THE POLITICAL ECONOMY OF FISCAL PRUDENCE IN HISTORICAL PERSPECTIVE

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This paper uses a new panel data set to perform a statistical analysis of political regimes and financial rectitude over the long run. Old Regime polities in Europe typically suffered from fiscal fragmentation and absolutist rule. By the start of World War I, however, many such countries had centralized institutions and limited government. Panel regressions indicate that political transformations towards centralized and limited regimes led to significant improvements in fiscal prudence. Dynamic estimations and structural breaks tests reinforce these findings. The results suggest that good financial housekeeping is one mechanism through which political reforms reduce sovereign credit risk.

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1. INTRODUCTION

There is a natural link between optimal macroeconomic policy and political commitment. To minimize supply-side disincentives caused by sudden changes in taxation, governments should finance large temporary increases in spending such as wars with loans funded by peacetime surpluses.[1] Governments that break promises to execute fiscal plans in time-consistent ways face risk premiums that raise the costs of deficit finance.[2] In a seminal paper, North and Weingast (1989) argue that the Glorious Revolution of 1688 enabled the English monarch to make a credible pledge to pursue responsible fiscal policies.[3] Most important, parliament gained a regular constitutional right to monitor how the ruler spent tax revenues. There is now a large literature that investigates the relationship between executive discretion and economic outcomes.[4]

Acemolgu (2005), however, notes that recent growth experiences such as those of the Asian Tigers took place under regimes with strong executives. He identifies a "weak state" problem that occurs when states do not have the fiscal capacity to play a developmental role.[5] In a historical context, Epstein (2000) argues that institutional fragmentation within European polities, and not fiscal abuse by rulers, was the principal cause of fiscal distortions.[6] Prior to the 1800s, there was a close relationship between local tax control and political autonomy. Elites thus had strong incentives to oppose structural reforms that threatened traditional rights. The result was a classic public goods problem, since each locality wished to free ride on the tax contributions of others. Dincecco (2009a) finds that per capita revenues collected by fragmented sovereignties were low. A lack of resources made it difficult for national governments to accumulate

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[1] See Barro (1979, 1987, 1989), Mankiw (1989), and Aiyagari et al. (2002).

[2] See Kydland and Prescott (1977) and Lucas and Stokey (1983).

[3] Also see Dickson (1967). Scholars disagree over the impact of the Glorious Revolution on public finances. O'Brien (2001) argues that England implemented key constitutional and administrative changes in the 1640s while Drelichman and Voth (2008) claim that fiscal repression, and not political reforms, allowed the government to sustain large debts.

[4] For theoretical statements, see Brennan and Buchanan (1980), North (1981), Levi (1988), Alesina and Perotti (1995), and McGuire and Olson (1996). For empirical studies, see De Long and Shleifer (1993), Knack and Keefer (1995), and Acemoglu et al. (2001, 2002, 2005). Many historical works use the concept of credible commitment to explain macroeconomic differences between eighteenth-century rivals Britain and France. These include Mathias and O'Brien (1976), Weir (1989), Hoffman and Norberg (1994), Rosenthal (1998), O'Brien (2001), and White (2001).

[5] Also see Migdal (1988), Wade (1990), Herbst (2000), Bates (2001), and Acemoglu et al. (2004).

[6] Several of the historical works cited in Footnote 4 also discuss fragmentation. See Hoffman and Rosenthal (1997a, 1997b) as well.

peacetime surpluses and follow tax-smoothing policies. Centralized from medieval times, England – the example par excellence that North and Weingast offer – was exceptional.[7]

To evaluate the relationship between political regimes and macroeconomic policies over the long run, it would be ideal to build upon the foundation set by Barro (1987), who examines the effects of changes in public spending on interest rates, the money supply, price levels, and budget deficits in the United Kingdom from 1701 to 1918. As Barro himself notes, however, the British data present an unmatched opportunity. Though White (1989, 1995), Bordo and White (1991), Velde and Weir (1992), and Sargent and Velde (1995) also perform detailed macro-historical investigations, they are limited to specific countries (Britain and/or France) and particular periods (the French Revolution and/or Napoleonic Wars).

