime was established in 1851, eight years before fiscal centralization in 1859.

There are two cases in which limited government was implemented well in advance of fiscal centralization. In Denmark, King Frederick VII renounced his absolutist powers and established a two-chamber parliament after the political revolutions of 1848. Fiscal centralization did not take place in Denmark until 1903.[16] Although the Dutch Republic (1572-1795) was not limited in the sense of a parliament that monitored executive spending, Tilly (1990), De Long and Shleifer (1993), Acemoglu et al. (2005a), and Stasavage (2005) code it as constitutional. Recall, however, that the Republic was fiscally fragmented at the national level.

Reverse Causation?

Before discussing the theoretical implications, it is useful to consider the possibility of reverse causation from fiscal or economic outcomes back to political transformations. For instance, did low per capita revenues affect government decisions to implement centralized tax institutions or limited government?

The historical evidence strongly suggests that political transformations were largely exogenous to public finances and economic outcomes. As described, the establishment of uniform tax systems was often the result of radical, externally imposed reform. In the German territories, in the Low Countries, and on the Italian (and to a lesser extent, the Iberian) peninsula, fiscal centralization was the result of French conquest from 1792 onward. Indeed, Acemoglu et al. (2011b) study this case as a quasi-natural experiment to test for the long-term economic effects of the French Revolution.

[16] However, the constitutional revision of 1866 restricted the suffrage in ways that favored the conservative and the wealthy.

Elsewhere, fiscal centralization often took place in the midst of large-scale administrative reforms that established new state bureaucracies. Major institutional changes typically occurred during times of economic, political, and social upheaval. The establishment of a uniform tax system in France itself during the Revolution (1789-99) illustrates the conflux of these factors, as does the case of Prussia during the Napoleonic Wars (1803-15), Austria during the Year of Revolutions (1848), and Portugal and Spain near times of civil wars.

A similar claim can be made for the establishment of limited government. Acemoglu et al. (2009) find that economic development does not cause transitions to democracy. Rather, important historical junctures, such as the French Revolution or the Revolutions of 1848, set countries on divergent politico-economic paths.

This point relates to the exact timing of institutional change. There is little evidence that supports the claim that states undertook political transformations in direct response to economic or fiscal conditions. Rather, these reforms were the result of exogenous shocks or the confluence of idiosyncratic economic, geographical, political, and social factors. Even if political reforms did occur due to public finances or the economy, however, the precise date of institutional change was unpredictable and subject to chance.

The Glorious Revolution of 1688 in England illustrates this argument. Upon the death of Charles II in 1685, James II became king. Protestant elites were greatly troubled by the fact that James II was a devout Catholic with strong ties to France. The year 1688 was also the start of the War of the Grand Alliance, fought between France and a European-wide coalition including William III of Orange (who was crowned King of England alongside Queen Mary in 1689 after James II was deposed). One can argue that the coming together of particular events at a certain point in time - or, in a nutshell, chance - brought about limited government in England in 1688 but not before. Several previous attempts at institutional change failed, including the 1685 rebellion led by the Duke of Monmouth. By this logic, one can also make the case that constitutional reform in England could have occurred on any number of occasions from 1640 to 1700, or not at all. Indeed, Pincus (2009) claims that the Glorious Revolution was contingent and not pre-ordained. Similar arguments apply to France in 1789, the Year of Revolutions in 1848, and other critical junctures.

Highlighting the key role that chance plays in the exact timing of institutional change strengthens the argument that political transformations were largely exogenous to public finances and economic outcomes. Furthermore, our econometric strategy as described in Section 7 controls for several factors that may simultaneously affect fiscal, political, and economic outcomes, and can accommodate feedback effects from economic and fiscal developments to subsequent political reforms.

3 Theoretical Implications

We argue that fiscally centralized and politically limited regimes enabled states to raise large tax funds and then productively use them. Fiscal centralization increased the amount of revenues that governments collected per head by eliminating local tax free-riding. Since executives could make credible commitments to spend new funds on non-military public services rather than on ill-advised wars, limited government made parliaments more willing to submit to greater tax burdens. Hence, it also increased revenues per capita.[17]

Although higher tax revenues per head made it easier for executives to provide public services under fiscally centralized regimes, the consolidation of fiscal powers may have had an adverse impact on public finances through greater wasted spending. It is thus unclear whether expenditures on non-military public services actually rose under centralized versus fragmented regimes. However, by regularly monitoring the government's budget, and thereby reducing the likelihood of bad spending choices by executives, parliamentary power of the purse should have increased non-military expenditures.

It is important to emphasize that we present the theoretical implications in ceteris paribus terms. Schultz and Weingast (1998) claim that, in the context of the long-term international rivalry that characterized pre-modern Europe, the ability of limited regimes to make credible spending commitments was a critical military advantage over absolutist ones. For instance, average total expenditures for parliamentary England in the war-intensive century following the Glorious Revolution of 1688 were 9.23 gold grams per capita, more than double the average for absolutist France (Dincecco, 2011). We may think that parliamentary power of the purse gave citizens confidence that military decisions and investments were relatively sound.[18] Once

[17] Dincecco (2009, 2011) shows that both political transformations led to significant revenue growth.

[18] We may also think that, given England's unique status as the first industrialized nation, state economic intervention was of less overall importance (Gerschenkron, 1966). However, Magnusson (2009, ch. 4) argues that the British government played a notable industrial role.

military supremacy - and thus international peace - was truly established (i.e., the Pax Brittanica after 1815), then our previous theoretical implication should hold firm, as parliamentary fiscal power facilitated the switch toward the provision of non-military public services. Indeed, average per capita non-military spending for England during the Pax Brittanica was 12.29 gold grams per head, roughly three times its average for the war-intensive eighteenth century (Mitchell, 1988). We examine these points further in the case study of France in Section 6.

Figure 3 summarizes the basic linkages between political regimes, fiscal characteristics, and performance outcomes. Regime type affected both the state's ability to collect tax revenues per capita and the way that it then spent them, which in turn influenced performance. For instance, investments in non-military public services like transportation infrastructure (e.g., railways) should have reduced trade costs and increased income.[19]

Complementing this figure, Table 2 describes the fiscal and economic features of different political regimes. Under fragmented and absolutist regimes, tax revenues per head should have been low and any available funds should have been unproductively used on foreign military adventures. Economic performance should have been poor as a result. Under centralized and limited regimes, by contrast, per capita revenues should have been high and funds should have been productively used on non-military public services. By solving both political problems, performance should have been relatively better. Under fragmented and limited regimes, any available funds should have been productively used, but revenues per head should have been low. Hence, performance should have been higher than under fragmented and absolutist regimes but lower than under centralized and limited ones. Finally, under centralized and absolutist regimes, per capita revenues should have been high, but funds would not necessarily have been productively used. Here our prediction is less clear. Although performance under centralized and absolutist regimes should have been lower than under centralized and limited ones, depending on ruler spending decisions it could have been higher or lower than under fragmented and absolutist regimes or fragmented and limited ones.

Overall, our theoretical implications indicate that we should observe significant impacts of political transformations on fiscal and economic outcomes. However, there

[19] For theory, see Eaton and Kortum (2002). The cross-country study by Bogart (2008) finds that state railroad construction promoted development during the late nineteenth century. Also see O'Brien (1983) and Cardoso and Lains (2010).

are at least three reasons why our econometric results should be interpreted as lower-bound estimates. First, Section 2 shows how the ways in which we define fiscal centralization and limited government generate a strong downward bias to the magnitudes of our fiscal estimates.

Furthermore, our focus on a single, specific channel through which political and fiscal improvements affected economic performance - namely, the impacts of greater revenues and non-military expenditures - creates a strong downward bias to our economic estimates. Though overall taxes were low in fragmented and absolutist regimes, the problem of divided fiscal authority implied that they could still be very harmful at the margin (Hoffman and Rosenthal, 1997). Since rates were typically high in sectors over which rulers traditionally presided and taxes were politically feasible, resources would be diverted into those sectors that were tax exempt. To prevent the erosion of the tax base, rulers had to enact rigid, inefficient laws that decreased investment mobility. Similarly, divided political authority over rights of eminent domain typically held up infrastructure projects that were otherwise profitable (e.g., Rosenthal, 1992). Since many groups could block new projects, transaction costs were high, reducing the number and scope of growth-enhancing investments. The virtue of our approach, which funnels the performance effects of political regimes through a specific fiscal mechanism, is the ability to pinpoint a precise set of causal linkages. However, the cost is that we must overlook other key ways in which fragmented and absolutist regimes distorted incentives and impeded performance, strongly reducing the magnitudes of our economic estimates.

Interstate political competition generates even further downward bias. Over the nineteenth century, states came to view industrial strength as an important basis for military prowess (Magnusson, 2009, Rosenthal and Wong, 2011). Major public investments like railway infrastructure served military as well as economic purposes, and were thought to have important consequences for the European balance of power. Even authoritarian rulers had strong incentives to invest in non-military public services (Rosenthal and Wong, 2011, ch. 6). Furthermore, the onset of industrialization gave rise to new sources of social unrest, increasing the basic amount of non-military public services that authoritarians (e.g., Napoleon III) had to provide to sustain power (Acemoglu and Robinson, 2000). These two factors imply that actual differences in non-military spending between absolutist and limited regimes were smaller than our theoretical prediction would indicate, reducing our economic estimates to an even greater extent. Combined, these three reasons - the strictness of the regime definitions, the focus on a single causal channel, and the role of political competition - mean that the magnitudes of our econometric results should be considered lower-bound estimates of the fiscal and economic effects of political transformations.

4 Data

The data on government revenues from 1650 to 1913 are from Dincecco (2011). Systematic data for non-military expenditures are not available before the nineteenth century. These data, which we take from a variety of secondary sources, run from 1816 to 1913. The Appendix describes the sources and construction methods for the spending data.

For reasons of data availability, comparability, and reliability, we focus on taxing and spending by national governments, rather than general taxing and spending that included local and regional governments.[20] All of our sample countries (save Prussia after the establishment of the federal German Empire in 1871) had centralized political structures during the sample period. Furthermore, we may think that national governments were better able than local or regional ones to provide the types of non-military public services (e.g., major infrastructure projects like railways) that interest us here. Thus, the use of national government data should not bias our analysis.[21]

Bonney (1995, pp. 423-506) discusses the limitations of historical budgetary data. European states did not maintain detailed fiscal records during the seventeenth and eighteenth centuries. National governments may have calculated yearly budgets in a variety of ways. Some states computed budgets with revenues that they intended to raise, even if funds did not enter government coffers until years later. Insofar as possible, the revenues used here were tax receipts for national governments in a given year. Ordinary and extraordinary figures were summed, and loan incomes were subtracted. Since the different ways in which Old Regime governments tabulated yearly revenues suggest that they typically overestimated the amounts of resources available to them, average revenues under fragmented and absolutist regimes should have appeared larger than otherwise. Furthermore, government accounting practices typically im-

[20]There was also the possibility of the private provision of "public" services like infrastructure (e.g., Bogart, 2005).

