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Abstract: In 1650, most European countries suffered from fiscal fragmentation and absolutist rule, though by the start of World War I many of these same states had centralized institutions and limited government. Using a newly assembled panel data set of per-capita revenues for five of the largest and/or most important players at the time – Britain, France, the Netherlands, Prussia, and Spain – this paper carries out a systematic analysis of political regimes and public revenues over the 17th to 20th centuries. The results suggest that both centralized and limited government regimes were associated with significantly higher levels of per-capita revenues than fragmented and absolutist ones, even after controlling for other economic and political factors. Tests for structural breaks reinforce these findings, revealing close relationships between major turning points in revenues series and political transformations.

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1. Introduction

Most European states faced two major fiscal problems in 1650. Nearly all rulers had absolute discretion, enabling them to spend funds as they wished. Rulers often chose personal consumption (e.g. foreign military adventures) over public services that would most benefit society (e.g. roads). Hence, their power had to be limited. Central governments also suffered from divided authority, forcing them to bargain with various local bodies over tax amounts. Localities often attempted to free ride on the contributions of others, leaving states starved for revenues. Thus, fiscal systems had to be centralized, enabling a single authority to gain control over tax collection.

The current political economy literature centers on the problem of absolute discretion, suggesting that limited government is crucial to growth.¹ Yet Acemoglu (2005) shows that there is a strong positive relationship between powerful states – where central governments raise hefty tax sums and play significant economic roles – and per-capita wealth levels. Fiscal fragmentation also remains severe in certain poor parts of the world. Herbst (2000) finds a close relationship between divided fiscal authority and economic stagnation in Africa, for instance.² Since dictators also plague many African states, we find a direct link with past European regimes, where rulers had great control over expenditures but less command over revenues.

One useful way to improve our understanding of the effects of absolutism and fragmentation on public finances is to examine the evolution of fiscal systems over the long term, making Europe ideal for study. There we find a clear pattern of economic and

² This theme is more prominent in the political science literature than the economics one. Also see Migdal (1988), Wade (1990), and Bates (2001), among others.
political changes from 1650 to 1913, as European states replaced Old Regime institutions with modern ones. Such an inquiry is valuable because countries around the world have implemented European forms of fiscal governance. As mentioned, many of today’s developing nations face problems similar to those experienced in earlier periods by European ones.

We find a different sort of one-sidedness when reviewing the historical political economy literature. Hoffman and Norberg (1994), Bonney (1999), Bordo and Cortès-Conde (2001), and others describe fiscal evolution in Europe in intimate detail. Like much of the historical literature, these texts focus on case studies, separating countries by chapter. Yet there is an implicit cost to this approach: in the absence of rigorous analysis across states, the generality of such findings remains unclear. ³

In a well-known paper, North and Weingast (1989) claim that institutional changes with the Glorious Revolution of 1688 enabled the English crown to make a credible commitment to responsible fiscal policies. ⁴ Thus, the state had better access to credit, because investors had confidence in the ruler’s ability to repay loans. Since the time that the article was first published, many other scholars have examined the relationship between limited government and public debt. ⁵ This line of research overlooks a

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³ Some scholars have studied European fiscal history in a purely comparative way. Tilly (1990) and Bonney (1995) provide voluminous qualitative accounts. For an abridged version in this vein, see O’Bien (2001). More recently, Stasavage (2005) uses econometric techniques to evaluate the politics of sovereign borrowing in Europe from 1274-1785 while Dincecco (2006b) tests the relationship between political regimes and sovereign credit risk from 1750-1913. Also see Van Zanden and Prak (2006).

⁴ It is unclear whether institutional changes resulting from the Glorious Revolution actually improved property rights protections. Clark (1996) argues that secure property rights existed in England from at least 1600. Similarly, O’Brien (2001) argues that England implemented the constitutional and administrative structures underlying its fiscal state in the 1640s.

fundamental point, however, which is the direct impact of limited government on public revenues.

Indeed, Epstein (2000) claims that North and Weingast conflate the economic benefits of limited government with those of institutional centralization, arguing that economic and political fragmentation within states rather than fiscal abuse by rulers was the main cause of economic distortions before the 1800s.\(^6\) Centralized from early on, England was the exception to this rule.\(^7\) Though Epstein correctly notes that discussions of absolutist power – which presuppose the existence of strong, centralized institutions – carry less weight in fragmented environments, he relies on case histories of pre-modern Italian states as evidence.

Centralization of economic and political institutions often occurred on the Continent during French Revolutionary and Napoleonic times (1789-1815). Afterwards, many Continental states – now with centralized but absolutist regimes – resembled pre-1688 England, suggesting that it was no longer anachronistic to examine how ruler limits (or lack thereof) influenced public finances. Even in absolutist regimes, parliamentary bodies exercised control over taxation, inducing rulers to procure extra-legal revenues to wage wars and stifle opposition. With undivided fiscal authority, one might argue that monarchs gained new powers that enabled them to undermine private property rights more easily. In fact, this is just the sort of problem that North and Weingast envisioned when describing the virtues of limited government, which constrained the behavior of rulers.

\(^6\) Epstein writes that “...absolutism was largely a propaganda device devoid of much practical substance (13).” Hoffman and Norberg (1994) also downplay the “...absolute in absolutism (393).” Similarly, Fritschy (2003) argues that a tax revolution (i.e. fiscal centralization) rather than a financial one (i.e. limited government) enabled the Dutch Republic (1584-1795) to become a great power. See Henshall (1992), Rosenthal (1998), and Dincecco (2006a, 2006b) as well.

This paper examines the public finance consequences of the political transformations identified by Epstein (2000) and North and Weingast (1989), performing a systematic cross-country analysis of the effects of political regimes on per-capita revenues collected by European states from 1650 to 1913. By pursuing a rigorous quantitative approach, it intends to complement existing qualitative studies.

In particular, I assemble a panel data set on per-capita revenues for five of the largest and/or most important players in Europe at the time: Britain, France, the Netherlands, Prussia, and Spain. After identifying fiscal centralization and the rise of limited government within European states, I carry out a multivariate regression analysis of the public finance effects of political regimes, controlling for relevant economic and political factors. The results show that both centralized and limited government regimes were associated with significantly higher levels of per-capita revenues than fragmented and absolutist ones, suggesting that political regimes mattered. I supplement the panel regressions with a structural change analysis that assumes no a priori knowledge of possible breaks, revealing close relationships between major turning points in revenues series and political transformations.

The rest of the paper proceeds as follows. Section 2 dates fiscal centralization and limited government and section 3 characterizes the expected relationships between political regimes and per-capita revenues levels. Section 4 describes the data used and the sample states selected. Section 5 presents suggestive evidence. Section 6 discusses the control variables, section 7 introduces the econometric design, and section 8 presents the panel regression results. Section 9 performs the robustness checks for structural breaks. Section 10 concludes.
2. Political Transformations in Europe

In 1650, most European states suffered from fiscal fragmentation and absolutist rule, though by 1913 many of these same states had centralized institutions and limited government. To start, we must distinguish clearly between divided fiscal authority and absolute fiscal discretion. Divided fiscal authority was a problem that encompassed geographical space, involving negotiations over tax revenues between central and local governments. Absolute fiscal discretion was a problem contained within the central government itself, involving interactions between the ruler and organized national bodies like parliament over fiscal policy.\(^8\)

Indeed, there was a close link between the two problems before the 19\(^{th}\) century. Fragmented sovereignty in the form of powerful local assemblies, laws, and notables constrained the predatory capacities of European monarchs, suggesting that divided fiscal authority “limited” absolutist power.\(^9\) Once central and local bodies had struck tax deals, however, rulers had great control over how to spend state funds.

Following North and Weingast’s (1989) influential claim that relates budgetary control by parliament to improvements in public finances, my characterization of limited government refers exclusively to the problem of absolute discretion, meaning that a political regime could have been divided in terms of fiscal authority but unlimited in terms of fiscal policy. I will make this definition more explicit in section 2.4. For now, we may say that a state was limited if and only if parliament possessed a regular constitutional right to monitor how the crown spent tax revenues. This standard makes sense because one

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\(^8\) When necessary, I use the generic term “parliament” to refer to this class of institutions, which took on various names depending on the era and/or state.

important aspect of the paper is to test whether the North and Weingast hypothesis – much cited but not often subject to rigorous quantitative analysis – generally holds. Since governments faced a variety of economic and political constraints, such precision is also necessary, or else many sorts of institutional arrangements could be considered limited.

2.1 Fiscal Fragmentation

Prior to the 19th century, most European states were fiscally fragmented. In France, the crown had to negotiate independently over tax amounts with powerful regional bodies, meaning that the central government applied uneven fiscal pressure across locales based upon the particular deal struck. Whole towns and provinces often avoided certain duties, as did elites. One example is the taille, a valuable land tax from which nobles in central and northern France received exemptions by the middle of the 15th century. Farther south, nobles only paid the taille on certain holdings. Over time, magistrates, royal officers, and bourgeois won comparable privileges. The evidence suggests that divided fiscal authority made it difficult for the crown to raise enough in revenues: three episodes of government default plagued France over the 18th century prior to the Revolution, for instance.