Systematic analysis within and across European polities not only complements existing case studies, but sheds new light on the debate over the relative importance of "strong" versus "weak" governments in the process of economic development. Study of fiscal evolution in Europe is also valuable because countries around the world use – with varying degrees of success – its forms of fiscal governance (see La Porta et al. 2008). The period that I consider (1650 to 1913) captures a clear pattern of political transformations as European countries moved from fragmented and absolutist regimes to centralized and limited ones. The results suggest that both fiscal centralization and limited government led to significant improvements in fiscal policy.

Our variable of interest be viable given the dearth of recorded fiscal data prior to the 1870s (see Ferguson 2006). It should also provide a succinct measure of financial rectitude that is comparable across countries. Budgetary figures are one unique source of data that satisfy both conditions. According to Ferguson and Schularick (2006), the main problem for contemporaries was how to make accurate comparisons of fundamental resources between polities, or more simply put, how to calculate the denominator of economic ratios. Population was considered an unreliable indicator of economic performance, and direct measures of national production were still in their infancy. Current reconstructions of historic GDP levels, moreover, resemble educated guesses at best, particularly before the 1820s (see Acemoglu et al. 2005). Finally, data limitations preclude the use of export earnings or wage series as deflators.

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[7] See Brewer (1989).

To scale estimates across time, sophisticated analyses of government finances typically employed public revenues. Cain and Hopkins (1994) argue that budget deficit-to-revenue ratios were the method most preferred by investors to evaluate macroeconomic policies.[8] In accordance with the "gentlemanly capitalists" of London, I claim that the variable is an effective summary statistic of fiscal prudence. Low deficit ratios over time are interpreted as signs of good financial housekeeping and high ones as signs of poor financial housekeeping, ceteris paribus.

I first construct a new panel data set on public expenditures for eleven European countries. Long annual data series over a variety of political regimes characterize Group 1, which includes the largest and/or most important players in Europe at the time: Austria-Hungary, England, France, the Netherlands, Prussia, and Spain. The second group (Belgium, Denmark, Italy, Portugal, and Sweden) has shorter data series. To compute deficit ratios, I incorporate a sister panel data set on public revenues from Dincecco (2009a). Political regimes are also classified according to that work. Fiscal centralization generally occurred from 1789 onwards. Limited government usually took place decades after centralization during the 1800s.

The statistical analysis has three parts. OLS regressions with panel-corrected standard errors (PCSE) incorporate a relevant set of control variables (i.e. violent conflict, economic growth, fiscal and monetary policy, and country and period fixed effects) to assess the impact of political regimes on budget deficit-to-revenue ratios. I supplement the benchmark regressions with two alternative methods: dynamic pooled mean group (PMG) regressions and structural breaks tests. Political transformations were largely exogenous to budget deficit-to-revenue ratios. Fiscal centralization was often the result of French conquest and/or large-scale administrative reforms that established new state bureaucracies. Limited government typically happened in the midst of widespread economic, political, and social upheaval.[9] The PMG model, however, helps to mitigate any endogeneity that may remain. Though the political transformations correspond with exogenously given historical events, they are also "endogenous" in the sense that I use Dincecco's dates to mark regimes as centralized and/or limited. Structural breaks tests assume no a priori knowledge of major turning points but let the data "speak" for themselves.

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[8] Chapters 4 and 7. Also see Davis and Huttenback (1987) and Flandreau and Zumer (2004).
[9] For instance, Berger and Spoerer's (2001) quantitative analysis of 27 countries finds that severe grain shocks from 1845-1848, and not the presence of absolutist political regimes, triggered the 1848 revolutions in Europe.