[21]Persson and Tabellini (2003) find that there is a very strong correlation between the size of national and general governments in the post-World War II era.

proved over time, reducing the number and magnitude of misestimates. These features bias the data against the hypothesis that political transformations led to greater tax incomes.[22] By the nineteenth century, national governments had typically developed modern fiscal administrations, or were in the process of doing so. The 1816-1913 data on non-military expenditures should thus be reliable overall.

To make revenue and expenditure calculations comparable across countries, all currency units were transformed into gold grams. This conversion reduced inflation effects. The years between missing revenue observations were interpolated. Population figures were also interpolated between census years. Since there were few major one-off fiscal changes or population shocks (e.g., plague) from 1650 to 1913 besides the two political transformations that we focus on, the interpolated data should provide reasonable estimates. However, as the linkages between tax bases and government spending were weaker than those for revenues, particularly during wars, we did not interpolate the years between missing expenditure observations. Finally, the data were averaged over five-year periods to smooth short-run fluctuations and mitigate measurement errors (e.g., Beck and Levine, 2004).[23]

5 Descriptive Statistics

Table 3 summarizes the relationships between political regimes and economic performance from 1650 to 1913. Our main performance measure is GDP per capita in 1990 international Geary-Khamis dollars from Maddison (2010). Average per capita GDP levels for centralized and absolutist (1,446), fragmented and limited (2,043), and centralized and limited (2,176) regimes were high relative to those for fragmented and absolutist ones (1,016). The GDP estimates are relatively reliable for the 1816-1913 period, but less so before the nineteenth century. As an alternative performance measure for the 1650-1913 panel, we calculate urbanization rates as urban populations as fractions of total populations from De Vries (1984).[24] Urbanization trends across political

[22]If Old Regime governments made payments in kind to fund public services like infrastructure, then it is possible that no official record of these expenditures would exist. However, the economic impacts of these public services would still be had. This feature would bias the data against the hypothesis that political transformations had positive performance effects, because it would both ignore the government's economic role and reduce the difference in average performance between fragmented and absolutist regimes and other regime types.

[23]Our results remain similar if 10- or 25-year averages are used.

[24]Our findings also hold if we use urbanization rates as our performance measure for the 1816-1913 panel.

regimes resemble those for per capita GDP.

We argue that a key reason why economic outcomes were better under centralized and limited regimes was because those states were able to both raise large tax funds and productively use them. Table 4 summarizes the relationships between political regimes and revenues from 1650 to 1913. Average per capita revenues in gold grams for centralized and absolutist (7.05), fragmented and limited (10.49), and centralized and limited (12.97) regimes were high relative to those for fragmented and absolutist ones (2.42).

Similarly, Table 5 summarizes the relationships between political regimes and non-military spending from 1816 to 1913. Average per capita non-military expenditures in gold grams for centralized and absolutist (6.95), fragmented and limited (7.27), and centralized and limited (11.57) regimes were high relative to those for fragmented and absolutist ones (1.81). Transportation infrastructure, and in particular railway networks, was a key non-military expense for most nineteenth-century governments (O'Brien, 1983, Cardoso and Lains, 2010). Furthermore, railway data are widely available. As an alternative to non-military spending, we calculate the amount of railway kilometers built per square kilometer of domestic territory from Mitchell (2003). Railway construction trends across political regimes are similar to those for per capita infrastructure spending.

Finally, Table 6 summarizes the 1816-1913 spending data that is disaggregated beyond non-military expenditures. These data are only available for six sample countries. Central government spending on poor relief, unemployment compensation, health, and housing was low through 1913 (Lindert, 2004, ch. 2). We focus on expenditures on two non-military public services that nineteenth-century governments typically provided: infrastructure and education. Average per capita infrastructure and education spending for centralized and limited regimes (1.12 and 0.78 gold grams) was high relative to other regime types.[25]

6 Case Study of France

The overall trends in Tables 3 to 6 are consistent with our argument that political transformations improved economic performance through better public finances. These

[25]There were no data observations for the infrastructure or education variables for fragmented and absolutist regimes. This lack of data is perhaps not surprising given the typical backwardness of this regime type.

patterns also hold for individual countries. To further illustrate the linkages between political regimes and fiscal and economic outcomes, we now examine France.[26]

Figure 4 plots French national government revenues from 1650 to 1913. Revenues were low, averaging slightly more than 3 gold grams per capita, under the fragmented and absolutist regime that lasted through 1789. There was a sharp increase in French revenues, which roughly doubled to 10 gold grams per head, in the two decades after fiscal centralization in 1790. French revenues leveled out, but never fell back to pre-1789 levels, in the decades just after the Napoleonic era. In the 1840s, they began to increase once more, reaching more than 16 gold grams per capita by the end of the 1860s. The establishment of a stable centralized and limited regime took place in the aftermath of the Franco-Prussian War (1870-1). This set of events was associated with a sharp jump in revenues, which more than doubled to nearly 40 gold grams per head by 1913.

How about expenditures? Figure 5 plots spending on infrastructure and education by the French national government from 1816 to 1913.[27] Infrastructure and education expenditures under the centralized and absolutist regime were low, averaging less than 0.50 gold grams per capita, through the late 1820s. However, this spending nearly doubled to 0.81 gold grams per head under the short-lived centralized and limited July regime (1830-48). Napoleon III established authoritarian rule in 1851. During his reign, he fought five wars.[28] Though there was a small uptick in infrastructure and education spending at the start of the 1860s, it was relatively flat, averaging just 1 gold gram per capita. With the establishment of a stable centralized and limited regime in 1870-1, there was a rapid jump in infrastructure and education expenditures, which doubled to more than 2 gold grams per head by the start of the 1880s. Infrastructure and education spending continued to increase through 1913, reaching 3.54 gold grams per capita.

To complete this picture, Figure 6 plots the share of infrastructure and education expenditures in total expenditures for the French national government over the same period. This share doubled from 5 to 10 percent under the centralized and limited July regime from 1830 to 1848. Under the authoritarianism of Napoleon III, however, it fell, first to 6 percent during the late 1850s, and next to 4 percent with the Franco-

[26]Our account follows Dincecco (2011, chs. 3, 4, 5, and 8), who also provides sources.

[27]Due to data limitations, we focus this part of our case analysis on the nineteenth century.

[28]These were the Crimean War (1853-6), Franco-Austrian War (1859), Second Italian War of Independence (1859-61), Battle of Mentana (1867), and Franco-Prussian War (1870-1).

Prussian War and the downfall of his regime in 1870-1. Under the newly established centralized and limited regime, the share of infrastructure and education spending reversed course, reaching 9 percent by the start of the 1880s. This share continued to rise, though at a slower rate, through 1913.

Like the descriptive statistics, the case-study evidence for France supports our argument regarding the fiscal and economic benefits of political transformations. Both tax centralization and limited government were associated with greater revenues, and limited government with greater non-military expenditures. French average per capita GDP rose from 959 international dollars under the fragmented and absolutist regime to 1,357 under the centralized and absolutist one, and to 2,428 under the centralized and limited one (Table 3). However, neither the descriptive or case-study evidence fully characterizes the linkages between political regimes and fiscal and economic outcomes. The fiscal and economic variables may be endogenous or autocorrelated across time. Furthermore, country-specific unobservables may simultaneously influence political, fiscal, and economic outcomes. Historical features beyond political regimes (e.g., conflict) also affected performance. To provide a rigorous test of our argument, we now perform an econometric analysis that explicitly accounts for these factors.

7 Econometric Methodology

The structural form of our econometric model is based on the theoretical framework as summarized in Figure 3, where (1) political regime type affect the state's ability to collect tax revenues and (2) the way that it then spends them, which (3) in turn influences performance. We thus write the structural model as the following system of three equations:

$$\begin{aligned}\log(Revenue_{i,t}) = \alpha_0 + \alpha_1 \log(Revenue_{i,t-1}) + \alpha_2 CA_{i,t} + \alpha_3 FL_{i,t} + \alpha_4 CL_{i,t} + \\ \alpha_5 \log(GDP_{i,t}) + \alpha_6 \mathbf{X}_{i,t} + \alpha_7 \mathbf{\Lambda}_t + \mu_{i,1} + \epsilon_{i,t,1},\end{aligned} \tag{1}$$

$$\begin{aligned}\log(Expenditure_{i,t}) = \beta_0 + \beta_1 \log(Expenditure_{i,t-1}) + \beta_2 \log(Revenue_{i,t}) + \\ \beta_3 \mathbf{X}_{i,t} + \beta_4 \mathbf{\Lambda}_t + \mu_{i,2} + \epsilon_{i,t,2},\end{aligned} \tag{2}$$

$$
\begin{aligned}
\log(GDP_{i,t}) = \gamma_0 + \gamma_1 \log(GDP_{i,t-1}) + \gamma_2 \log(Expenditure_{i,t}) + \\
\gamma_3 \mathbf{X}_{i,t} + \gamma_4 \mathbf{\Lambda}_t + \mu_{i,3} + \epsilon_{i,t,3},
\end{aligned}
\tag{3}
$$

where $i = 1, \ldots, N$ denotes countries, $t = 1, \ldots, T_i$ denotes time, $CA_{i,t}$, $FL_{i,t}$ and $CL_{i,t}$ are political regime indicators, $\mathbf{X}_{i,t}$ and $\mathbf{\Lambda}_t$ are vectors of additional regressors, $\mu_{i,j}$, $j = 1, 2, 3$, are country-specific fixed effects that reflect the influence of time-invariant features (e.g., culture, geography, size), and $\epsilon_{i,t,j}$ capture transitory shocks and other omitted factors. The country effects are potentially correlated with all of the regressors in j, while the random disturbance terms are assumed to be uncorrelated over time and across countries.

The dependent variables for revenues, expenditures, and GDP are expressed in natural logarithms to attenuate the variability in per capita values. Logs also facilitate the interpretation of our results. The persistence of fiscal and economic processes is captured by the inclusion of lagged values of the dependent variables on the right-hand sides of the system's equations, with lag orders selected based on the Bayesian Information Criterion (BIC).[29]

The key independent variables are the political regime indicators $CA_{i,t}$, $FL_{i,t}$, and $CL_{i,t}$, which take the value 1 for each sample year that a country had a centralized and absolutist (fragmented and limited, centralized and limited) regime and 0 otherwise, with the fragmented and absolutist regime $FA_{i,t}$ as the benchmark. These dummies represent a clear, concise, and intuitive way to measure the fiscal impacts of political arrangements. Recall from Section 2 that our coding of political regimes biases the data against the hypothesis that political transformations improved public finances.