In Spain, the crown had to implement new taxes on top of old ones rather than make much-needed structural changes because tax agreements among (i.e. united) Spanish kingdoms were too difficult. For instance, Bourbon reformers in the early 1700s chose to

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10 Dincecco (2006a) performs a cross-country analysis of fragmentation in Europe from 1700-1871, finding that fiscal zones were small because of divided authority through the start of the French Revolution (1789).


12 Defaults occurred in 1713, 1759, and 1770. Never total, nor random in nature, they involved suspension of reimbursement payments in times of crisis, reform that restored high interest rates back to the legal maximum of 5 percent, or repudiation that reduced nominal yields below the legal maximum. See Velde and Weir (1992), 5, 8-10, Sargent and Velde (1995), 480-491, and White (2001), 84-95.
superimpose an additional tax in Spain’s eastern provinces, called the *catastro* in Catalonia, the *contribució unique* in Aragon, and the *equivalente* in Valencia. As in France, there was regional variation in tax rates dependent upon the bargain made.\(^{13}\)

For these fragmented states, local tax authority was closely intertwined with political autonomy, prompting elites to resist fiscal reforms that threatened their incumbent rights. The result was a classic public goods problem. Each locality attempted to free-ride on the tax contributions of others, resulting in low per-capita revenues collected by central governments. A final fact: 18\(^{th}\) century absolutist regimes in France and Spain levied smaller per-capita taxes than republican Britain or the United Provinces, suggesting at least in part the detrimental role of fragmentation.\(^{14}\)

### 2.2 Fiscal Centralization

Fiscal centralization was a centuries-long process that included all of the measures taken to assess and collect tax revenues. In many European countries, however, deep structural changes were imposed during French Revolutionary and Napoleonic times (1789-1815), producing a remarkable difference in the degree of centralization before and after this era.

To make systematic comparisons across states possible, I have chosen a simple definition of fiscal centralization, which occurred the year that the state’s central government first secured its revenues through a tax system with uniform rates throughout the country.\(^{15}\) As shown in table 1, this political transformation took place swiftly and

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\(^{15}\) This does not imply that the central government gained a total monopoly over taxation after centralization. In the United States, for example, fiscal centralization occurred with the Constitution of 1788, which gave Congress the power to ensure that individual states complied with national tax standards. Under the Articles
permanently on the Continent from 1789 to 1815.\textsuperscript{16} In France itself, the introduction of a national tax system occurred during the 1790s.\textsuperscript{17} The French conquered the Dutch Republic in 1795, prompting the replacement of decentralized institutions with centralized ones.\textsuperscript{18} Indeed, the simple threat of French takeover was at times enough to instigate change: Prussia made quick fiscal and legal reforms after defeat in battle in 1806.\textsuperscript{19}

Two exceptions bear mention. On one hand, England possessed fiscally centralized institutions from very early on. On the other, Napoleon did not aggressively pursue economic and political reforms on the Iberian Peninsula, meaning that fiscal centralization in Spain came relatively late (i.e. the 1840s). For additional details, please see appendix 1.

With undivided fiscal authority, central governments forced their domains to adhere to standard tax rates, overcoming the free-riding problem caused by fragmentation. By equalizing taxes at relatively high levels, per-capita revenues rose. It is worth pointing out that – in stark contrast to the previous century – no French defaults occurred during the 1800s, suggesting that fiscal centralization reduced the relative attractiveness of this option by enabling the state to raise enough in revenues.

\textbf{2.3 Absolutism}

Even in absolutist regimes where monarchs spent funds as they wished, parliamentary bodies exercised authority in tax matters, prompting rulers to seek alternative resources through fiscal predation. Such strategies were not simply a response

\textsuperscript{16} Also see Godechot, Hyslop, and Dowd (1971).

\textsuperscript{17} Upon taking power in 1789, the National Assembly transformed the French tax system, eliminating old privileges and exemptions. After his coup in 1799, Napoleon completed the process of tax rationalization. See Bordo and White (1991), 314-316, and White (1995), 234-241, 250-252.

\textsuperscript{18} Van Zanden and Van Riel (2004), 40-51.

\textsuperscript{19} Godechot, Hyslop, and Dowd (1971), and Kiser and Schneider (1994).
to divided authority. One important revenue stream for King Charles I (1625-1649) of England was loans under threat (i.e. “forced loans”), repaid in highly unpredictable ways and in terms altered from original agreements. From 1626 to 1627, Charles raised 260,000 pounds by this method. From 1634 onwards, he gathered an average of 107,000 pounds per year. Charles seized private goods as well, confiscating 130,000 pounds in bullion stored on government property from private merchants in 1640. Other measures to skirt parliament included customs impositions and the sale of monopolies, government lands, and offices. He also kept parliament in the dark about the state of English finances.¹⁰

Elsewhere in Europe, we may imagine a close link between divided fiscal authority and predatory tactics prior to the 1800s. Sovereigns secured new tax revenues with fiscal centralization, though, ostensibly making it easier to fulfill debt obligations. Yet by the start of the 19th century most regimes still lacked effective constraints limiting the ways in which rulers could use state funds.

In the Netherlands, fiscal unification occurred in 1806. At the end of the Napoleonic era, the Kingdom of the United Netherlands emerged, investing King Willem I (1814-1840) with absolutist powers. Budgets were submitted to parliament at 10-year intervals, meaning that the monarch was able to use an overwhelming portion of the funds that parliament had originally voted for as he saw fit. Moreover, parliament was unable to audit how Willem spent tax revenues and received little information about the state of public finances.

Unsurprisingly, the king was able to include many favored items in his 10-year budgets of 1819 and 1829. Though fiscal centralization nearly doubled the size of the

Dutch tax base and Europe remained politically stable, Willem found it difficult to balance the national accounts. Under his reign, the public debt increased from roughly 575 million florins in 1814 to 900 million florins in 1830 and 1200 million florins in 1840, amounting to more than 200 percent of GDP, a debt ratio comparable to that of war-ridden Napoleonic times. Partly in response to the excesses of fiscal absolutism, limited government – which I examine more closely in the following section – emerged in the Netherlands in the 1840s.\footnote{Fritschy and Van Der Voort (1997), 64-66, 75-81, and Van Zanden and Van Riel (2004), 32-51, 85-90, 96-110, 171-178.}

In the absence of constitutional constraints, parliaments rightfully feared that kings would spend additional funds granted to them in reckless and wasteful ways. They therefore demanded fiscal limits as a precondition to provide new revenues. Unwilling to bow to such requests, rulers often resorted to predatory fiscal tactics. For these reasons, individuals resisted tax requests more fervently, suggesting that per-capita revenues collected by central governments remained low.

### 2.4 Limited Government

As for fiscal centralization, parliamentary control over state finances increased gradually over time. A reasonable definition of limited government must capture parliament’s real power to act rather than its mere presence. It must also be simple enough to apply similarly to all states.

With these factors in mind, I define limited government to have emerged the year in which parliament gained the stable constitutional right to control the state’s annual budget. To meet my criteria, parliament’s power had to hold for at least two consecutive decades. I have also selected years and regimes for which there is widespread academic consensus to make dating as objective as possible. In addition to historical accounts, my
coding of limited regimes corresponds closely with the classification systems used in De Long and Shleifer’s (1993) study of absolutist and republican regimes in Europe prior to 1800, Acemoglu, Johnson, and Robinson’s (2005) work on European trade, institutions, and growth from 1500 to 1850, and Jaggers and Marshall’s (2005) Polity IV project on political regime characteristics and transitions from 1800 onwards.²² By incorporating these three factors – regularity, stability, and scholarly agreement – we may be confident that political regimes were limited in a manner that closely replicates the standard that North and Weingast originally laid out for England.²³

The Dutch case well illustrates this approach. As discussed in the previous section, the constitution of the Kingdom of the United Netherlands granted absolutist powers to King Willem I. Though parliament possessed control over the budget, this authority only came at 10-year intervals, rendering it ineffective. The crown also kept parliament in the dark about state finances: it was not until 1839 that Dutch fiscal troubles became public. In a rare display of strength, parliament vetoed the budget that covered the upcoming decade, leading to Willem’s abdication in 1840. Afterwards, Willem II acceded to the Dutch throne and a constitutional amendment was passed that replaced 10-year budgets with 2-year ones and made information about government finances widely available. A truly liberal era in the

²² De Long and Shleifer employ three measures: a binary indicator of absolutist versus non-absolutist regimes; Putnam’s 8-point constitutional scale; and Tilly’s (1990) categories of “capital” versus “coercion.” All are coded at 150-year intervals. Acemoglu, Johnson, and Robinson use two measures: Polity IV categories of executive constraints and categories of “protection for capital,” each coded at 100-year (1000-1700) or 50-year (1700-1850) intervals. Since the Polity IV data set does not begin until the 19th century, the authors assign their own values beforehand. All of the computations use 40-year windows around each date (e.g. the 1800 value is the average of 1780, 1790, 1800, 1810, and 1820), however, reducing the precision of individual point estimates. Jaggers and Marshall’s Polity IV project classifies executive constraints for states at yearly intervals from 1800-2004. Their scale ranges from 1-7, where 1 = unlimited executive authority, 3 = slight to moderate limits on executive authority, 5 = substantial limits on executive authority, and 7 = executive subordination. Values 2, 4, and 6 represent intermediate categories. To map the Polity IV scale into my classification system, I interpret values 1-4 as “absolutist” and 5-7 as “limited.” For additional details, please see appendix 1.