The statistical inquiry supports the argument that political transformations towards centralized and limited regimes were associated with significant reductions in deficit ratios, that is, with improvements in financial rectitude. With the exception of Dincecco (2009a), who finds that political transformations led to gains in sovereign credit risk by enabling governments to raise greater tax amounts, the existing literature often overlooks the direct impact of political changes on public finances.[10] Thus, the analysis of government outflows with respect to inflows as performed here reveals a novel mechanism through which political reforms influence credit risk.

The rest of the paper proceeds as follows. The next section examines the relationship between political regimes and financial rectitude while the one that follows describes the data and sample countries. After examining the French and Dutch cases, I discuss the statistical framework and present the statistical results. The paper concludes with some lessons from history.

2. POLITICAL REGIMES AND FISCAL PRUDENCE

Figure 1, which plots annual budget deficit-to-revenue ratios in England (Britain) from 1692 to 1913, resembles a Barro (1979) tax-smoothing simulation.[11] Hoffman and Rosenthal (1997a) argue that the one true goal of early modern kings was to wage war for royal glory and/or homeland defense. The effect of military conflict on English public finances cannot be overstated. Deficit ratios increased during the War of the Grand Alliance (1688-1697), the War of the Spanish Succession (1701-1714), the War of the Austrian Succession (1740-1748), the Seven Years' War (1756-1763), the War of American Independence (1775-1783), and the French Revolutionary and Napoleonic Wars (1789-1815), but always fell with conflict's end. In peacetime, the government generated small but sufficient surpluses. The amount of wars decreased during the nineteenth-century era of British preeminence known as Pax Britannica. Though deficit ratios rose as expected with the Crimean (1853-1856) and Boer (1899-1902) Wars, budget balance was otherwise the norm during this period of relative peace.

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[10] See Frey and Kucher (2000), Sussman and Yafeh (2000, 2006), Quinn (2001), Stasavage (2003, 2005), Summerhill (2004), and Dincecco (2009b).

[11] As noted by Sargent and Velde (1995). Acts of Union assimilated England with Wales in 1536, with Scotland in 1707, and with Ireland in 1800. Data are for England from 1650-1687, Great Britain (i.e. England, Scotland, and Wales) from 1692-1801, and the United Kingdom (i.e. Great Britain and Ireland) from 1802-1913. For consistency, I refer to this data series as "English" throughout the text. Appendix A describes the relevant data sources.

Notwithstanding periods of military conflict, average English deficit ratios remained low from 1692 to 1913. Yet England possessed a centralized fiscal structure by medieval times and an effective parliament by 1688. What if there had been fragmented and/or absolutist institutions instead? To examine the relationship between political arrangements and macroeconomic policies, I first classify political regimes according to Dincecco (2009a).

2.1 Fiscal Centralization

Though fiscal centralization in Europe was a centuries-long process, it remained largely unfinished through most of the 1700s. Profound changes often came with the French Revolution and Napoleon. In many places, therefore, centralization is identifiable as a structural shift that occurred from 1789 to 1815 (also see Acemoglu et al. 2008).

Dincecco, who uses a simple definition to make comparisons across polities possible, argues that national governments completed the process of fiscal centralization the year in which they began to secure revenues by way of a tax system with uniform rates throughout the country. This change typically occurred in the context of large-scale administrative reforms that established new state bureaucracies. Though levels of fragmentation varied across countries, Dincecco classifies all pre-centralized regimes as completely fragmented, even for polities where fragmentation was relatively low. In turn, the statistical results will be more robust if they still indicate that centralized regimes were associated with significantly smaller deficit ratios than fragmented ones.

Table 1 indicates that fiscal centralization took place swiftly and permanently throughout much of the Continent from 1789 onwards. The National Assembly transformed the tax system in France by eliminating traditional exemptions and privileges. Napoleon completed this process after his coup in 1799. French conquest of Belgium, the Dutch Republic, and various Italian polities led to major administrative changes. After defeat in battle by France in 1806, Prussia also made significant fiscal reforms.