The vector $\mathbf{X}_{i,t}$ comprises a set of controls. Hoffman and Rosenthal (1997) argue that the one true goal of absolutist monarchs was to wage war for personal glory and for homeland defense. Military spending was by far the largest component of national budgets through the 1800s. To account the effects of warfare, we include a dummy variable for each year of external conflicts in Western or Eastern Europe according to Dincecco (2011, Table 7.1). We also control for the fiscal impact of internal conflicts, which disrupted tax and spending flows. To account for this factor, we include a dummy variable for each year of civil war, coup, or revolution, also from Dincecco (2011, Table 7.2). Bockstette et al. (2002) argue that historical differences in

[29]The consistency of the BIC model selection criterion holds irrespective of whether the underlying variables are stationary or integrated (Pesaran, 1997).

state capacity affect long-run growth potential. To control for state antiquity, we include their measure of initial state capacity in 1650 or 1816.[30] Alesina and Wacziarg (1998) claim that country size influences the scale and composition of government spending. To control for size, we include population data from Dincecco (2011, Appendix 1). Glaeser et al. (2004) argue that human capital rather than regime type is the root source of long-term growth. To account for human capital, we include literacy rate data from van Zanden (2009, Table 8) and Foreman-Peck (2011, Table 5).[31] The vector $\mathbf{\Lambda}_t$ captures cross-sectional dependence, including a set of observable factors common to all sample countries (Pesaran et al., 1999).

It is important to note that Equations 1 to 3 can only be estimated for the 1816-1913 period because, as described in Section 4, systematic data on non-military expenditures do not become available until the nineteenth century. We thus estimate a restricted system of two equations for the 1650-1913 panel:

$$\begin{aligned}\log(Revenue_{i,t}) = \alpha_0 + \alpha_1 \log(Revenue_{i,t-1}) + \alpha_2 CA_{i,t} + \alpha_3 FL_{i,t} + \alpha_4 CL_{i,t} + \\ \alpha_5 \log(GDP_{i,t}) + \alpha_6 \mathbf{X}_{i,t} + \mu_{i,1} + \epsilon_{i,t,1},\end{aligned} \tag{4}$$

$$\begin{aligned}\log(GDP_{i,t}) = \gamma_0 + \gamma_1 \log(GDP_{i,t-1}) + \gamma_2 \log(Revenue_{i,t}) + \gamma_3 \mathbf{X}_{i,t} + \\ \mu_{i,3} + \epsilon_{i,t,3}.\end{aligned} \tag{5}$$

Endogenous right-hand side regressors makes OLS estimates inconsistent (Baltagi, 2005). Furthermore, lagged values of the dependent variables among the regressors introduces another source of endogeneity due to their correlation with the state-specific effects $u_{i,j}$. GMM methods enable us to handle both problems, by differencing the equations to eliminate unobserved individual effects and then instrumenting for endogenous right-hand side regressors (Blundell and Bond, 1998). Unlike fixed-effect estimators, GMM methods can also account for the possible weak endogeneity of the right-hand side variables, because some regressors may be correlated with past errors and unobserved individual effects. This possibility is particularly important here, since economic and fiscal developments may affect subsequent political reforms.

Despite these advantages, GMM methods are not particularly well-suited for our investigation. Blundell and Bond (1998) show that GMM techniques are only appro-

[30] For our sample there are few within-country changes in this index over time.

[31] Since early literacy data are not available for Austria, Denmark, Portugal, we do not include this control in all specifications.

priate for settings with small T and large N. The efficiency gains from GMM methods become negligible as T increases, while the "many instruments" problem and computational difficulties associated with larger instrument sets become more acute (Judson and Owen, 1996, MaCurdy, 2007). Furthermore, lagged differenced values are typically poor instruments for time-persistent series like ours (Blundell and Bond, 1998).

Akashi and Kunitomo (2010) have recently proposed a "doubly-filtered" GMM estimator that is more robust than standard GMM techniques and avoids the exponential increase in the number of instruments as T grows. This method orthogonalizes the dependent and independent variables with respect to the fixed effects by using a "backward filter" that subtracts the average of the lagged values of each variable from its current value. The instruments are concomitantly "forward filtered," subtracting an average of the future values of each variable from its current value. The one-period-lagged, backward-filtered regressors are then used as instruments for the forward-filtered variables to account for simultaneity bias. The doubly-filtered estimator has been shown to outperform standard GMM estimators in large T, small N settings.[32]

Our econometric analysis is divided into two parts. The first tests the linkages between political regimes, tax revenues, and performance for the 1650-1913 panel. The second incorporates the available expenditure data and tests the linkages between regimes, revenues, non-military spending, and performance from 1816 to 1913. In both cases, we estimate our model using GMM and doubly-filtered GMM methods.

8 Estimation Results

1650-1913 Panel

Table 7 presents the results of our estimations for the 1650-1913 period in two panels. Panel A displays the estimates of the effects of public revenues on economic performance from Equation 5, and Panel B the estimates of the effects of political regimes on public revenues (Equation 4).

Column (1) reports the results for the standard GMM estimator. The estimates in Panel B indicate that political transformations had significant positive fiscal effects. The move from the fragmented and absolutist regime to the centralized and abso-

[32]For further details, see Akashi and Kunitomo (2010).

lutist one increased per capita revenues by 18 percent per five-year interval, and the move to the centralized and limited one by 21 percent. The effect of the move to the fragmented and limited regime is positive, but not significant. However, it becomes significant in the specifications shown in Columns (2) to (6). The estimates in Panel A indicate that public revenues (both contemporaneously and lagged) in turn had significant positive effects on GDP per capita. Though the five-year fiscal impact is small, performance effects accumulated over time. We illustrate the cumulative economic impacts of political transformations in the next subsection. The coefficient on the lag of per capita GDP in Panel A is positive and significant, indicating strong persistence over five-year intervals. GDP also had a positive concurrent effect on per capita revenues in Panel B.

How about the controls? Initial state capacity in 1650 had significant positive impacts on both public revenues and economic performance. This finding suggests that institutional features of states (e.g., administrative competence) beyond the channel that we propose played important fiscal and economic roles. Country size as measured by population also had significant positive effects on both dependent variables, though the significance of the impact on public revenues fell in some later specifications. Both external and internal conflicts had negligible effects on revenues and per capita GDP.

Column (2) repeats the specification in Column (1) for the doubly-filtered GMM estimator. The fiscal impacts of political transformations in Panel B increase. Furthermore, the impact of public revenues on economic performance in Panel A doubles.

Recall from Section 7 that data for literacy rates, our proxy for human capital, are only available for eight sample countries. Columns (3) and (4) include this control. The effects of political transformations on public revenues, and in turn public revenues on economic performance, remain similar in magnitude and significance to those shown in Columns (1) and (2). The impacts of political transformations on per capita revenues are even more pronounced than before. Human capital as measured by literacy rates had positive impacts on both public revenues and economic performance, though these effects are only significant for the doubly-filtered GMM estimator.

Columns (5) and (6) repeat the specifications in Columns (1) and (2) for our alternative performance measure, urbanization rates. Since urbanization rates persisted for notably longer periods than per capita GDP, these specifications use 25-year intervals. The results resemble those shown in previous columns. The estimates in Panel A indicate that public revenues in turn had significant positive impacts on urbanization. These results also hold if we include literacy rates (not shown). Unlike the specifications that use per capita GDP as our performance measure, we do not find a concurrent effect of urbanization rates on public revenues.

In sum, the results described in this section indicate that political transformations had significant positive impacts on economic performance through public revenue increases. These effects are strongly significant and robust across alternative specifications.

Data limitations prevent us from explicitly testing the links from revenues to non-military expenditures, and in turn from non-military expenditures to performance, in this setting. However, systematic non-military spending data are available over the nineteenth century, allowing us to gain a full picture of the linkages from political regimes to economic performance. The next subsection discusses these findings.

1816-1913 Panel

Table 8 presents the results of our estimations for the 1816-1913 period in three panels. To save space, we focus on the doubly-filtered GMM estimations. Panel A displays the estimates for Equation 3, which tests the effects of non-military expenditures on economic performance, Panel B the estimates of the effects of public revenues on non-military expenditures (Equation 2), and Panel C the effects of political regimes on public revenues (Equation 1).

Columns (1) and (2) report the results for the benchmark specification (including the control for literacy rates in the second column).[33] The impacts of political transformations on public finances and thus economic performance are all highly significant. The estimates in Panel C indicates that political transformations had significant positive effects on public revenues. Similarly, the results in Panel B indicates that public revenues in turn had significant positive impacts on non-military spending. A 1 percent increase in per capita revenues led to a 44 to 48 percent increase in per capita non-military expenditures per five-year interval. Lastly, the estimates in Panel A shows that non-military expenditures (both contemporaneously and lagged)

[33]Recall from Table 5 that there are few data observations for non-military expenditures for the fragmented and limited regime (10 in total, 8 for Denmark and 2 for Portugal). We thus exclude this regime from this part of our econometric analysis.

in turn had significant positive effects on economic performance. We illustrate the cumulative economic impacts ahead. The results for the controls and lagged dependent variables generally resemble those for the 1650-1913 panel. Now conflicts have significant positive effects on public revenues in Panel C, and significant negative effects on economic performance in Panel A.

Column (3) repeats the specification in Column (1) for railway kilometers per square kilometer, our alternative measure to non-military spending. The estimates in Panel B indicate that public revenues had significant positive impacts on infrastructure investments in the form of railways, and those in Panel A that railway investments in turn had significant positive effects on economic performance. A 1,000 kilometer increase in scaled railway kilometers led to a 10 percent increase in per capita GDP per five-year interval. These results are similar in magnitude and significance if we include literacy rates (not shown).

Columns (4) and (5) disaggregate the available non-military expenditure data into spending on infrastructure or education. Due to the small number of observations available, we restrict our attention to the analysis of the impact of state expenditures on economic performance.[34] The estimates reported in Panel A indicate that expenditures on infrastructure and education alike had a significant positive performance effects. A 1 percent increase in per capita infrastructure spending led to a 12 percent increase in per capita GDP per five-year interval, while a 1 percent increase in per capita education spending led to a 7 percent GDP increase.