²³ I have not made use of suffrage measures to identify limited government regimes since I am concerned with effective checks on executive power rather than democracy per se.
Netherlands, replete with a new constitution, did not emerge until the Year of Revolutions in 1848, however. Most importantly, the Dutch crown had to submit annual budgets to parliament for approval, which in the words of Van Zanden and Van Riel (2004) became the cornerstone of parliamentary power.\textsuperscript{24} I thus conclude that it is only after 1848 that the triple criteria for limited government of regularity, stability, and consensus are satisfied. My characterization of political regimes in the Netherlands over the 1800s also matches up well with Acemoglu, Johnson, and Robinson (2005) and Jaggers and Marshall’s (2005) codes for 19\textsuperscript{th} century Dutch institutions.\textsuperscript{25}

Table 1 indicates that in general the limited government political transformation began to take place during the 1830s and 1840s, several decades after fiscal centralization. As mentioned, the major exceptions were England, which became limited nearly 150 years prior to any of the Continental states, and Spain, where it did not emerge until 1876 following decades of failed constitutional initiatives. For additional details, please refer to appendix 1.

Limited government strengthened parliament’s right to levy taxes and reduced the ruler’s ability to violate private rights to financial property. Parliament also controlled the state’s purse strings, reducing the likelihood of poor fiscal choices by the ruler. In light of these twin developments, investors were more willing to purchase public debt at lower rates of interest. Hence, per-capita revenues rose.

\textsuperscript{24} Fritschy and Van Der Voort (1997), 73-77, 85-87, and Van Zanden and Van Riel (2004), 32-51, 85-90, 96-110, 171-178.
\textsuperscript{25} Acemoglu, Johnson, and Robinson’s two measures classify the Netherlands as 4 (slight to moderate limits on executive authority/some merchant rights) in 1800 and 5 or 6 (substantial limits on executive authority/effective parliamentary representation) in 1850. The authors use 40-year averages around each date to compute values, however, reducing the precision of their point estimates. Jaggers and Marshall’s Polity IV yearly measure of executive constraints characterize the Netherlands as 1 (unlimited executive authority) from 1815-1839, 3 (slight to moderate limits on executive authority) from 1840-1847, 5 or 6 (substantial limits on executive authority) from 1848-1888, and 7 (executive subordination) from 1889-1913.
Before discussing the yield data, it is worthwhile to mention some other points about the dating of political regimes. To bias against my hypothesis, I have always chosen the earliest possible year to define political regimes as either centralized or limited. Since per-capita revenues generally grew from the 17th to the 20th centuries, average revenue levels associated with both centralized and limited regimes will be lower than otherwise, meaning that the results will be more robust if I still find that centralized and limited regimes were associated with significantly higher per-capita revenues than fragmented and absolutist ones.

To illustrate, one might argue that limited government did not truly emerge in Germany until after World War II, implying that 19th century Prussia never possessed such a regime. One may also claim similarly that limited government did not emerge in Spain until after Franco’s death in 1975. In these cases, the correct tests would be to categorize data prior to the 20th century in absolutist regimes and those during the 20th century in limited ones. As per-capita revenues in Europe have risen over time, this classification would almost certainly strengthen any results that both centralized and limited regimes were associated with level increases in per-capita revenues.

During the 19th century, limited government on the Continent was also susceptible to political upheaval, which I control for in the econometrics portion of the paper. For now, it is enough to recall that my definition ensures a minimum standard for stability by requiring that parliament’s constitutional veto power held for at least two consecutive decades. It would not only be impractical to require that limited government was a “permanent” reform, but for reasons described above, pushing back the dates for limited government would likely reinforce any results that centralized and limited regimes led to improvements in public finances.
I present France as a final case study of my dating methodology. Though limited in name only, the Bourbon regime established itself as a constitutional monarchy following Napoleon’s final defeat in 1815. The next several years saw intense battles between royal and liberal forces. King Charles X engaged in major abuses of power during the 1820s, ultimately inciting the July Revolution of 1830. In turn, Charles’ replacement, Louis Phillipe, agreed to adhere more closely to constitutional limits on his power. The 1830 regime endured for less than two decades, however, ending in revolution in 1848. Just three years later, Napoleon III mounted a coup d’etat, establishing an authoritarian regime that lasted until 1870. The Third French Republic then came into existence, surviving until the German invasion of 1940.26 This final arrangement best satisfies the triple criteria of regularity, stability, and consensus, and therefore I date the emergence of a centralized and limited regime to 1870. As for the Netherlands, my characterization of political regimes in France corresponds closely with De Long and Shleifer (1993), Acemoglu, Johnson, and Robinson (2005), and Jaggers and Marshall’s (2005) codes for French institutions.27

3. Implications for Political Regimes

Table 2 provides a summary of the public finance characteristics of the three possible political regimes: fragmented and absolutist, centralized and absolutist, and

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27 De Long and Shleifer’s three measures characterize France as absolutist from 1650-1800. Acemoglu, Johnson, and Robinson’s two measures classify it as 1 (unlimited executive authority/no effective capital protection) in 1600, 1700, and 1750, 4 (slight to moderate limits on executive authority) and 5 (effective parliamentary representation) in 1800, and 5 (substantial limits on executive authority/effective parliamentary representation) in 1850. The authors use 40-year averages around each date to compute values, however, reducing the precision of their point estimates. Jaggers and Marshall’s Polity IV yearly measure of executive constraints characterize France as 1 (unlimited executive authority) from 1800-1813, 3 (slight to moderate limits on executive authority) from 1814-1829, 5 (substantial limits on executive authority) from 1830-1850, 1 from 1852-1859, 3 from 1863-1868, 5 in 1869, and 7 (executive subordination) from 1877-1913. Years 1851, 1860-1862, and 1870-1876 are considered transition periods.
centralized and limited.\textsuperscript{28} Revenues under centralized and limited regimes should have been higher than under fragmented and absolutist ones. Fiscal centralization implies an increase in revenues over fragmentation, because central governments resolved the problem of local tax free-riding. Similarly, limited government implies an increase in revenues over absolutism, since rulers were able to make a credible commitment to honor property rights and spend funds on public services rather than on personal consumption, making individuals more willing to submit to tax requests.\textsuperscript{29}

Revenues should have also increased under centralized and absolutist regimes in comparison with fragmented and absolutist ones, since fiscal centralization had taken place in the first case, solving the problem of local free-riding. In turn, this suggests that revenues under centralized and limited regimes should have been higher than under centralized and absolutist ones, since limited government addressed the problem of fiscal absolutism as well.

The intensity of these implications depends on the magnitude of the private information problem that European states faced. A priori, each locality was uncertain about how the ruler would use new revenues generated by (i.e. possible) fiscal centralization. If local authorities perceived that the problem was severe, then there would have been great fear that the ruler would spend revenues on personal ends rather than on public services. Each locality would have thus resisted tax reforms by the state more fervently, meaning that public finances in fragmented and absolutist regimes would have been in very poor shape indeed. In particular, we would expect aggregate revenues on public goods to have

\textsuperscript{28} Examples of fragmented and limited regimes are rare in European history. There are none among sample states.
\textsuperscript{29} By curbing the personal consumption of rulers, however, limited government may have reduced revenues needs and thus levels, thereby partially offsetting this positive effect.
been low, suggesting that limited government rather than fiscal centralization should have had a greater impact on public finances, since individuals did not trust rulers to pursue sound fiscal policies in the absence of parliamentary oversight.

If taxpayers were relatively confident that the ruler would spend new revenues on public services rather than on personal ends, however, then public finances under fragmented and absolutist regimes would have already been decent, meaning that political transformations should have mattered less overall. To be precise, we would expect aggregate revenues on public goods to have been relatively high, suggesting that fiscal centralization rather than limited government should have had a greater impact on public finances, since changes to unify institutions and reduce transactions costs were more important than parliamentary budget control.

4. Revenues Data

I constructed a database on annual revenues and population from several secondary sources. For details, please see appendix 2.