Some exceptions bear mention. At one extreme, England possessed centralized institutions long before most Continental regimes. At the other, the French failed in their attempts to make structural changes on the Iberian Peninsula: fiscal centralization in Portugal and Spain did not happen until 1832 and 1844,

respectively. The same is true for Austria-Hungary, where centralization occurred with the Revolutions of 1848.

2.2 Limited Government

Since budget authority increased over time, a reasonable depiction of limited government must not only capture parliament's real power to act, but should also be simple enough to apply to all sample countries. Dincecco argues that limited government emerged the year in which parliament gained the stable constitutional right to control the national budget on an annual basis. For stability, parliament's power of the purse had to hold for at least two consecutive decades. To ensure that dating was as objective as possible, Dincecco selected years and regimes for which there was widespread consensus. His coding scheme corresponds closely with the classification systems employed by Tilly (1990), De Long and Shleifer (1993), Acemoglu et al. (2005), and Jaggers and Marshall's (2008) Polity IV project.[12] The use of these three criteria – a regular veto right by parliament over budgets, regime stability, and scholarly agreement – means that political arrangements were categorized as limited in a way that parallels North and Weingast's (1989) original description of constitutional reform in England.

Though limited government was occasionally shaky during the 1800s, Dincecco's definition sets a minimum threshold for stability by requiring that parliamentary rights held for at least 20 straight years. I allowed for citizen doubts about whether executives would renege on their parliamentary commitments – and hence uncertainty over how long new limited regimes would last – by including five-year or ten-year lags on their start dates as a robustness check.[13] Dincecco, moreover, always favors early dates to define political regimes as limited. Since deficit ratios typically fell from 1650 to 1913, average deficits associated with limited government will thus be higher than otherwise. In turn, the statistical results will be stronger if they still show that limited regimes were associated with significantly lower deficit ratios than absolutist ones.

[12] None of those schemes, however, fit the particular demands of this study. Whereas De Long and Shleifer code regimes at 150-year intervals, Acemoglu et al. classify them at 100-year (1000-1700) or 50-year (1700-1850) ones. Moreover, Acemoglu et al. use 40-year windows around each date, which reduces the precision of individual point estimates. Though Jaggers and Marshall do in fact code executive constraints for countries at yearly intervals, their data set does not begin until the nineteenth century.
[13] A related issue is "borderline" political regimes. Though the July Regime (1830-1847) in France was constitutional, it lasted for less than two decades. Classification of this regime as centralized and limited rather than centralized and absolutist, however, did not significantly affect the findings. A second instance was the short-lived constitutional regime in Denmark (1848-1865). However, the Danish deficit ratio series did not begin until 1873.

Table 2 indicates that limited government reforms began several decades after centralization during the 1830s and 1840s. A second wave of limited reforms occurred in the 1860s and 1870s. England, which implemented executive constraints on spending nearly 150 years earlier, was precocious. At the other extreme, Denmark did not establish a stable constitutional monarchy before World War I.

2.3 Theoretical Implications

Limited government established parliament's power of the purse, which reduced the likelihood of poor spending decisions by executives. Ceteris paribus, it should have improved financial rectitude, as expressed by a decrease in average deficit-to-revenue ratios, relative to absolutist regimes. The relationship between fiscal centralization and prudence is less straightforward. On one hand, centralization generated a significant increase in per capita revenues, which made it easier for crowns to follow sound fiscal policies. Thus, average deficit ratios should have fallen. On the other hand, the consolidation of fiscal powers by monarchs may have aggravated problems of executive control. There was always the danger that executives would waste new revenues on ill-advised wars. If so, then average deficit ratios should have increased after centralization.

Table 3 provides a summary of the deficit ratio characteristics of the four possible political regimes: fragmented and absolutist, centralized and absolutist, fragmented and limited, and centralized and limited. Note that there was only one example of the fragmented and limited regime among sample countries.[14] Ceteris paribus, average deficit ratios under centralized and limited regimes should have been lower than under fragmented and absolutist ones. Fiscal centralization implied an increase in public funds because it eliminated local free riding. Similarly, limited government established spending constraints on executives. The combination of greater revenues and parliamentary control should have improved financial housekeeping.