The estimates obtained from the structural model indicate that political transformations had strong direct impacts on public revenues and non-military expenditures, and through this channel, strong indirect impacts on economic performance. To illustrate the marginal effects of political transformations on fiscal and economic outcomes, we now compute the dynamic and cumulative multipliers based on the reduced-form parameters derived from the specification in Column (1).[35]

Figure 7 plots the dynamic multipliers for the average fiscal impacts of political transformations at five-year intervals over a century-long period, holding all other

[34]Recall from Section 5 that there were no data observations for the infrastructure or education variables for fragmented and absolutist regimes.

[35]Starting from the structural representation of the model, $\Gamma Y_t + \Lambda Y_{t-1} + \Phi Z_t +_t = U_t$, the reduced form is given by $Y_t = \Pi Y_{t-1} + \Theta Z_t + V_t$, with $\Pi = -\Gamma^{-1}\Lambda$, $\Theta = -\Gamma^{-1}\Phi$, and $V_t = \Gamma^{-1}U_t$. The impact on Y of changes in the exogenous variables Z can then be quantified through a multiplier analysis based on the reduced-form parameters Π and Θ. For details, see Greene (2003). Note that this exercise is for illustrative purposes and does not account for feedback effects from economic and fiscal outcomes to political reforms.

exogenous variables constant. While the revenue effects (left panel) peaked immediately, non-military spending effects (right panel) peaked after 10 years. The peak impact of the move from the fragmented and absolutist regime to the centralized and absolutist one increased per capita revenues by 27 percent, and the move to the centralized and limited regime by 35 percent. Similarly, the peak impact of the move from the fragmented and absolutist regime to the centralized and absolutist one increased per capita non-military spending by 13 percent, and the move to the centralized and limited regime by 17 percent.

Though the direct effects of political transformations on public finances ultimately eroded, the positive indirect impacts on economic performance endured. Figure 8, which plots the average cumulative economic impacts of political transformations, indicates that performance effects accrued with time. Over a half-century, the move from the fragmented and absolutist regime to the centralized and limited regime increased per capita GDP by 10 percent, due to a per capita revenue increase of 190 percent and a subsequent non-military expenditure increase of 129 percent. Over a full century, the move to the centralized and limited regime increased per capita GDP by 14 percent. Similarly, the move to the centralized and absolutist one increased per capita GDP by 8 percent over a half-century and by 11 percent over a full century. Figure 9 indicates that the dynamic and cumulative trends also hold for the 1650-1913 panel.

To further illustrate the performance effects of political transformations, we perform a counterfactual exercise that compares average actual per capita GDP in 1913 against two alternative scenarios: per capita GDP in 1913 if the average sample country had had a centralized and limited regime from 1650 onward, or if it had always remained a fragmented and absolutist regime. If the average country had been centralized and limited from 1650, then per capita GDP in 1913 would have been 3,875 international dollars rather than 3,333, a 16 percent increase. If the average country had had a fragmented and absolutist regime over the entire period, however, then per capita GDP in 1913 would have been 2,876 international dollars, a 14 percent decrease. The former result indicates that if for instance France had always had a centralized and limited regime, then per capita GDP would have been 17 percent higher by the eve of World War I. Political improvements would have thus enabled it to surpass key competitors like Prussia, Denmark, and the Netherlands, establishing France as one of Europe's richest economies alongside Belgium and England. Finally, recall from Section 3 that, due to the strictness of our regime definitions, our focus on a single causal channel, and the role of interstate political competition, the magnitudes of these results should be interpreted as lower-bound estimates of the fiscal and economic effects of political transformations.

Overall, these results provide further evidence that political transformations had significant positive impacts on economic performance through public finance improvements. By explicitly testing the linkages from government revenues to non-military expenditures, and in turn from non-military expenditures to performance, the findings for the 1816-1913 period complement those for the 1650-1913 one.

9 Conclusion

Today's advanced economies strike a balance between weak and strong fiscal elements. Rich states typically possess a set of political institutions that link powerful centralized tax structures with parliaments that limit executive control over public finances. However, many of today's advanced economies were not "born" with efficient fiscal and political institutions. In this paper, we argued that economic performance is likely to improve in states where governments are able to solve both problems of weak fiscal authority and strong executive spending control. States with "balanced" fiscal systems stimulate economic performance by enabling governments to gather large tax revenues and channel those funds towards valued non-military public services.

To make our case, we examined the history of political transformations in Europe, where modern economic growth began two centuries ago. Most Old Regime states were fiscally fragmented, or "weak," in 1650, our starting year. Local tax free-riding reduced the ability of national governments to collect revenues. Fiscal centralization, which generally took place after the fall of the Old Regime at the end of the eighteenth century, was the first fundamental political transformation that states underwent. However, the consolidation of fiscal powers may have exacerbated problems of executive control. Since "strong" rulers could still use government funds as they pleased, spending constraints were necessary. The establishment of parliamentary limits, which typically occurred during the nineteenth century, was the second fundamental political transformation that states experienced. By the eve of World War I in 1913, European states could gather large tax revenues, and rulers faced parliamentary spending constraints. The end result was a set of balanced fiscal and political institutions of the sort that characterizes modern systems of public finance in today's wealthy countries.

To rigorously develop our argument, we performed a dynamic simultaneous equation panel analysis on a novel database that spanned eleven countries and four centuries. This approach avoids simultaneous equation biases and yields consistent and efficient estimates by accounting for both the potential endogeneity of the political, fiscal, and economic variables and for autocorrelation in fiscal and economic outcomes. We first tested the linkages between political regimes, tax revenues, and economic performance for the 1650-1913 period. We then incorporated the available nineteenth-century expenditure data and tested the linkages between regimes, revenues, non-military spending, and performance for the 1816-1913 period. The results of our econometric analysis indicate that the impact of balanced fiscal systems on economic performance was significant, large, and robust.

Taken as a whole, our findings suggest that fiscally centralized and politically limited regimes form part of a basic set of politico-economic institutions that underlie economic success. To conclude our study, we briefly examine three modern cases that roughly correspond with the main regime characteristics present in European history: executive "absolutism" in North Korea, fiscal "fragmentation" in Guatemala, and tax centralization and democratic government in South Korea.[36] Take first the authoritarian regime of Kim Jong-Il in North Korea, which spends very large sums on the military. Defense expenditures constitute up to 25 percent of North Korean GDP, and there are well over 1 million active duty military personnel. By contrast, defense spending in South Korea is less than 3 percent of GDP, and there are fewer than 700,000 active duty military personnel. It is thus possible that parliamentary control over the budgetary process in North Korea would improve the allocation of tax resources toward public services that would most benefit society.

Parliamentary power of the purse, though, is not always sufficient to ensure economic success. Unlike North Korea, Guatemala is a constitutional democratic republic. However, conservative oligarchs oppose structural reforms to the tax system. Between 2001 and 2003, the Supreme Court received more than 50 appeals from conservative interest groups to clarify, eliminate, or reduce taxes. Tax revenues, which rely heavily on indirect taxes, sum to less than 10 percent of GDP. By contrast, tax

[36]Our account follows Dincecco (2011, ch. 8), who also provides sources.

shares in rich countries are typically more than 20 percent of GDP, and in many cases more than 30 percent (Figure 2). Underfunding contributes to a lack of public services in Guatemala such as transportation infrastructure. Only 35 percent of Guatemalan roads were paved in 2001, and there was only 0.13 road kilometer per square kilometer of territory, compared with 0.87 road kilometer per square kilometer of territory for (similarly-sized) South Korea. It is thus possible that greater fiscal prowess by the central government in Guatemala would enable its parliament to implement new and better public services that would foster development.

South Korea is our final example. Unlike its counterpart in the North, South Korea is a constitutional democratic republic, and unlike Guatemala, it is a powerful fiscal state. South Korea became an OECD member in 1996, and its economy is among the world's largest. By 2009, per capita GDP was 28,000 U.S. dollars. South Korea has an extensive transportation network of air, bus, ferry, highway, and rail routes. Moreover, the education index for South Korea, which measures literacy and school enrollment from kindergarten to university, is ranked among the world's top 10. This evidence suggests that the South Korean government is not only able to gather large tax resources, but employs funds in productive ways that stimulate growth.

In total, our study provides rigorous proof that the key fiscal feature that distinguishes advanced economies is the institutional balance between weak and strong fiscal elements. To lay the proper institutional foundations for growth, emerging economies like Guatemala and North Korea must seek to overcome both types of fiscal problems, but not simply one or the other, just as European states once did.

Data Appendix

Data for per capita tax revenues and the control variables from 1650 to 1913 are from Dincecco (2011, Appendices A.1, A.2, A.3). These data are downloadable from the website http://sites.google.com/site/mdincecco/. See Section 4 for further details.

Data sources for military, infrastructure, and education expenditures per capita are listed as follows. Disaggregated expenditure data in home currencies were converted into gold grams following the methodology in Dincecco (2011, Appendix A.2). Data for total expenditures and population are from Dincecco (2011, Appendices A.1, A.2) unless otherwise stated. These data concern total spending by national governments including debt service and incorporate loan amounts when given. Non-military expenditures per head were computed as per capita total expenditures minus per capita military expenditures.

Austria. Military spending data are from Pammer (2010, Figure 5.1). Infrastructure and education expenditure data are not available.

Belgium. Military spending data are from Singer (1987). They were downloaded from the Correlates of War website as the National Military Capabilities Dataset, Version 4.0. Infrastructure and education expenditure data are not available.

Denmark. Military spending data are from Singer (1987). They were downloaded from the Correlates of War website as the National Military Capabilities Dataset, Version 4.0. Infrastructure and education expenditure data are not available.

England. Military, infrastructure, and education spending data are from Mitchell (1988, Public Finance Table 4). To compute military expenditures, spending for the Army and Ordnance and for the Navy were summed. Infrastructure expenditures uses the spending category for Works and Buildings, and education expenditures the category for Education, Art, and Science.

France. Military, infrastructure, and education spending data are from Fontvieille (1976, Tables CVXI-XXXV). Infrastructure expenditures uses the spending category for Public Works.

Italy. Military spending data are from the Ufficio Storico (1980, pp. 508-9) for 1861-9 and Hobson (1993) for 1870-1913. Infrastructure and education expenditures are from Brosio and Marchese (1986, Table 4a). Infrastructure spending uses the expenditure category for Public Works.