The historical data is not without limitations. First off, European states did not keep detailed financial records during the 17th and 18th centuries, meaning that the series may be imprecise. Annual revenues data is also missing in some years for some states. I have often interpolated intermediate years. Since there were few dramatic changes to tax bases other than fiscal centralization during this period, the interpolated figures should provide reasonable estimates. The same logic applies to population figures, which I also interpolated in certain cases. No major population shocks such as plague occurred for the period under consideration, suggesting that the interpolated figures should be decent approximates as well. Data also came in different currencies. To make calculations
comparable across states, I transformed all units into grams of gold. These shortcomings notwithstanding, trends and levels of per-capita revenues remain useful as basic indicators of public finances and political regimes in Europe from 1650 to 1913.

As sample states, I selected Britain, France, the Netherlands, Prussia, and Spain because of historical relevance and data availability. These countries were among the largest and/or most important players in Western Europe over the period under consideration, suggesting that they will provide a fair representation of the European experience. Of equal significance, annual data series of nearly two centuries or more covering per-capita revenues as well as a variety of controls exists for each. Data is also generally available for a minimum of fifty years both before centralized and absolutist regimes and after centralized and limited ones, providing more than enough observations to compare steady-state yield levels. Lack of data led to the exclusion of several other states, among them Austria, Belgium, German ones like Bavaria, Italian ones like the Papal States, Piedmont, and Naples, and Scandinavian ones like Finland, Norway, and Sweden.

Cut-off years for fiscal centralization and limited government are relatively clear among sample countries. One exception is Spain, where political risk ran high over the 19th century. Historical significance and sufficiently long data series compensated for this shortcoming, however. By the same logic, I excluded Portugal, Spain’s Iberian counterpart, because of political instability and data limitations.

5. Suggestive Evidence

Table 3 displays the summary statistics for the revenues panel. In total, there are 1121 observations, 378 for fragmented and absolutist regimes, 230 for centralized and

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30 For details, please see appendix 1.
absolutist ones, and 513 for centralized and limited ones. What jumps out immediately is the significantly higher average per-capita revenues associated with centralized and absolutist regimes (7.22 grams of gold) and centralized and limited ones (13.86 grams of gold) relative to those of fragmented and absolutist ones (2.40 grams of gold).

Such evidence – which fails to control for economic factors or political risks – is suggestive rather than definitive. Before moving on to the formal statistical analysis, however, it is worthwhile to look at the French and Dutch cases. For additional historical details, please refer back to section 2.

Figure 1, which plots annual per-capita revenues over political regimes in France from 1650 to 1913, indicates that revenues remained low at less than 5 grams of gold per-capita under the fragmented and absolutist regime that lasted through the 1780s. The French Revolution (1789-1799) led to the establishment of a national tax system. Coinciding in time with the Revolutionary and Napoleonic wars, we observe a sharp increase in revenues through 1815, doubling to approximately 10 grams of gold per-capita. Over the next two decades, French revenues leveled out but never fell. Revenues again began to increase in the 1840s – albeit at a slower rate than during Napoleonic times – to almost 20 grams of gold per capita by the end of the 1860s. With the establishment of a centralized and limited regime in 1870, we observe another sharp increase in revenues, doubling over the next four decades to 40 grams of gold per capita by the start of World War I.

Each of the seven provinces that comprised the Dutch Republic (1584-1795) had its own systems of administration, taxation, and representation. Due to data unavailability, I have culled revenues and population figures through the Republic’s fall from Holland, the
wealthiest and most heavily populated province. Within Holland itself, the date 1574 – the
year in which the provincial government extended common taxes from urban areas to rural
ones – marked the establishment of a centralized tax system.\textsuperscript{31} Note that the Republic
remained fiscally fragmented at the national level, however.

The Dutch case well illustrates why it is difficult at times to draw meaningful
distinctions between the terms “limited” and “absolutist” before the 19\textsuperscript{th} century. Though
constrained, Holland was not limited in the sense of a parliament that controlled the
province’s annual budget.\textsuperscript{32} After discussion with knowledgeable scholars, I have chosen
to designate the political regime in Holland as centralized and limited. This
characterization also matches up well with those of Tilly (1990), De Long and Shleifer
(1993), Acemoglu, Johnson, and Robinson (2005), and Stasavage (2005), all of whom
consider the Netherlands to be a republic over the 18\textsuperscript{th} century. Figure 3, which plots
annual per-capita revenues over political regimes in the Netherlands from 1719 to 1913,
highlights the success of Holland’s fiscal system, indicating large revenues of around 15 to
20 grams of gold per head.\textsuperscript{33}

Fiscal centralization occurred at the national level in 1806. The Kingdom of the
United Netherlands emerged at the end of the Napoleonic era, investing King Willem I
(1814-1840) with absolutist powers. With the shift from a centralized and limited regime
to a centralized and absolutist one, revenues were nearly halved from pre-1795 levels to

\textsuperscript{31} The province greatly increased its collection of per-capita revenues in the years following fiscal
centralization, suggesting that this reform reduced free-riding in Holland. See t’Hart (1989), 666-670, t’Hart

\textsuperscript{32} To provide a credible commitment to repay debts, ruling elites invested heavily in government debts,

\textsuperscript{33} Also see Van Zanden and Prak (2006), 129-135.
roughly 10 grams of gold per capita.\textsuperscript{34,35} The revolutions of 1848 saw the establishment of a centralized and limited regime in the Netherlands. In turn, Dutch revenues grew steadily, reaching approximately 15 grams per capita by the 1870s, a level reminiscent of that of the centralized and limited regime in Holland during the previous century.

6. Control Variables

In addition to political regimes, several other economic and political factors may have influenced public revenues from 1650 to 1913, meaning that the only way to confirm the positive effect of both centralized and limited regimes is to run regressions that incorporate a relevant set of control variables. Rigorous controls also help to account for potential regime misclassifications, since no matter how diligently one tries, it is impossible to eliminate idiosyncratic elements from the dating procedures.

Presumably, economic growth increased central government tax bases, enabling states to collect larger revenues. Many studies of the late 19\textsuperscript{th} century employ measures of foreign trade as approximates of national output.\textsuperscript{36} Systematic trade deficit and export series from 1750 onwards are not available for each of the sample states considered here, however. Scholars such as Hohenberg and Lees (1985), Bairoch (1988), and Acemoglu, Johnson, and Robinson (2002, 2005) have argued that changes in urbanization rates and per-capita income within European states coincided closely for the period under

\textsuperscript{34} Upon its establishment, the Kingdom of the United Netherlands included southern provinces such as Belgium, which declared independence in 1831. To compute Dutch revenues, I net out the contributions of such regions, resulting in the trough from 1816-1831 observed in figure 2. For additional details, please see appendix 2.

\textsuperscript{35} In the Republic, all provinces were required to pay a quota amount to finance collective military expenditures. As the most important among them, Holland was responsible for almost 60 percent of the total burden, resulting in higher per-capita taxes. Indeed, Van Zanden and Van Riel (2004) argue that other provinces frequently shirked their financial obligations, free-riding on Holland’s defense contributions.

\textsuperscript{36} See, for instance, Mauro, Sussman and Yafeh (2002), Obstfeld and Taylor (2003), and Ferguson and Schularick (2006).
consideration. Following these authors, I proxy for per-capita GDP by constructing a variable that calculates the urban population as a percentage of the total population annually for each sample state. As a robustness check, I make use of Maddison’s (2003) per-capita GDP figures.

I also consider monetary policy as part of the set of economic controls. Scholars such as Bordo and Rockoff (1996) and Obstfeld and Taylor (2003) argue that adherence to the classic gold standard from the 1870s to the start of World War I sent a valuable signal of financial integrity to investors. Though these authors focus on sovereign credit risk, one might also wish to assess the impact of monetary policies such as the classic gold standard on public revenues. To account for this possible effect, I incorporate a dummy variable that takes a value of one for each year that a state was on gold. Coding for gold is at times subjective, however, since states such as Spain “shadowed” the standard while never making an official commitment. Following Obstfeld and Taylor (2003) and Ferguson and Schularick (2006), I rely on Meissner’s (2002) “strict” dates at which a currency became *de facto* and *de jure* convertible into gold by law.37

Another factor affecting public revenues may have been international and domestic political conflicts. Ferguson (2006) claims that through 1880 political events mattered more to investors than economic ones because there was a greater amount of regular information available about them, arguing that both wars and revolutions decreased tax revenues. Sussman and Yafeh (2000, 2006) also find that financial markets responded

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37 Adherence to rigorous standards like those of the classic gold era was uncommon before 1850. Indeed, Mertens (1944) and Morys (2006) warn that one must be careful to avoid anachronistic applications of metallic standards and bank note convertibility. For this reason, I have abstained from testing for the effects of bimetal or silver regimes prior to the 1870s. Please see appendix 3 for additional details regarding European monetary regimes.
quickly to civil unrest and wars in Meiji-era Japan and 18th century Britain, further indicating the importance of controlling for political risks.