By the same logic, average deficit ratios should have decreased under fragmented and limited regimes in comparison with fragmented and absolutist ones. Theory cannot predict whether there was an improvement in fiscal prudence under centralized and absolutist regimes in comparison with fragmented and absolutist ones, since fiscal centralization generated additional funds that executives may have spent

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[14] This was the Dutch Republic (1572-1795), which I discuss in Section 4.

recklessly or used to balance budgets. However, we may say that average deficit ratios under centralized and limited regimes should have been lowest of all, as both sorts of fiscal problems had been resolved.

3. DATA AND SAMPLE COUNTRIES

I constructed a database on annual expenditures from many secondary sources. Chief among them were Bonney's *European State Finance Database* (ESFDB) for the seventeenth and eighteenth centuries and Mitchell's (2003) *International Historical Statistics* (IHS) for the nineteenth and early twentieth ones. Appendix A documents the data sources and construction methods for each sample country.

Bonney (1995a, 1999) discusses the limitations of the historical data. European countries did not maintain detailed financial records during the seventeenth and eighteenth centuries. I calculated expenditures as total spending by national governments including debt service. Loan amounts were incorporated whenever possible. Since linkages between tax bases and expenditures were uncertain, particularly during times of war, I did not interpolate observations for missing years. The expenditure data also came in different currencies. To make calculations comparable across countries, I transformed all units into grams of gold. A sister panel data set on public revenues from Dincecco (2009a) was incorporated to compute budget deficit-to-revenue ratios. To determine total revenues, Dincecco added ordinary and extraordinary figures together and subtracted loan income.

I divided the sample into two groups based on data availability and historical importance. Annual published series of nearly two centuries or more for deficit ratios as well as for a variety of controls typically existed for the six polities (Austria-Hungary, England, France, the Netherlands, Prussia, and Spain) that comprised the first group. Not only were these countries among the largest and/or most powerful players in Western Europe at the time, but for them data were available over a variety of political regimes.

Shorter published time series existed for the five countries (Belgium, Denmark, Italy, Portugal, and Sweden) in the second group. Budget data for Belgium and Italy only began after they were founded as constitutional monarchies in 1831 and 1861, respectively. Annual series for Portugal and Sweden did not start until after the establishment of centralized and limited regimes during the 1800s.[15] Since Denmark did

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[15] The Portuguese expenditure series became available in 1852 and the Swedish one in 1881. Though the ESFDB lists Swedish revenue data from 1722-1809, there were no corresponding expenditure series available.

not achieve a stable form of limited government by 1913, it functioned as an additional "absolutist" control in the regressions.[16] Though data prior to political transformations were not available for the second set of countries, their inclusion enriched the sample by expanding the range of institutional experiences.

4. CASE STUDIES

Before moving on to the statistical analysis, it is worthwhile to study France and the Netherlands, two sample polities for which long runs of data are available. Figure 2 plots annual French budget deficit-to-revenue ratios over political regimes from 1650 to 1913. Unlike England, France did not appear to follow an effective tax-smoothing program before 1800.[17] French deficit ratios during the War of the Spanish Succession (1701-1714) were considerably less than English ones. Moreover, France did not run deficits during the War of the Grand Alliance (1689-1697) or the War of the Austrian Succession (1740-1748).

Differences in political arrangements help explain this divergence in macroeconomic policies. Whereas England was centralized and limited from 1688 onwards, France remained fragmented and absolutist through the French Revolution (1789-1799). Figure 2 suggests that French deficit ratios decreased with political transformations. Ratios associated with the fragmented and absolutist regime were large and volatile: in the 1650s, they came close to three grams of gold. Both the magnitudes and variances of deficit ratios became smaller in the decades that followed fiscal centralization (1790), even during the Napoleonic Wars (1799-1815).[18] After Napoleon's final defeat in 1815, the Bourbon monarchy was restored. The next several years saw intense battles between royal and liberal forces. The July Revolution of 1830 established a short-lived constitutional regime (1830-1847). There was a small increase in deficit ratios near the Revolutions of 1848 and subsequent coup by Napoleon III in 1851, who reigned as emperor through the

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[16] The ESFDB database lists expenditures for Denmark from 1710-1806, but there were no such series available from 1807-1853.