Netherlands. Military spending data are from van Zanden (1996, Table 4) for 1816-41. Van Zanden provides data averages for 1816-20, 1821-4, 1825-9, 1831-4, 1835-9, and 1841-50. The average for 1816-20 was used for 1816, the average for 1821-4 for 1821, and so on. The military spending shares closely match those from van Zanden and van Riel (2010, Table 2.1). Total expenditure data from this source were used in combination with the information on shares to back out military expenditures. For 1816-30 we divided these figures by the expenditure share for the Southern Netherlands (i.e., Belgium, Luxembourg, and their hinterlands) according to van Zanden (1996, Table 5) to derive military expenditures for the (Northern) Netherlands, as data for total expenditures from Dincecco (2011) exclude the Southern Netherlands. The source for the 1816-41 data does not distinguish between infrastructure and education spending. Rather, both are included under the expenditure category for Home Affairs. Military, infrastructure, and education spending data are from van Zanden and van Riel (2010, Table 2.3) for 1850-1913. They provide data shares at 10-year intervals for 1850, 1860, 1870, 1880, 1890, 1900, and 1913. Total expenditure data from this source were used in combination with the information on shares to back out military expenditures.

Portugal. Military, infrastructure, and education spending data are from Silveira (1987, Table 8) for 1816-27, Mata and Valério (2001, Table 1) for 1832-45, and Mata (1993, Table 1) for 1851-1913. To compute military expenditures, spending by the Ministerio da Guerra (after 1827; Exercito beforehand) and the Ministerio da Marihna were summed. Infrastructure expenditures uses spending by the Ministério das Obras Públicas. There was no education ministry over this period. Education expenditures thus uses the category for the education burden (i.e., Encargos cum Instruções). Since the total military spending calculation matches well with the Encargos cum Difesa category (and perfectly from 1884 onward), we are confident that the same holds for education.

Prussia. The German Reich (1871-1945) was a federal system and a great deal of taxing and spending was done at the state (e.g., Prussian) level. The federal government was responsible for military expenditures and welfare (Ziblatt, 2006). Spoerer (2010, Table 4.1) provides Prussian military and welfare expenditures for 1847 and 1867. After unification there are only Reich data available for these categories. These data were not used because there was no clear way of integrating the pre-1871 Prussian series with the post-1870 Reich one. Spoerer's data for Prussia were supplemented with 1820 data for military defense from Ziblatt (2006, Table 3.1). Here total Prussian expenditures from 1821 were used due to data availability.

Spain. Military spending data are from Carreras and Tafunell (2006), Table 12.8 for 1816-42 and Table 12.13 for 1845-1913. To compute military expenditures, spending by the Ministerio de Guerra (through 1842; the Minsterio de Defensa from 1845 onward) and the Ministerio de Marina were summed. The sources for the 1816-99 data do not distinguish between infrastructure and education spending. Rather, both are included under the expenditure category for the Ministerio de Estado through 1842 and the Ministerio de Fomento from 1845 onward.[37]

Sweden. Military spending data are from Krantz and Schön (2010, Table XI). At the central government level, there are no separate expenditure categories for infrastruc-

[37] Disaggregated infrastructure and expenditure data for the Ministerio de Fomento are displayed for 1900-13. These data indicate that infrastructure (Ministerio de Obras Públicas) and education (Ministerio de Educación y Cienca) comprised all of the Minsterio de Fomento's expenditures for these years.

ture or education. Rather, it is probable that both are included under the spending category for civil services. We thus use this category as a proxy for these two types of expenditures.

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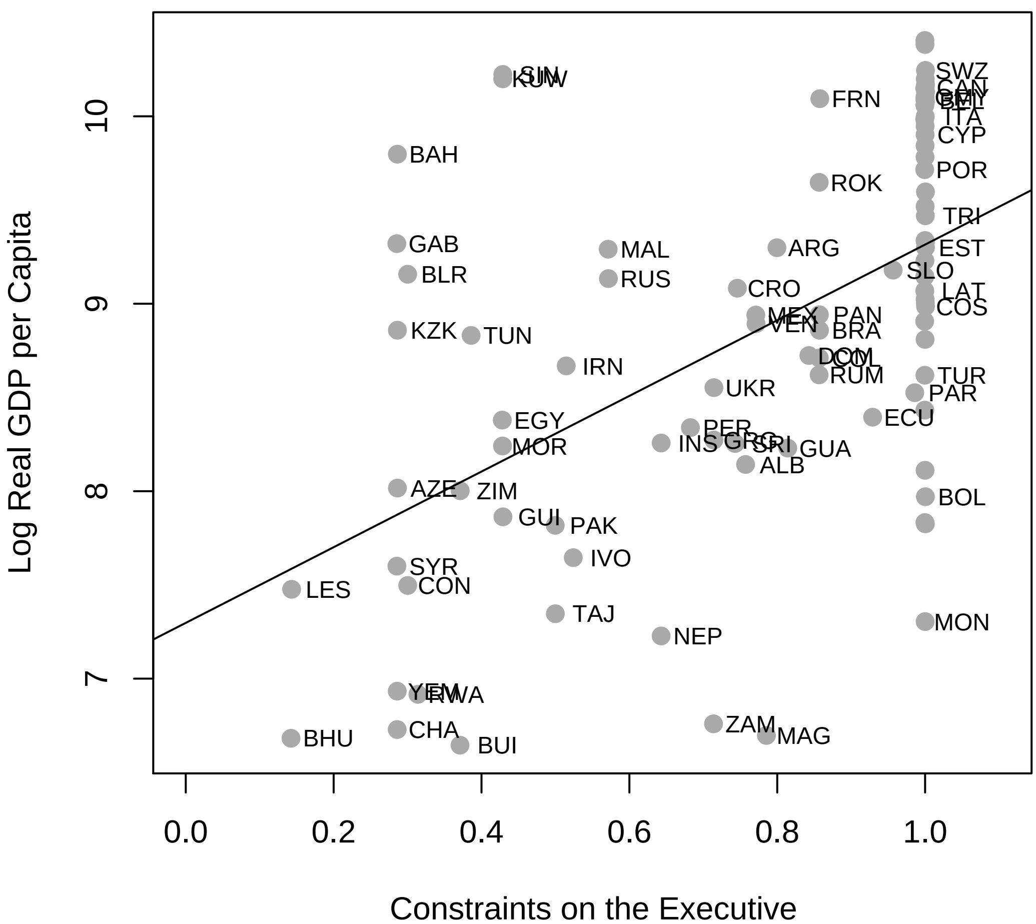
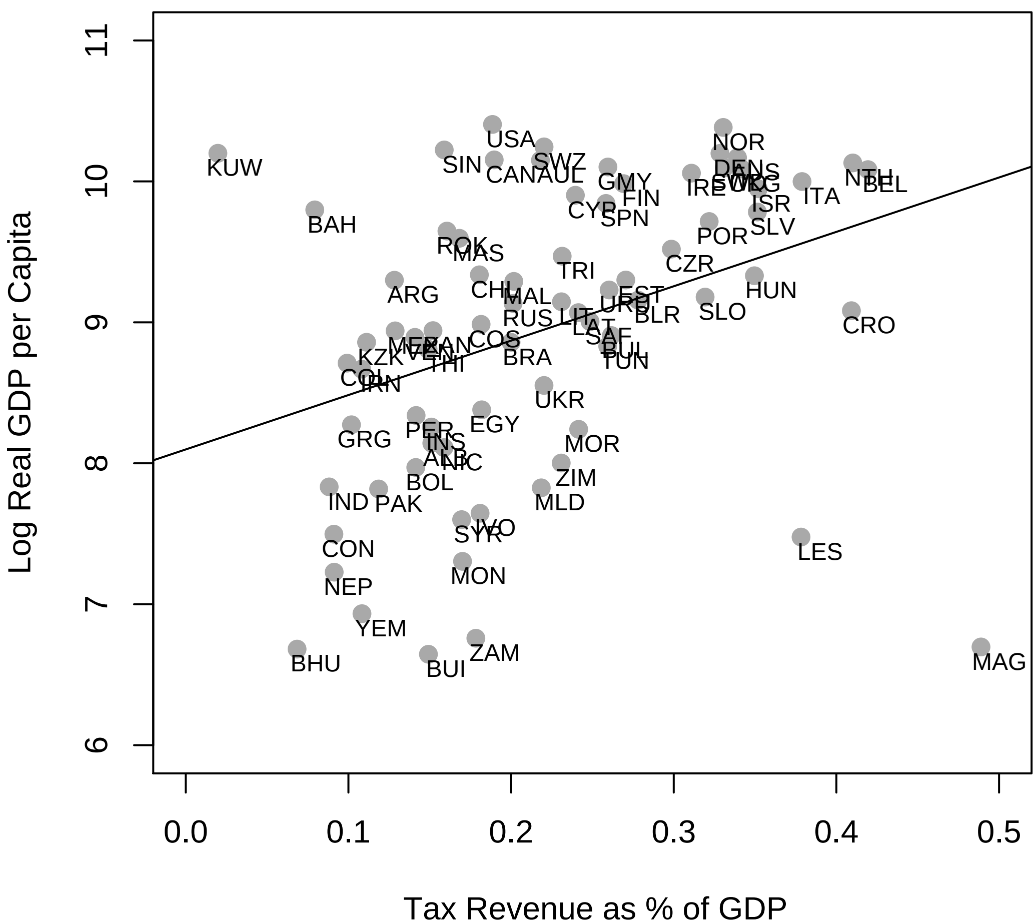
Figure 1: Constraints on the Executive and Income, 1995-2004



Source: Heston et al. (2006), Jaggers and Marshall (2008).

Note: Constraints on the executive are average constraints on the executive index normalized from 0 to 1 between 1995 and 2004 from Polity IV Database. Log real GDP per capita is average log GDP per capita in constant U.S. dollars expressed in international prices from Penn World Tables.

Figure 2: Tax Revenue and Income, 1995-2004



Source: Heston et al. (2006), International Monetary Fund (2009).

Note: Tax revenue collected by central governments as percentage of GDP is average between 1995 and 2004 from Government Financial Statistics Database. Log real GDP per capita is average log GDP per capita in constant U.S. dollars expressed in international prices from Penn World Tables.