To assess the impact of warfare on revenues, I incorporate a dummy variable that identifies each year(s) from 1650 to 1913 in which sample states were engaged in a European military conflict. To measure the impact of political turbulence, I add a dummy variable that takes a value of one for each year(s) of civil war, coup, or revolution within states over the same period. Country fixed effects are used to capture constant but unmeasured features of states and (i.e. annual) time fixed effects to capture the impact of common European (i.e. economic, political, social, and technological) events particular to certain years.

As a last point, we must remember that the analysis biases against finding any significant relationship between political regimes and public revenues by assuming that it is in fact possible to neatly disentangle such regimes from economic factors and political conflicts, though theory suggests that they influenced all of these factors.38

7. Estimating the Effect of Political Regimes

As Ferguson and Schularick (2006) note, panel data estimations are a common method to analyze large historical datasets, increasing informative content by combining variations across time and place. The estimation technique used here – OLS with panel-corrected standard errors, or PCSE – is standard for quantitative endeavors into comparative political economy.39

38 For additional details about the control variables, please see appendix 3.
39 For robustness, I have also run the regressions with feasible generalized least squares (FGLS), which generates very similar results.
Use of per-capita revenues as the dependent variable presents two problems. The first is that it does not control for serial correlation. The second is that urbanization may have facilitated tax collection by central government authorities, calling into question its usage as an instrument to proxy for per-capita GDP on the right-hand side of the regression equation. To address such issues, the best solution would be to employ a yearly ratio of central government revenues to GDP as the dependent variable. Yet reliable GDP figures are difficult to come by before 1820. I thus constructed a similar ratio using urbanization rates as proxies for per-capita GDP. For robustness, the second specification substituted Maddison’s (2003) real per-capita figures into the denominator. Note that use of real GDP data further reduces potential inflation effects, which were already diminished by converting revenues figures into grams of gold.

I look to the coefficients on dummy variables for centralized and absolutist regimes and centralized and limited ones relative to fragmented and/or absolutist regimes to estimate the effect of political regime type on resulting per-capita revenues levels. Recall from the introduction that – though fiscal reforms in Europe occurred gradually over time – an influential strand of the historical literature highlights two distinct structural transformations: fiscal centralization and limited government. I do not wish to estimate the magnitudes of public revenues changes in the weeks and months following such institutional changes, but rather to capture steady-state yield levels associated with different sorts of political regimes. The dummy variable approach is well suited for the present inquiry because it provides a clear and simple method to do so.
8. Econometric Evidence

Table 4, which displays the results of the panel regressions, reveals that centralized and absolutist regimes and centralized and limited ones were associated with significantly higher per-capita revenue levels than fragmented and absolutist regimes, improving public finances. The findings hold whether yearly ratios of central government revenues to urbanization rates (specification 1) or per-capita GDP figures (specification 2) are incorporated as the dependent variable.

What about the other control variables? Gold standard adherence was also associated with higher per-capita revenues levels, significantly so in the second specification. Contrary to Ferguson’s (2006) claim, warfare was associated with significant increases in per-capita revenues, suggesting that central governments intensified collection efforts in times of war. Civil wars, coups, and revolutions, on the other hand, were associated with a decrease in revenues, suggesting that domestic turmoil made it difficult for states to gather taxes.

Before moving to the structural breaks analysis, it is worthwhile to reconsider how the particular way in which European history unfolded may have influenced the econometric findings. Fiscal centralization and the rise of limited government often took place after the start of the Industrial Revolution, which was associated with a rapid rise in per-capita incomes on the Continent during the 19th century. Indeed, centralized and limited regimes existed when Europe was at its wealthiest over the sample period. I have controlled for possible income effects in the regressions by using revenues ratios with per-capita GDP figures or urbanization proxies in the denominator as dependent variables and gold standard adherence and yearly fixed effects as independent ones.

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Though it might also be useful to run the same set of regressions from 1650 to 1799, thereby reducing the impact of the Industrial Revolution, the vast majority of regime shifts occurred during the 1800s, making this approach impractical. A second glance at the transformations that occurred prior to the 19th century proves helpful in this regard, however. To start, recall from section 5 that – as figure 1 depicts – per-capita revenues increased dramatically in the years that followed fiscal centralization in France in 1790. Another look at the Dutch case is also valuable, since the Netherlands was the only sample state for which there was a shift from a centralized and limited regime “back” to an absolutist one. Figure 2 suggests a sharp drop in per-capita revenues associated with this political change, which occurred at the start of the 1800s. The British case is also instructive. Figure 3, which plots annual per-capita revenues over political regimes in Britain from 1650 to 1750, indicates that revenues roughly doubled in the years following the establishment of limited government in 1688. In total, the pre-1800 evidence further suggests that political regimes had important effects on central government revenues that were independent of per-capita income growth associated with the Industrial Revolution.

9. Structural Breaks Analysis

Though the political transformations that I have identified correspond with exogenously given historical events, they are endogenous in the sense that I have chosen the precise years to mark regimes as centralized and as limited. As an additional robustness check, I thus employ an alternative specification in the spirit of Willard, Guinnane, and Rosen (1996), Brown and Burdekin (2000), Sussman and Yafeh (2000), and Mauro, Sussman, and Yafeh (2002) that assumes no a priori knowledge of possible breaks in the revenues series for sample states.
The procedure, based on Bai and Perron (2003), identifies multiple structural changes in means while allowing for serial correlation. It selects a maximum number of “best” breaks subject to a minimum number of observations between data segments.\(^{41}\) As Willard, Guinnane, and Rosen (1996) discuss, there is always a trade-off in determining parameter values. A minimum space of two observations eliminates the chance of confounding effects but ends up analyzing blips rather than turning points.\(^{42}\) On the other hand, extended spans increase the likelihood of missing important shifts. After some experimentation, I have selected the best three to four breaks with at least 20 observations (i.e. 20 years) per segment. Though some level of arbitrariness was inevitable in this choice, the findings are quite robust to changes in parameter values.

Due to the imperfect nature of the data, we should interpret the structural change findings with caution. With that said, table 5 displays the results of individual breaks tests that regress annual revenues-to-GDP ratio on yearly lags of the dependent variable, revealing close relationships between major turning points and political transformations.\(^{43}\) In Britain, the break that occurred in 1688 coincided with the Glorious Revolution and the establishment of limited government. For France, we observe major turning points with fiscal centralization (1793) and the end of the Napoleonic era (1818) as well as limited government (1869). In Prussia, the best breaks were associated with warfare (1713 and 1773), fiscal centralization (1813), and limited government (1847).

As described in section 5, data limitations mean that the Dutch per-capita revenues series is comprised of data for Holland through 1794 and for the Netherlands as a whole.

\(^{41}\) The Bai-Perron approach thus improves upon the “moving windows” technique that relies on sequential single structural change methods. Both suggest similar break points, however.
\(^{42}\) I do not analyze short-lived breaks since I am interested in persistent changes.
\(^{43}\) Tests that use natural logarithms of yearly per-capita revenues or annual revenues-to-urbanization ratios deliver similar results.
from 1803 onwards. The resulting gap (1795-1802) divides the sample and makes it impossible to identify a potential turning point around the time of fiscal centralization (1806). Hence, I perform separate tests for the best one to two breaks that occurred during the 18th and 19th centuries each. Table 5 displays turning points associated with warfare and political turmoil (1748) during the 1700s and the Belgian Revolution (1830) and limited government (1850) during the 1800s.

There is a similar lack of data in Spain from 1789 to 1812. I thus restrict structural tests to the best two breaks over the 19th century, when both Spanish political transformations occurred. Table 7 indicates a turning point (1846) following fiscal centralization (1844). We also observe a loose relationship between the break that occurred in 1866 and the establishment of limited government (1876).

10. Conclusion

This paper examines the relationship between political regimes and public revenues in European states from 1650 to 1913. Fiscal centralization resolved the problem of local tax free-riding by granting undivided fiscal authority to central governments. Limited government enabled states to make credible commitments to sound policies by reducing the fiscal discretion of rulers. The results indicate that political regimes mattered. I find significant increases in per-capita revenues levels associated with both centralized and limited government regimes relative to fragmented and absolutist ones, even after controlling for economic factors and political risks. Structural breaks tests that assume no a priori knowledge of possible turning points in the revenues series reinforce these findings.

The significant level increases in per-capita revenues that we observe after limited government indicate that European states faced serious problems of private information. In
this sense, the results concur with the conventional wisdom that limited government counts by enabling rulers to make a credible commitment to sound fiscal policies. Yet the findings also highlight the role of fiscal centralization. States are not necessarily born strong, as much of the current literature assumes. Indeed, fragmentation within European states created just as many headaches as absolutism, suggesting that centralization is also necessary to develop efficient systems of public finance.\textsuperscript{44}

\textsuperscript{44} To complement the revenues work, my current research examines the relationship between political regimes, gross expenditures, and spending patterns in Europe for the same period.
Appendix 1. Political Regimes

I define fiscal centralization to have occurred the year in which the state’s central government secured its revenues through a tax system with uniform rates throughout the country. Similarly, I define limited government to have emerged the year in which parliament gained the stable constitutional right to control the state’s annual budget. To meet my criteria, parliament’s power had to hold for at least two consecutive decades. For additional details, please see section 2 of the text.