[17] As noted by Sargent and Velde (1995). Some eighteenth-century data were missing. If the French government did not publish budgets during periods of political instability, when public finances typically suffered, then average deficit ratios associated with the fragmented and absolutist regime would likely appear smaller than otherwise. In turn, the analysis would bias against the hypotheses that fiscal centralization and limited government led to improvements in financial rectitude.

[18] Bordo and White (1991) claim that the Revolution's use of confiscation, capital levies, and an inflation tax cost France its reputation to repay debts. They argue that large-scale tax reforms such as centralization enabled Napoleon to gather enough in new revenues to fund military efforts without resorting to major borrowing.

1860s. Budget balance became the norm with the establishment of a stable centralized and limited regime in 1870.

In contrast to France, the Dutch case suggests that fiscal centralization exacerbated problems of absolute control. Figure 3 plots annual budget deficit-to-revenue ratios over political regimes in the Netherlands from 1720 to 1913. I follow Dincecco's (2009a) classification of the Dutch Republic (1572-1795) as fragmented and limited. Deficit ratios in the Republic remained small and stable through the 1770s, though they did increase with the War of the Austrian Succession (1740-1748). Ratios rose during the 1780s due to mounting financial woes. In 1795, France conquered the Republic.

The Kingdom of the United Netherlands, established at the end of the Napoleonic era, granted absolutist powers to the new king, Willem I. Parliamentary budget authority, which came at 10-year intervals, was ineffective. Spending heavily on the military, on infrastructure, and on the monarchy itself, Willem was unable to balance the national accounts, though fiscal centralization in 1806 had roughly doubled the size of the Dutch tax base and Europe was politically stable. The rapid growth in deficits from 1815 onwards reflected the reckless policies that the king pursued.[19] Willem also used semi-legal means to hide the true state of public finances. When Dutch fiscal troubles finally became public in 1839, parliament vetoed the upcoming decadal budget. Deficit ratios remained high through Willem's abdication in 1840. After the Revolutions of 1848, which saw the establishment of a centralized and limited regime in the Netherlands, they gradually fell to near-zero levels.

To supplement the case studies, it is useful to survey the rest of the data. Figures 4 through 6 plot annual budget deficit-to-revenue ratios over political regimes for the other Group 1 countries. Spain (figure 4) resembles France, as both the magnitudes and variances of deficit ratios became smaller in the decades that followed fiscal centralization (1844) and limited government (1876). Austria-Hungary (figure 5), however, appears similar to the Netherlands, since deficit ratios rose with fiscal centralization (1848) but fell in the decades after limited government (1867).

Surprisingly, Prussia (figure 6) remained in the black over the tumultuous 1700s, even for major conflicts such as the Great Northern War (1700-1721), the War of the Austrian Succession (1740-1748), and

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[19] Also see Van Zanden and Van Riel (2004). In this regard, Willem resembled pre-1688 English monarchs such as Charles I (1625-1649). See North and Weingast (1989). The loss of tax revenues from Belgium, which declared independence in 1831, also aggravated deficits. See Fritschy et al. (2003).

the Seven Years' War (1756-1763). Prussian deficit ratios prior to 1800 may have reflected unusual fiscal discipline: Kiser and Schneider (1994) claim that the tax system in Prussia was one of the most well run in Europe at the time. Nevertheless, the Prussian government made significant reforms including centralization after defeat by France in the Battle of Jena-Auerstedt in 1806. This episode suggests that Prussia was aware of the need for administrative changes.