Figure 3: Flow Chart

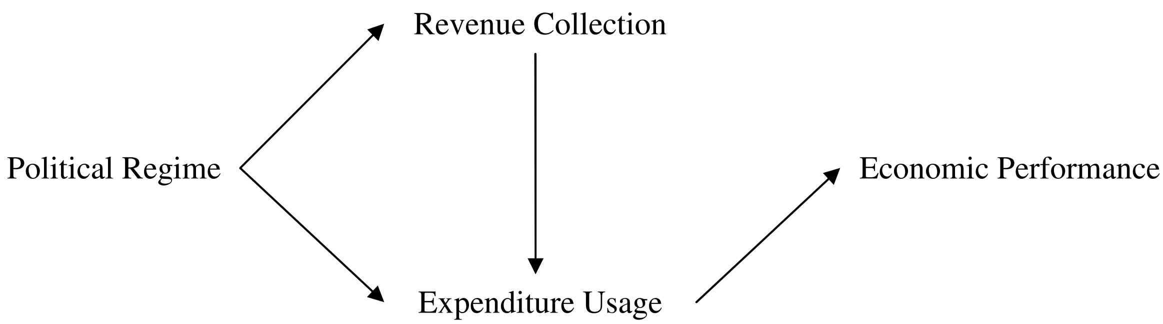
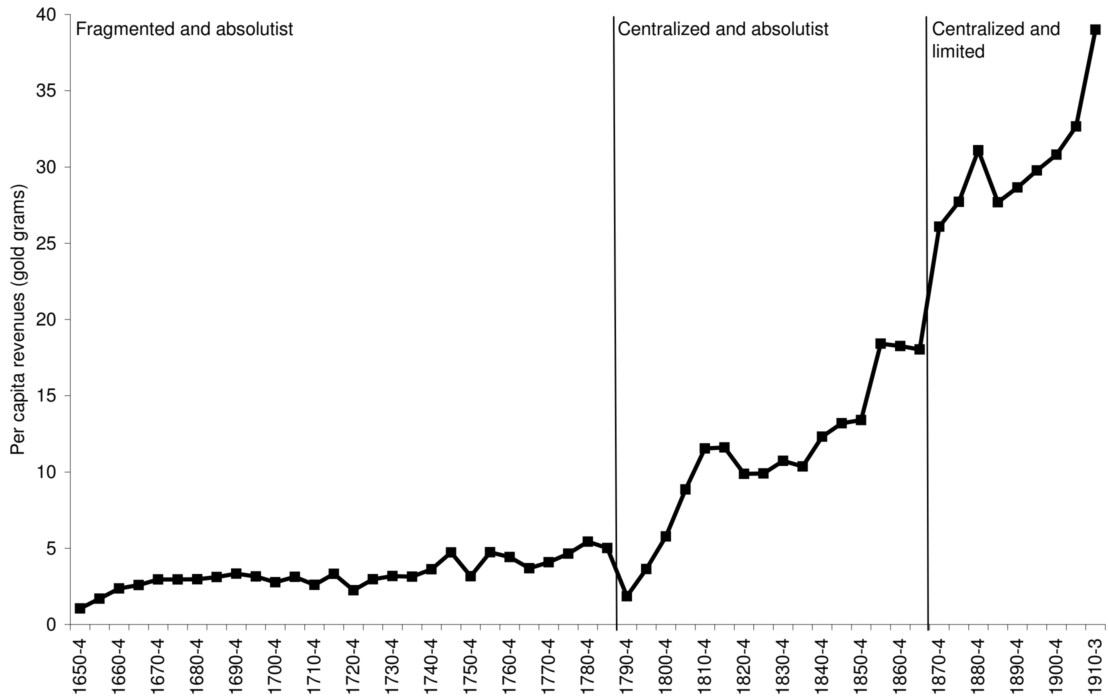
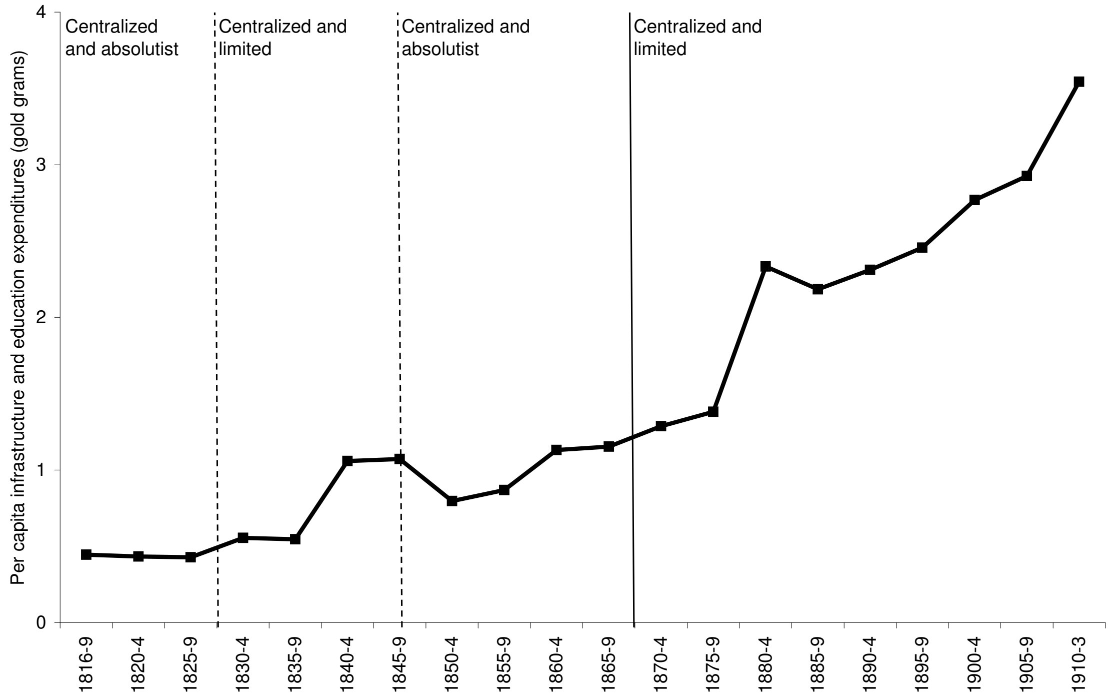


Figure 4: Per Capita Revenues, France, 1650-1913



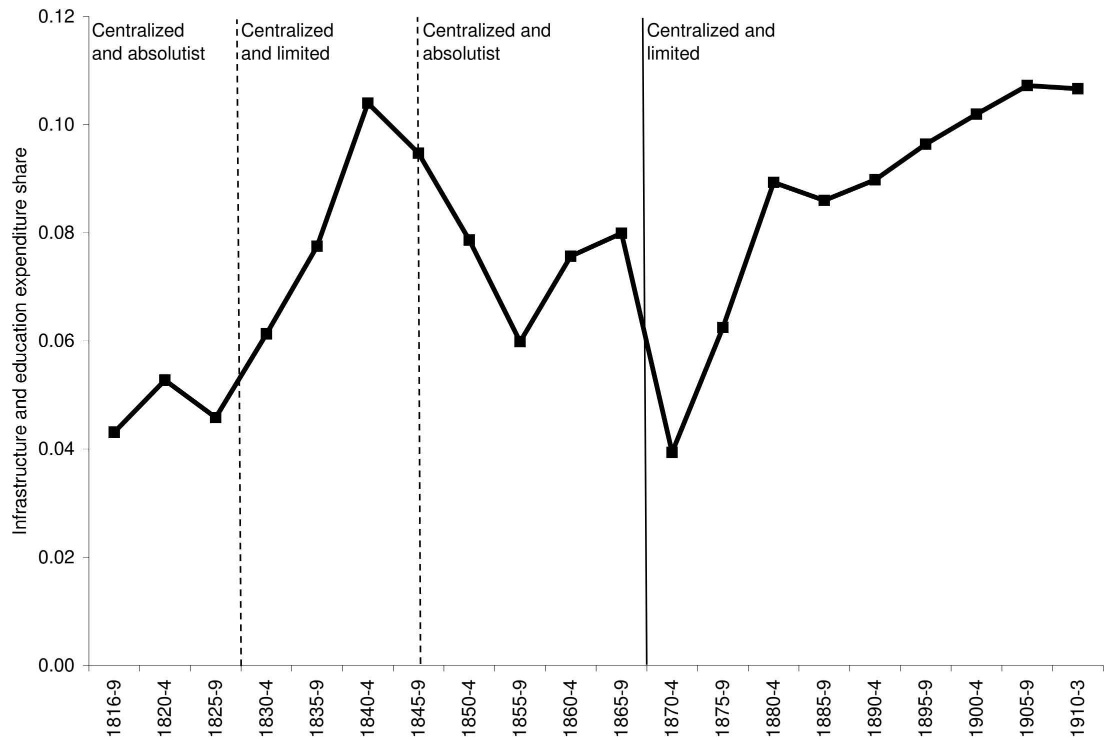
Source: Dincecco (2011).

Figure 5: Per Capita Infrastructure and Education Spending, France, 1816-1913



Source: See text.

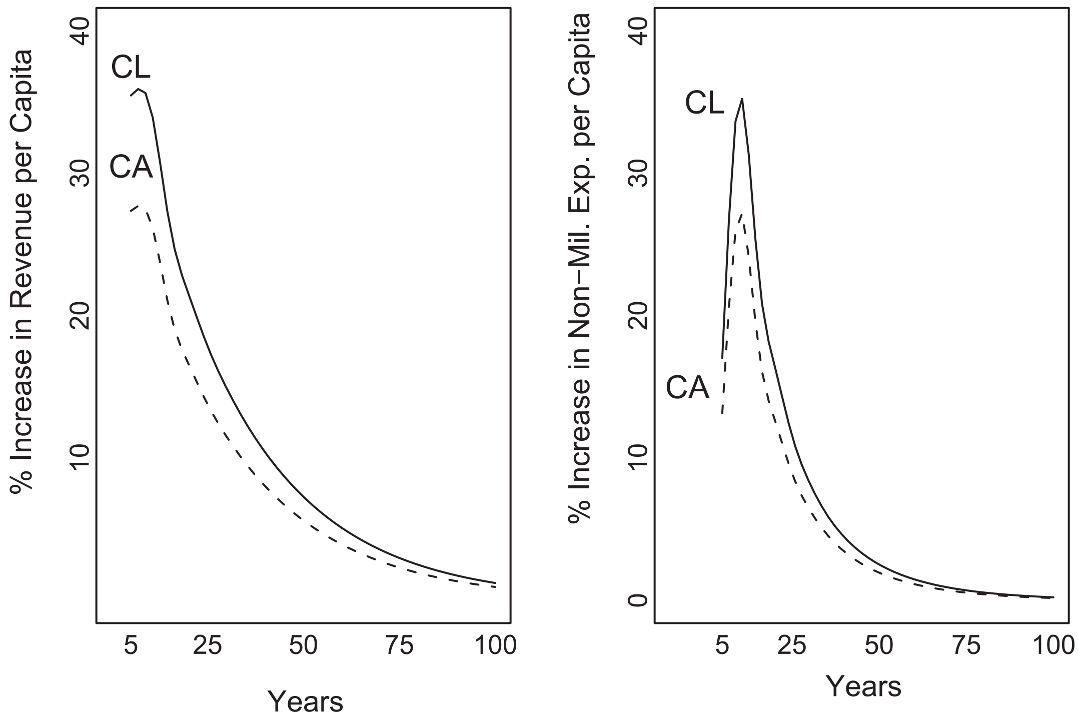
Figure 6: Infrastructure and Education Spending Share, France, 1816-1913



Source: See text.