England (Britain). 45 Fiscal centralization occurred during medieval times in England: both Brewer (1989) and Sacks (1994) argue that England possessed strong, national institutions by the end of the 12th century. I thereby date fiscal centralization to the arrival of the Normans (1066), which greatly contributed to the establishment of uniform rule by undercutting provincial authority. Following North and Weingast (1989), the Glorious Revolution (1688) established parliament’s power of the purse, granting it a regular veto over state expenditures along with the right to monitor crown spending.46 My characterization of the rise of limited government in England also matches up closely with the ways in which De Long and Shleifer (1993), Acemoglu, Johnson, and Robinson (2005), and Jaggers and Marshall (2005) have coded political regimes and transitions there.47 For additional details, please see sections 1 and 2 of the text.

France. Please see text, sections 2 and 5.

The Netherlands. Please see text, sections 2 and 5.

Prussia. Following French defeat in the Battle of Jena-Auerstedt in 1806, the Prussian government hastened to carry out economic and political reforms, including fiscal centralization.48 Pressure to furnish a liberal constitution grew over the first half of the 19th century. It was granted by King Freidrich Wilhelm IV during the Year of Revolutions in 1848. As elsewhere on the Continent, the young constitutional regime was imperfect. In the 1860s, for instance, the Prussian government operated without legislative approval of the military budget.49 50 De Long and Shleifer (1993) and Acemoglu, Johnson, and Robinson (2005) classify

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45 Acts of Union assimilated England with Wales in 1536, with Scotland in 1707, and with Ireland in 1800. In 1921, Ireland was partitioned into two states, the Irish Free State and Northern Ireland, which remains part of the United Kingdom. Brown (1991), 13-16, and Daunton (1995), 271-273. For additional details, please see appendix 2.
46 Brewer (1989), 3-7, 143-154, and Sacks (1994), 14-23. Note that O’Brien (2001) makes a convincing argument that the crucial juncture in English financial history was the civil war of the 1640s rather than the Glorious Revolution. Also see Clark (1996), who claims that secure property rights existed in England from at least 1600. The panel data set does not begin until 1750, however, a point by which there is widespread agreement that England possessed a centralized and limited regime.
47 De Long and Shleifer’s three measures characterize England as a constitutional monarchy from 1650-1800. Their coding system makes use of a 150-year interval, however, reducing the precision of their estimates. Acemoglu, Johnson, and Robinson’s two measures classify it as 3 (slight to moderate limits on executive authority/some merchant rights) in 1600, 5 or 6 (substantial limits on executive authority/effective parliamentary representation) in 1700, 1750 and 1800, and 7 (executive subordination/government formed by middle class) in 1850. Jaggers and Marshall’s Polity IV yearly measure of executive constraints characterize England as 7 (executive subordination) from 1800-1913.
48 Even prior to fiscal centralization, contemporaries considered the Prussian tax system one of the most efficient in Europe. See Kiser and Schneider (1994).
50 Indeed, Jaggers and Marshall’s Polity IV yearly measure of executive constraints characterize Prussia as 1 or 2 (unlimited executive authority) from 1800-1805 and 1813-1858, 3 or 4 (slight to moderate limits on executive authority) from 1859-1866 and 1871-1908, and 5 (substantial limits on executive authority) from 1909-1913. Years 1806-1812 are considered as interruption periods and 1867-1870 as transition ones. For reasons described in section 2.4 of the text, I date the emergence of a limited regime in Prussia to 1848, however.
Germany as a whole rather than Prussia. However, my characterization of the rise of limited government corresponds reasonably well with their codes for political regimes and transitions there.\footnote{De Long and Shleifer’s three measures characterize Germany as absolutist from 1650-1800. Acemoglu, Johnson, and Robinson’s two measures classify it as 1 (unlimited executive authority/no effective capital protection) in 1600, 1700, 1750, 1800, and 1850.}

**Spain.** In the early 1700s, Bourbon reformers strengthened the power of the central government in Castile, imposing new taxes on Spain’s eastern provinces. Tax rates varied across regions, however, depending upon the particular bargain made. Thus, I view the Bourbon tax reforms as another example of tax particularism rather than fiscal centralization.\footnote{As Tortella (2000) writes, “Attempts to modernize public finance go back to the 18th century, with the plan for a single tax (contribución única) of the Marques de la Ensenada. But a century later things were even worse. Until 1845 the Spanish taxation system was a disorganized and unsystematic mosaic… (174).” For additional details, please see section 2.1 of the text.} Napoleon invaded Spain in 1808, attempting to convert it into a satellite state. The French did little to generate modern laws and administrative practices, however. Fiscal centralization did not occur until 1844 amidst a “moderate” decade of institutional reforms. From 1808 to 1876, civil unrest created political chaos in Spain. After decades of failed constitutional initiatives, a stable variant of constitutional monarchy was established in 1876, lasting until a military coup in 1923.\footnote{Carr (1966), Vicens Vive (1969), Lynch (1989), Tortella (2000), 27-32, 173-192, and Tortella and Comín (2001), 155-165.} My characterization of the rise of limited government in Spain also corresponds well with the ways in which De Long and Shleifer (1993), Acemoglu, Johnson, and Robinson (2005) and Jaggers and Marshall (2005) have coded political regimes and transitions there.\footnote{De Long and Shleifer’s three measures characterize Spain as absolutist from 1650-1800. Acemoglu, Johnson, and Robinson’s two measures classify it as 1 or 2 (unlimited executive authority/no effective capital protection) in 1600, 1700, 1750, and 1800 and 4 (slight to moderate limits on executive authority/some merchant rights) in 1850. The authors use 40-year averages around each date to compute values, however, reducing the precision of their point estimates. Jaggers and Marshall’s Polity IV yearly measure of executive constraints characterize Spain as 1 or 2 (unlimited executive authority) from 1800-1807, 1814-1819, 1823-1835, 1853-1867, and 1873, 3 or 4 (slight to moderate limits on executive authority) from 1820-1822 and 1846-1851, 5 (substantial limits on executive authority) from 1830-1852, and 7 (executive subordination) from 1837-1844, 1871-1872, and 1876-1913. Years 1808-1813 are considered as interruption periods and 1836, 1868-1870, and 1874-1875 as transition ones.}

For a list of 19th century Spanish revolutions, coups, and civil wars, please see appendix 3.
Appendix 2. Data Sources

Revenues figures concern income from taxation collected by central governments. Loan income has been subtracted whenever possible. Intermediate years for revenues and populations were linearly interpolated. For additional details, please see section 4 of the text.


The British official price of gold is given in pounds per fine ounce, 1650-1717, and the London market price of gold in pounds per fine ounce, 1718-1913, are taken from Officer (2006). With the exception of French Revolutionary and Napoleonic times, both series are nearly identical.


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55 These figures do not include Wales. See Wrigley and Schofield (1981), 10.
56 We must distinguish between institutional innovations in England itself and for Britain as a whole. To control for such differences, I use the population for the relevant political entities when calculating per-capita figures. As discussed in appendix 1, Acts of Union assimilated England with Wales in 1536, with Scotland in 1707, and with Ireland in 1800. From 1650-1691, revenues data for the English crown is used, since British data is unavailable. To convert into per-capita terms, I divide by only the English population. Due to data unavailability, neither Wales nor Scotland is included, though at the time the English crown collected revenues from both domains. By making the pre-1692 population denominator smaller than it actually was, both decisions bias against the hypotheses that limited government resulted in an increase in revenues. Revenues data are for Great Britain (i.e., England, Scotland, and Wales) from 1692-1801 and for the United Kingdom (i.e. Great Britain and Ireland) from 1802-1913. Accordingly, population figures are used for England, Scotland, and Wales from 1692-1801, and England, Scotland, Wales, and Ireland from 1802-1913.
57 British revenues in ounces of gold were transformed into revenues in grams of gold by multiplying by 28.35, since 1 ounce = 28.35 grams.
The Paris market price of gold in francs per gram, 1650-1913, is courtesy of Jean-Laurent Rosenthal.

The Netherlands. Due to data unavailability, public revenues for the Dutch Republic have been culled from Holland, 1719-1794. For additional details, please see section 5 of the text. REV1 is public revenue in Holland, 1668-1794, from Fritschy, Horlings, Liesker, and Van Der Ent (1995). REV2 is income of the Batavian Republic and its successors, 1803-1810, 1814, from Van Zanden and Van Riel (2004), 49. REV3 is income during the reign of Willem I, 1814, 1821, 1826, 1831, 1836, 1840, from Van Zanden and Van Riel (2004), 99. Years 1816-1830 include the Southern Netherlands (i.e. Belgium and Luxembourg), income shares of which may be found in Van Zanden (1996), 69. I have calculated total revenues for the Netherlands over this period by subtracting the percentage contribution of Southern provinces. REV4 is central government revenue, 1845-1913, from Mitchell (2003). The series of Dutch central government revenues from 1668-1913 consists of REV1: 1719-1794; REV2: 1803-1810; REV3: 1814-1840; REV4: 1845-1913. Years 1841-1844 have been interpolated.

POP1 is population of Holland courtesy of Jan Luiten van Zanden. POP2 is population of the Netherlands from De Vries (1984), 36. POP3 is population of the Netherlands from Mitchell (2003). The Dutch population series from 1650-1913 consists of POP1: 1650-1794; POP2: 1800; POP3: 1816, 1829, 1839, 1849, 1859, 1869, 1879, 1889, 1899, 1909. All other years have been interpolated. Consistent with the revenues figures, population numbers exclude the Southern Netherlands.

The Dutch market price of gold in guilders per gram, 1719-1913, is courtesy of W.L. Korthals Altes. Years 1749 and 1759 are missing.

Prussia. REV1 is net revenues, 1688-1806, from Korner (1995). For 1688-1713, revenues figures are derived from the military treasury only. REV2 is total ordinary revenues, 1807-1913, from Mauersberg (1988), 125. The series of Prussian central government revenues from 1688-1913 consists of REV1: 1688-1806; REV2: 1821, 1829, 1841, 1847, 1850, 1855, 1860, 1867, 1868, 1870, 1874, 1875, 1880, 1885, 1890, 1900, 1905, 1910. All other years have been interpolated.

POP1 is population of Prussia courtesy of Peter Brecke. Note that these figures incorporate Prussian territorial changes over the 17th to 19th centuries as best as possible. POP2 is population of Prussia from Mauersberg (1988), 127. The Prussian population series from 1650-1913 consists of POP1: 1688-1865; POP2: 1870, 1874, 1875, 1880, 1885, 1890, 1895, 1900, 1905, 1910. All other years have been linearly interpolated.

I have converted Prussian revenues into grams of gold from 1688-1913 as follows. Thaler units were first transformed into silver ones by multiplying by 16.667. I then transformed revenues from silver units to gold ones by dividing by the silver for gold price ratio found in Officer (2006). Lastly, I divided by the Prussian population to find per-capita revenues in grams of gold. Note that revenues were given in marks from 1857-1913, where one mark was worth one-third of a thaler following de Vanssay (1999). Hence, for this period I transformed mark units into thaler ones by dividing by 3 before proceeding through the steps just described.


58 In turn, I have divided by Holland’s population to compute per-capita revenues over this period.
59 Thanks to Giovanni Federico for alerting me to this conversion.
The Spanish population series from 1650-1913 consists of POP1: 1650, 1700, 1850; POP2: 1750, 1787; POP3: 1717, 1797; POP4: 1768, 1857, 1860, 1877, 1887, 1897, 1900, 1910, 1920. All other years have been interpolated.

The Spanish market price of gold or silver is not available over the 16th to 19th centuries because buying and selling bullion outside the Spanish mint was forbidden. Hence, I have converted Spanish revenues into grams of gold as follows. First, the pounds for pesos exchange rate was transformed into pounds for pesetas by multiplying by 5. Second, revenues in pesetas were transformed into revenues in pounds by dividing by this exchange rate. Third, revenues in pounds were transformed into revenues in grams of gold by dividing by the market price of gold in ounces. Fourth, revenues in ounces of gold were transformed into revenues in grams of gold by multiplying by 28.35, since 1 ounce = 28.35 grams. Lastly, I have divided by the Spanish population to find per-capita revenues in grams of gold.

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60 Thanks to Pilar Nogues for alerting me to this fact.
61 To do so, the London Pound for Madrid Peso (1698-1913) data set from the Global Financial Database (www.globalfinancialdata.com/index.php3) was employed. Since the Spanish revenues data is in pesetas, I had to make the following conversion: 1 peso = 20 reales and 1 peseta = 4 reales, meaning that 1 peso = 5 pesetas. See Vicens Vives (1969), 582-583, 713-715, and Tortella (2000), 158, for details on conversions involving pesos, reales, and pesetas.
Appendix 3. Regression Variables

For additional details, please see sections 6, 7, and 8 of the text.

Dependent variable 1 is the ratio of annual per-capita revenues to urbanization rates. Please see below for additional details about the urbanization variable.

Dependent variable 2 is the ratio of annual per-capita revenues to Maddison’s (2003) per-capita GDP figures. Please see below for additional details about the per-capita GDP variable.

The dummy variable for fragmented and absolutist political regimes takes a value of 1 for each year that a sample state possessed a fragmented and absolutist regime from 1650-1913. The dummy variable for centralized and absolutist political regimes takes a value of 1 for each year that a sample state possessed a centralized and absolutist regime from 1650-1913. The dummy variable for centralized and limited political regimes takes a value of 1 for each year that a sample state possessed a centralized and limited regime from 1650-1913.

The urbanization variable calculates the urban population as a percentage of the total population for each sample state annually. All urban population figures are from De Vries (1984). In particular, figures for 1650, 1700, 1750, and 1800 are from appendix 3, 305-337, and figures for 1850, 1890, and 1880 are from table 3.8, 44-47, for cities with populations of at least 10,000 inhabitants through 1850, with at least 20,000 inhabitants in 1890, and with at least 100,000 inhabitants in 1880. All intermediate years have been interpolated. With the possible exception of French Revolutionary and Napoleonic times (1789-1815), however, no major population shocks (e.g. plague) occurred over the period under consideration, suggesting that the figures are reasonable approximates of urbanization. For population sources, please appendix 2.

The per-capita GDP variable, taken from Maddison (2003), measures per-capita GDP in 1990 international Geary-Khamis dollars for sample states from 1650-1913. Data is available for 1600, 1700, and 1820-1913. All intermediate years have been interpolated.

In the literature on the classic gold standard era, there are discrepancies in adoption dates due to the use of different definitions. The gold variable dummy variable takes a value of 1 for each year that a state was on gold according to Meissner (2002), who takes a strict measure of gold adherence that selects the year in which a currency became de facto and de jure convertible into gold by law. Britain was the first country to go on a de facto gold standard in 1717. However, it was not until 1774 that silver's legal tender property was restricted and not until 1816 that the gold standard was formally adopted. In 1821, Britain returned to de facto gold convertibility. Many other states were legally bimetal, though effectively silver, through the 1840s. Of these, France was the most important: the bimetallic standard was established there in 1803. The Netherlands was also legally bimetal until 1849, when it formally switched to silver. German states such as Prussia were on a silver standard. In Spain, competing monetary systems coexisted until 1848, when bimetallism was legally established. The 1848 law was a failure, however, and another attempt was taken in 1868. Unlike most other European states, Spain was a “shadow” rather than official member of the gold standard. It suspended gold convertibility of Spanish banknotes in 1883, becoming one of the few remaining silver standard countries. Britain: gold, 1821-1913. France: gold, 1878-1913. Netherlands: gold, 1875-1913. Prussia/Germany: gold, 1872-1913. Spain: No gold standard from 1870-1913. For sources, see Redish (1995), 718, Flandreau (1996), 862, Jonker (1997), 95-98, Tortella (2000), 158-161, 202-205, Officer (2001), Meissner (2002), 7, and Morys (2006), 38-44.

62 Due to a dearth of data, I have used German urbanization and population figures for Prussia from 1750-1913.
63 Also see Hohenberg and Lees (1985) and Bairoch (1988).
64 As for the urbanization variable, a lack of data has led me to substitute Maddison’s (2003) German per-capita GDP figures for Prussia.
The war dummy variable takes a value of 1 for each year in which a sample state was engaged in a European military conflict from 1650-1913, according to Winks and Kaiser (2004) and the Encyclopedia Britannica (2007). First Anglo-Dutch War, 1652-1654 (Britain, Netherlands); Anglo-Spanish War, 1654-1660 (Britain, Spain); Second Anglo-Dutch War, 1665-1667 (Britain, Netherlands); War of Devolution, 1667-1668 (Britain, France, Netherlands, and Spain); Third Anglo-Dutch War, 1672-1674 (Britain, Netherlands); Franco-Dutch War, 1672-1678 (France, Netherlands, and Spain); War of the Reunions, 1683–1684 (France, Netherlands, and Spain); War of League of Augsburg, 1689-1697 (Britain, France, Netherlands, and Spain); Great Northern War, 1700-1721 (Prussia); War of the Spanish Succession, 1701-1714 (Britain, France, Netherlands, Prussia, and Spain); War of the Quadruple Alliance, 1718-1720 (Britain, France, Netherlands, and Spain); War of the Polish Succession, 1733-1738 (France, Prussia, and Spain); War of the Austrian Succession, 1740-1748 (Britain, France, Netherlands, Prussia, and Spain); Seven Years’ War, 1756-1763 (Britain, France, Prussia, and Spain); Fourth Anglo-Dutch War, 1780-1784 (Britain, Netherlands); War of the First Coalition, 1792-1797 (Britain, France, Netherlands, Prussia, and Spain); War of the Second Coalition, 1799-1802 and 1805-1807 (Britain, France, Netherlands, and Prussia); Peninsular War, 1808-1813 (Britain, France, Netherlands, Prussia, and Spain); Battle of Waterloo, 1815 (Britain, France, and Prussia); Belgian-Dutch War, 1831-1839 (Netherlands); First War of Schleswig, 1848-1851 (Prussia); Crimean War, 1854-1856 (Britain, France); Second War of Schleswig, 1864 (Prussia); Austro-Prussian War, 1866 (Prussia); Franco-Prussian War, 1870-1871 (France, Prussia). The Netherlands was ruled by France from 1795-1813, and so it has been counted in any war that France fought over this period.