Note: Figure displays share of infrastructure and education expenditures in total expenditures.

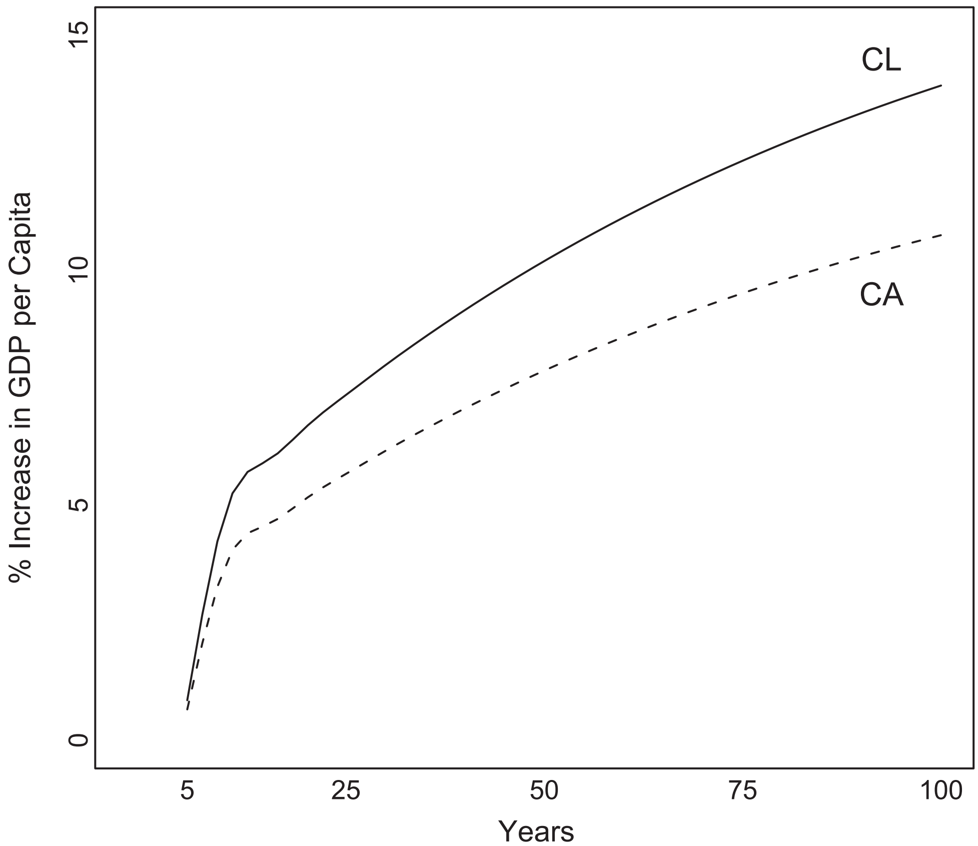
Figure 7: Dynamic Fiscal Effects of Regime Type, 1816-1913



Source: See text.

Note: CA=Centralized and absolutist, CL=Centralized and limited. Left (right) panel displays average effect of regime type on per capita revenues (per capita non-military expenditures) relative to fragmented and absolutist regime at 5-year intervals. Fragmented and limited regime excluded due to lack of observations.

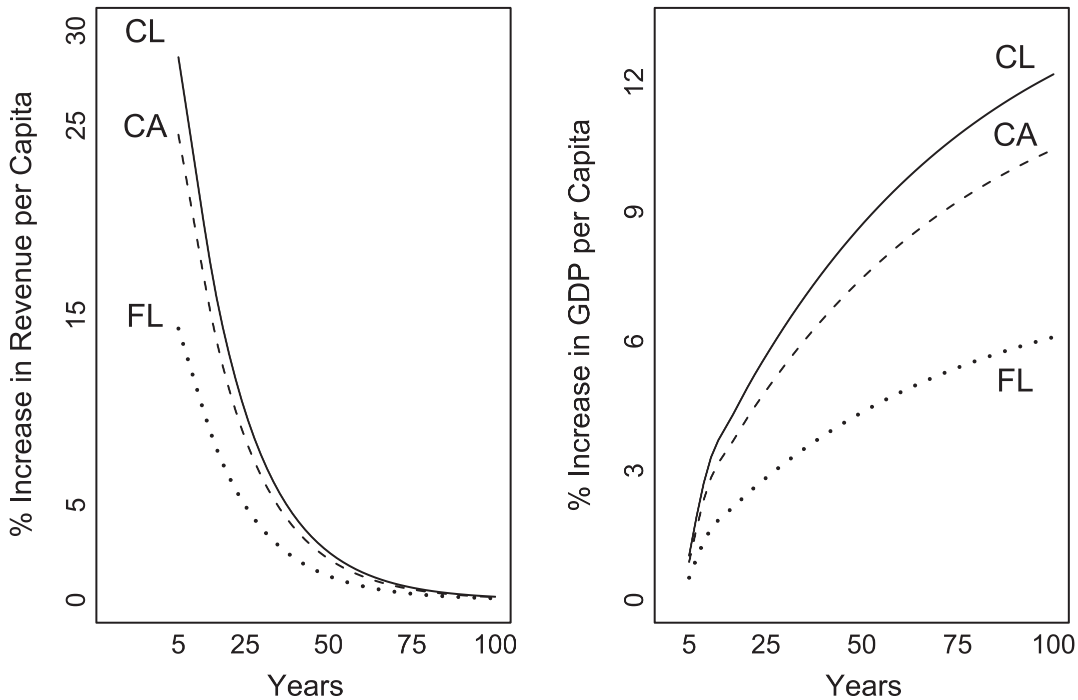
Figure 8: Cumulative Performance Effects of Regime Type, 1816-1913



Source: See text.

Note: CA=Centralized and absolutist, CL=Centralized and limited. Figure displays average cumulative effect of regime type on economic performance relative to fragmented and absolutist regime. Fragmented and limited regime excluded due to lack of observations.

Figure 9: Dynamic and Cumulative Effects of Regime Type, 1650-1913



Source: See text.

Note: CA=Centralized and absolutist, FL=Fragmented and limited, CL=Centralized and limited. Left panel displays average effect of regime type on per capita revenues relative to fragmented and absolutist regime at 5-year intervals. Right panel displays average cumulative effect of regime type on economic performance relative to fragmented and absolutist regime.

Table 1: Dates of Political Transformations

	Fiscal Centralization	Limited Government
England	1066	1688
France	1790	1870
Belgium	1795	1831
Netherlands	1806	1572-1795, 1848
Prussia	1806	1848
Spain	1845	1876
Austria	1848	1867
Portugal	1859	1851
Italy	1861	1861
Sweden	1861	1866
Denmark	1903	1848

Source: Dincecco (2011).

Note: See text for definitions of fiscal centralization and limited government.

Table 2: Fiscal and Economic Characteristics of Political Regimes

Regime Type	Revenues	Non-Military Spending	Growth
Fragmented and Absolutist	Low	Low	Low
Centralized and Absolutist	High	?	?
Fragmented and Limited	Low	High	Increases
Centralized and Limited	High	High	High

Table 3: Per Capita GDP Levels, 1650-1913

		All Regimes	FA	CA	FL	CL
Totals	Obs	356	128	57	27	144
	Mean	1,670	1,016	1,446	2,043	2,176
Austria	Obs	21	7	5		9
	Mean	1,872	1,422	1,743		2,451
Belgium	Obs	16				16
	Mean	2,662				2,662
Denmark	Obs	11			9	2
	Mean	2,908			2,378	3,439
England	Obs	53		8		45
	Mean	1,625		1,169		2,081
France	Obs	54	28	17		9
	Mean	1,581	959	1,357		2,428
Italy	Obs	10				10
	Mean	1,668				1,668
Netherlands	Obs	39		10	16	13
	Mean	2,331		2,027	1,995	2,970
Portugal	Obs	30	17		2	11
	Mean	963	907		928	1,053
Prussia	Obs	46	24	9		13
	Mean	1,459	973	1,239		2,164
Spain	Obs	43	29	7		7
	Mean	1,291	950	1,200		1,725
Sweden	Obs	33	23	1		9
	Mean	1,591	1,172	1,462		2,140

Source: Maddison (2010).

Note: FA=Fragmented and Absolutist, CA=Centralized and Absolutist, FL=Fragmented and Limited, CL=Centralized and Limited. Data are expressed in 1990 international Geary-Khamis dollars and use 5-year averages.

Table 4: Per Capita Revenues, 1650-1913

		All Regimes	FA	CA	FL	CL
Totals	Obs	356	128	57	27	144
	Mean	8.23	2.42	7.05	10.49	12.97
Austria	Obs	21	7	5		9
	Mean	7.89	3.11	6.02		14.54
Belgium	Obs	16				16
	Mean	14.78				14.78
Denmark	Obs	11			9	2
	Mean	11.90			9.80	13.99
England	Obs	53		8		45
	Mean	8.09		2.69		13.49
France	Obs	54	28	17		9
	Mean	14.31	3.32	11.01		28.60
Italy	Obs	10				10
	Mean	14.41				14.41
Netherlands	Obs	39		10	16	13
	Mean	12.20		10.86	12.07	13.66
Portugal	Obs	30	17		2	11
	Mean	1.38	0.76		0.96	2.42
Prussia	Obs	46	24	9		13
	Mean	6.32	3.62	3.84		11.51
Spain	Obs	43	29	7		7
	Mean	2.35	1.00	2.34		3.72
Sweden	Obs	33	23	1		9
	Mean	5.29	2.89	3.63		9.36

Source: Dincecco (2011).

Note: FA=Fragmented and Absolutist, CA=Centralized and Absolutist, FL=Fragmented and Limited, CL=Centralized and Limited. Data are expressed in gold grams and use 5-year averages.

Table 5: Per Capita Non-Military Spending, 1816-1913

		All Regimes	FA	CA	FL	CL
Totals	Obs	165	27	29	10	99
	Mean	6.90	1.81	6.95	7.27	11.57
Austria	Obs	20	6	5		9
	Mean	8.26	2.77	6.01		16.00
Belgium	Obs	16				16
	Mean	14.74				14.74
Denmark	Obs	11			8	3
	Mean	10.19			8.06	12.32
England	Obs	19				19
	Mean	12.15				12.15
France	Obs	20		11		9
	Mean	15.03		9.92		20.15
Italy	Obs	9				9
	Mean	12.85				12.85
Netherlands	Obs	10		4		6
	Mean	12.95		13.00		12.89
Portugal	Obs	19	6		2	11
	Mean	1.18	0.46		0.83	2.24
Prussia	Obs	3		2		1
	Mean	3.86		2.72		5.00
Spain	Obs	19	6	6		7
	Mean	1.80	0.71	1.88		2.81
Sweden	Obs	19	9	1		9
	Mean	3.98	1.61	3.34		6.98

Source: See Appendix.

Note: FA=Fragmented and Absolutist, CA=Centralized and Absolutist, FL=Fragmented and Limited, CL=Centralized and Limited. Data are expressed in gold grams and use 5-year averages.

Table 6: Infrastructure and Education Spending, 1816-1913

		All Regimes	FA	CA	FL	CL
Panel A: Per Capita Infrastructure Expenditures						
Totals	Obs	70	0	13	2	55
	Mean	0.64		0.68	0.21	1.02
England	Obs	19				19
	Mean	0.23				0.23
France	Obs	20		11		9
	Mean	0.84		0.68		1.00
Italy	Obs	9				9
	Mean	2.92				2.92
Netherlands	Obs	6				6
	Mean	1.57				1.57
Portugal	Obs	13			2	11
	Mean	0.35			0.21	0.48
Prussia	Obs	3		2		1
	Mean	1.34		0.67		2.02
Panel B: Per Capita Education Expenditures						
Totals	Obs	70	0	13	2	55
	Mean	0.37		0.29	0.04	0.78
England	Obs	19				19
	Mean	0.72				0.72
France	Obs	20		11		9
	Mean	0.64		0.11		1.18
Italy	Obs	9				9
	Mean	1.29				1.29
Netherlands	Obs	6				6
	Mean	0.51				0.51
Portugal	Obs	13			2	11
	Mean	0.06			0.04	0.08
Prussia	Obs	3		2		1
	Mean	2.17		1.31		3.03

Source: See Appendix.

Note: FA=Fragmented and Absolutist, CA=Centralized and Absolutist, FL=Fragmented and Limited, CL=Centralized and Limited. Data are expressed in gold grams and use 5-year averages.

Table 7: Estimation Results, 1650-1913

	(1)	(2)	(3)	(4)	(5)	(6)
	Standard GMM	Filtered GMM	Standard GMM	Filtered GMM	Standard GMM	Filtered GMM
Panel A: Dependent Variable is Economic Performance Measure						
	GDP_t	GDP_t	GDP_t	GDP_t	$Urban_t$	$Urban_t$
Per capita $revenues_t$	0.03^{***}	0.06^{***}	0.02^{***}	0.05^{***}	0.04^{***}	0.05^{***}
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Per capita GDP_{t-1}	0.95^{***}	0.89^{***}	0.91^{***}	0.88^{***}		
	(0.03)	(0.05)	(0.04)	(0.06)		
Urbanization $rate_{t-1}$					0.93^{***}	0.91^{***}
					(0.06)	(0.08)
Per capita $revenues_{t-1}$	0.01^{***}	0.02^{***}	0.01^{***}	0.02^{***}	0.01^{**}	0.04^{***}
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
External war dummy	−0.02	−0.04	−0.01	−0.02	−0.01	−0.02
	(0.03)	(0.05)	(0.01)	(0.03)	(0.02)	(0.05)
Internal war dummy	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Initial state capacity	0.14^{***}	0.17^{***}	0.11^{***}	0.15^{***}	0.08^{**}	0.14^{***}
	(0.03)	(0.05)	(0.02)	(0.04)	(0.03)	(0.05)
Population	0.08^{***}	0.13^{***}	0.08^{**}	0.11^{**}	0.05	0.058^{**}
	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.05)
Literacy rate			0.06	0.08^{**}		
			(0.04)	(0.04)		
P-value of Wald χ^2	0.00	0.00	0.00	0.00	0.03	0.00

Table 7, Continued: Regression Results, 1650-1913

	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Dependent Variable is Per Capita Revenues$_t$						
Centralized and absolutist regimes	0.18***	0.24***	0.19***	0.26***	0.27***	0.35***
	(0.04)	(0.03)	(0.04)	(0.03)	(0.09)	(0.07)
Fragmented and limited regimes	0.09	0.14*	0.01*	0.15**	0.15**	0.22**
	(0.05)	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)
Centralized and limited regimes	0.21***	0.28***	0.22***	0.29***	0.32***	0.45***
	(0.07)	(0.09)	(0.06)	(0.08)	(0.14)	(0.14)
Per capita revenues$_{t-1}$	0.69***	0.74***	0.65***	0.69***	0.63***	0.71***
	(0.07)	(0.12)	(0.08)	(0.13)	(0.08)	(0.13)
Per capita GDP$_t$	0.27*	0.35**	0.25**	0.37**		
	(0.15)	(0.15)	(0.13)	(0.14)		
Urbanization rate$_t$					0.10	0.12
					(0.12)	(0.15)
Per capita GDP$_{t-1}$	0.21	0.29*	0.22	0.29**	0.19	0.26
	(0.16)	(0.15)	(0.16)	(0.14)	(0.17)	(0.17)
External war dummy	0.06	0.10	0.05	0.10	0.05	0.08
	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)	(0.07)
Internal war dummy	0.02	0.04	0.03	0.04	0.01	0.02
	(0.06)	(0.07)	(0.06)	(0.07)	(0.04)	(0.05)
Initial state capacity	0.12***	0.14***	0.14***	0.16***	0.06**	0.11***
	(0.03)	(0.05)	(0.03)	(0.06)	(0.03)	(0.05)
Population	0.06**	0.11**	0.05	0.10**	0.4	0.07
	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.05)
Literacy rate			0.05	0.07**		
			(0.04)	(0.03)		
P-value of Wald χ^2	0.00	0.00	0.00	0.00	0.00	0.00
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Linear time trend	Yes	Yes	Yes	Yes	Yes	Yes
Observations	345	345	287	287	68	68
Number of countries	11	11	8	8	11	11

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

Note: Revenue, GDP, and population data are in natural logarithms. Data in Columns (1) to (4) use 5-year averages, and data in Columns (5) and (6) use 25-year averages. Robust standard errors are in parentheses.

Table 8: Estimation Results, 1816-1913

	(1)	(2)	(3)	(4)	(5)
Panel A: Dependent Variable is Per Capita GDP$_t$					
Per capita non-military exps$_t$	0.05***	0.06**			
	(0.01)	(0.02)			
Scaled railway km$_t$			0.10**		
			(0.04)		
Per capita infrastructure exps$_t$				0.12***	
				(0.02)	
Per capita education exps$_t$					0.07***
					(0.01)
Per capita GDP$_{t-1}$	0.91***	0.90***	0.87***	0.88***	0.90***
	(0.03)	(0.03)	(0.04)	(0.02)	(0.03)
Per capita non-military exps$_{t-1}$	0.03***	0.03***			
	(0.01)	(0.01)			
Scaled railway km$_{t-1}$			0.06*		
			(0.04)		
Per capita infrastructure exps$_{t-1}$				0.05***	
				(0.01)	
Per capita education exps$_{-1}$					0.03***
					(0.01)
Per capita revenues$_{t-1}$	0.02**	0.02**	0.03***	0.04***	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
External war dummy	−0.03***	−0.02*	−0.03***	−0.03***	−0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Internal war dummy	−0.02**	−0.02*	−0.04***	−0.03***	−0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Initial state capacity	0.28***	0.29***	0.11**	0.27***	0.29***
	(0.07)	(0.07)	(0.07)	(0.05)	(0.06)
Population	0.06**	0.08**	0.07*	0.10**	0.12***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Literacy rate		0.12***			
		(0.02)			
P-value of Wald χ^2	0.00	0.00	0.00	0.00	0.00

Table 8, Continued: Regression Results, 1816-1913

	(1)	(2)	(3)	(4)	(5)
Panel B: Dependent Variable is Non-Military Exps or Railway Km					
	Nonmil_t	Nonmil_t	RR km_t		
Per capita revenues_t	0.48^{***}	0.44^{***}	0.45^{***}		
	(0.09)	(0.08)	(0.10)		
Per capita non-military exps_{t-1}	0.67^{***}	0.61^{***}			
	(0.08)	(0.07)			
Scaled railway km_{t-1}			0.47^{***}		
			(0.11)		
Per capita revenues_{t-1}	0.20^{**}	0.22^{***}	0.22^{**}		
	(0.08)	(0.07)	(0.09)		
Per capita GDP_{t-1}	0.28^{**}	0.29^{**}	0.30^{***}		
	(0.12)	(0.11)	(0.10)		
External war dummy	0.03	0.04	0.04		
	(0.05)	(0.05)	(0.05)		
Internal war dummy	0.11^{**}	0.12^{***}	0.08^{**}		
	(0.04)	(0.03)	(0.04)		
Initial state capacity	0.22^{***}	0.19^{***}	0.17^{**}		
	(0.07)	(0.06)	(0.07)		
Population	0.11^{**}	0.11^{***}	0.07^{**}		
	(0.04)	(0.04)	(0.04)		
Literacy rate		0.11^{***}			
		(0.03)			
P-value of Wald χ^2	0.06	0.03	0.04		

Table 8, Continued: Regression Results, 1816-1913

	(1)	(2)	(3)	(4)	(5)
Panel C: Dependent Variable is Per Capita Revenues$_t$					
Centralized and absolutist regimes	0.27***	0.24***	0.29***		
	(0.07)	(0.06)	(0.08)		
Centralized and limited regimes	0.35***	0.37***	0.36***		
	(0.05)	(0.06)	(0.05)		
Per capita revenues$_{t-1}$	0.81***	0.80***	0.77***		
	(0.08)	(0.07)	(0.10)		
Per capita GDP$_t$	0.53***	0.51***	0.51***		
	(0.17)	(0.14)	(0.13)		
Per capita GDP$_{t-1}$	0.33***	0.34**	0.37**		
	(0.16)	(0.15)	(0.18)		
Per capita non-military exps$_{t-1}$	0.21**	0.22**			
	(0.09)	(0.07)			
Scaled railway km$_{t-1}$			0.18**		
			(0.01)		
External war dummy	0.06**	0.06**	0.08		
	(0.03)	(0.02)	(0.05)		
Internal war dummy	0.11**	0.12**	0.13**		
	(0.05)	(0.05)	(0.07)		
Initial state capacity	0.27**	0.26**	0.21**		
	(0.09)	(0.08)	(0.01)		
Population	0.12**	0.11**	0.09*		
	(0.09)	(0.05)	(0.05)		
Literacy rate		0.10***			
		(0.03)			
P-value of Wald χ^2	0.00	0.00	0.00		
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Linear time trend	Yes	Yes	Yes	Yes	Yes
Observations	169	126	194	65	65
Number of countries	11	11	11	6	6

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

Note: The estimation method is doubly-filtered GMM. Revenue, expenditure, railway, GDP, and population data are in natural logarithms. Data use 5-year averages. Robust standard errors are in parentheses.