The dummy variable for civil wars, coups, and revolutions takes a value of 1 for the year(s) during any civil war, coup, and revolution within sample states from 1650-1913, according to Winks and Kaiser (2004) and the Encyclopedia Britannica (2007). Britain: 3rd English Civil War, 1649-1651; Glorious Revolution of 1688. France: French Revolution, 1789-1799; Napoleonic coup of 1799; Restoration of 1815; July Revolution of 1830; Year of Revolution of 1848; French coup in 1851; Fall of 2nd empire in 1870. Netherlands: Batavian Revolution of 1785; Restoration of 1814-1815; Belgian Revolution of 1830; Year of Revolution of 1848. Prussia: Year of Revolution of 1848. Spain: Coup of 1820; Restoration of 1823; 1st Carlist War, 1833-1839; Moderate coup of 1843; Matiners (2nd Carlist) War, 1847-1849; Rebellion of 1854; Government collapse of 1863; Glorious Revolution, 1868-1870; 3rd Carlist War, 1872-1876 (encompassing the Restoration of 1874).

The country dummy variable takes a value of 1 to identify individual sample states.

The year dummy variable takes a value of 1 to identify individual years from 1750-1913.
References


Table 1. Timeline of Political Transformations for European States

<table>
<thead>
<tr>
<th></th>
<th>Fiscal Centralization</th>
<th>Limited Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britain</td>
<td>1066</td>
<td>1688</td>
</tr>
<tr>
<td>France</td>
<td>1790</td>
<td>1870</td>
</tr>
<tr>
<td>Netherlands*</td>
<td>1806</td>
<td>1848</td>
</tr>
<tr>
<td>Prussia</td>
<td>1806</td>
<td>1848</td>
</tr>
<tr>
<td>Spain</td>
<td>1844</td>
<td>1876</td>
</tr>
</tbody>
</table>

I define fiscal centralization to have occurred the year in which the state’s central government secured its revenues through a tax system with uniform rates throughout the country. Similarly, I define limited government to have emerged the year in which parliament gained the stable constitutional right to control the state’s annual budget. To meet my criteria, parliament’s power had to hold for at least two consecutive decades. For additional details, please see section 2 of the text and appendix 1.

*Data for the Dutch Republic (1584-1795) was culled from Holland, characterized by a centralized and limited political regime. For additional details, please see section 5 of the text and appendix 2.

Table 2. Public Finance Characteristics of Political Regimes

<table>
<thead>
<tr>
<th>Regime</th>
<th>Per-Capita Revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fragmented + Absolutist</td>
<td>Low due to local free-riding and lack of credible commitment</td>
</tr>
<tr>
<td>Centralized + Autocratic</td>
<td>Increase due to resolution of local free-riding but still no credible commitment</td>
</tr>
<tr>
<td>Centralized + Limited</td>
<td>High due to resolution of local free-riding and credible commitment</td>
</tr>
</tbody>
</table>

For additional details, please see section 3 of the text.

Table 3. Summary Statistics of Per-Capita Revenues Data

<table>
<thead>
<tr>
<th></th>
<th>Obs.</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Regimes</td>
<td>1121</td>
<td>8.63</td>
<td>7.57</td>
<td>0.26</td>
<td>42.04</td>
</tr>
<tr>
<td>Fragmented and Absolutist</td>
<td>378</td>
<td>2.40</td>
<td>1.39</td>
<td>0.26</td>
<td>6.27</td>
</tr>
<tr>
<td>Centralized and Absolutist</td>
<td>230</td>
<td>7.22</td>
<td>4.85</td>
<td>1.01</td>
<td>24.38</td>
</tr>
<tr>
<td>Centralized and Limited</td>
<td>513</td>
<td>13.86</td>
<td>7.51</td>
<td>2.36</td>
<td>42.04</td>
</tr>
</tbody>
</table>

For sources, please see appendix 2.
Table 4. Regression Results for Per-Capita Central Government Revenues

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per-Cap Revs / Urbanization Rate</td>
</tr>
<tr>
<td>Centralized and Absolutist Regimes</td>
<td>10.549**</td>
</tr>
<tr>
<td></td>
<td>(3.97)</td>
</tr>
<tr>
<td>Centralized and Limited Regimes</td>
<td>25.215**</td>
</tr>
<tr>
<td></td>
<td>(10.07)</td>
</tr>
<tr>
<td>Gold Standard</td>
<td>2.501</td>
</tr>
<tr>
<td></td>
<td>(0.91)</td>
</tr>
<tr>
<td>Warfare</td>
<td>8.459**</td>
</tr>
<tr>
<td></td>
<td>(2.68)</td>
</tr>
<tr>
<td>Civil Wars, Coups, Revolutions</td>
<td>- 5.681</td>
</tr>
<tr>
<td></td>
<td>(1.39)</td>
</tr>
<tr>
<td>Constant</td>
<td>- 0.862</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
</tr>
<tr>
<td>Country Fixed Effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>1121</td>
</tr>
<tr>
<td>R²</td>
<td>0.624</td>
</tr>
<tr>
<td>Wald χ²</td>
<td>13639.54</td>
</tr>
</tbody>
</table>

Z-statistics in absolute values are in parentheses. For additional details, please see sections 6, 7, and 8 of the text and appendix 3.

**Significant at 1 percent level, *Significant at 5 percent level
Table 5. Structural Breaks in Revenues-to-GDP Series by State

<table>
<thead>
<tr>
<th>Year</th>
<th>Sign</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1688</td>
<td>+</td>
<td>Limited government (1688)</td>
</tr>
<tr>
<td>1796</td>
<td>+</td>
<td>French and Revolutionary Wars (1792-1815)</td>
</tr>
<tr>
<td>1816</td>
<td>-</td>
<td>End of Napoleonic Era (1815)</td>
</tr>
<tr>
<td>1793</td>
<td>+</td>
<td>Fiscal centralization (1790) / French and Revolutionary Wars (1792-1815)</td>
</tr>
<tr>
<td>1818</td>
<td>+</td>
<td>End of Napoleonic Era (1815)</td>
</tr>
<tr>
<td>1869</td>
<td>+</td>
<td>Limited government (1870)</td>
</tr>
<tr>
<td>1745</td>
<td>+</td>
<td>War of the Austrian Succession (1740-1748) / Reinstatement of Stadtholder (1748)</td>
</tr>
<tr>
<td>1830</td>
<td>+</td>
<td>Belgian Revolt (1830) / Belgian-Dutch War (1831-1839)</td>
</tr>
<tr>
<td>1850</td>
<td>+</td>
<td>Limited government (1848)</td>
</tr>
<tr>
<td>1713</td>
<td>+</td>
<td>Great Northern War (1700-1721) / War of the Spanish Succession (1701-1714)</td>
</tr>
<tr>
<td>1773</td>
<td>-</td>
<td>End of Seven Years’ War (1756-1763)</td>
</tr>
<tr>
<td>1813</td>
<td>+</td>
<td>Fiscal centralization (1806) / French and Revolutionary Wars (1792-1815)</td>
</tr>
<tr>
<td>1847</td>
<td>+</td>
<td>Limited government (1848)</td>
</tr>
<tr>
<td>1846</td>
<td>+</td>
<td>Fiscal centralization (1844)</td>
</tr>
<tr>
<td>1866</td>
<td>+</td>
<td>Limited government (1876)</td>
</tr>
</tbody>
</table>

The “Sign” column indicates whether the difference in mean per-capita revenues-to-GDP ratios is positive or negative over the 20 years following the structural break in question as compared to the 20 years preceding it. For additional details, please see section 9 of the text.
Figure 1.

Yearly Per-Capita Revenues, France, 1650-1913

Figure 2.

Yearly Per-Capita Revenues, Netherlands, 1719-1913*

*Data for the Dutch Republic (1584-1795) was culled from Holland, characterized by a centralized and limited political regime. For additional details, please see section 5 of the text and appendix 2.
Figure 3.

Yearly Per-Capita Revenues, Britain, 1650-1750

Centralized + Absolutist

Centralized + Limited

Per-Capita Revenues (grams of gold)