Data limitations meant that Prussian observations over the 1800s were few. Qualitative accounts, however, suggest a positive relationship between limited government and public finances in Prussia. According to Ferguson (1998), Rothschild lenders urged King Frederick William II (1786-1797) to implement constitutional reforms as a credible way to improve sovereign credit risk. Tilly (1966, 1967), moreover, argues that the constitutional reforms of 1848 strengthened the ability of the Prussian parliament to follow sound fiscal policies. Finally, the quantitative analysis by Dincecco (2009a) finds that limited government in Prussia led to a significant increase in per capita public revenues.[20]

Table 4 displays the summary statistics for the deficit ratio panel. In total, there are 1,284 observations, 310 for fragmented and absolutist regimes, 237 for centralized and absolutist ones, and 662 for centralized and limited ones. 75 observations characterize the lone fragmented and limited regime. The data, which show that average deficit ratios for centralized and absolutist regimes (0.26) were larger than those of fragmented and absolutist ones (0.18), suggest that centralization exacerbated deficit ratios. Average ratios for centralized and limited regimes, however, were smaller (0.16) than those for fragmented and absolutist ones. Average ratios for the fragmented and limited regime (0.19) did not differ notably from those of those of fragmented and absolutist ones.[21]

Though the Group 1 evidence suggests that political transformations influenced public finances, it is not definitive. Figure 7, which plots annual budget deficit-to-revenue ratios for Group 2 countries from 1820 to 1913, highlights the importance of controls for factors besides political regimes. By the 1870s, for instance, it is difficult to distinguish between deficit ratios associated with the absolutist regime in Denmark

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[20] See Tilly et al. (1975) and Berger and Spoerer (2001) as well. Jaggers and Marshall (2008) characterize nineteenth-century Prussia along absolutist lines, even after 1848. As discussed in Section 2, the choice of early dates to define political regimes as limited typically biased against the hypothesis that executive constraints improved public finances. For robustness, I also classified the post-1848 regime in Prussia as centralized and absolutist rather than centralization and limited. The results were not significantly affected.

[21] Among Group 1 countries there are 1,016 observations, 310 for fragmented and absolutist regimes (average deficit ratios = 0.18), 196 for centralized and absolutist ones (0.29), 435 for centralized and limited ones (0.16), and 75 observations for the fragmented and limited regime (0.19).

and those associated with limited regimes elsewhere. To account for the effects of violent conflict, economic

growth, fiscal and monetary policy, and other elements, I now turn to a more rigorous quantitative analysis.

5. STATISTICAL TESTS

5.1 PCSE Regressions

Estimations of panel data increase informative content by combining variations across time and

country. I followed Beck and Katz (1995) and employed ordinary least squares with "panel-corrected"

standard errors (PCSE), which corrects for contemporaneously correlated errors and panel heteroskedasticity.

The basic fixed effects specification is:

$$\text{Def}_{i,t} = \beta_0 + \beta_1 \text{ CA regime}_{i,t} + \beta_2 \text{ FL regime}_{i,t} + \beta_3 \text{ CL regime}_{i,t} + \gamma \text{ X}_{i,t} + \mu_i + \varepsilon_{i,t} \quad (1)$$

where $\text{Def}_{i,t}$ is the budget deficit-to-revenue ratio for country i in year t, $\text{X}_{i,t}$ is a vector of control variables to

be described, μ_i represent country-specific fixed effects, and $\varepsilon_{i,t}$ is the disturbance term. I used dummy

variables for centralized and absolutist (CA), fragmented and limited (FL), and centralized and limited (CL)

regimes relative to fragmented and absolutist ones as a clear and simple method to measure the impact of

political arrangements on fiscal prudence.

The effect of military conflict on public finances was fundamental. Hoffman and Rosenthal (1997a)

argue that military expenses dominated early modern state budgets.[22] In the 1800s, Ferguson (2006) claims

that political events were more important to investors than economic ones, because there was a greater

amount of regular information available about them. Sussman and Yafeh (2000, 2006) also find that investors

responded quickly to civil unrest and wars in eighteenth-century Britain and Meiji-era Japan. Optimal policy

suggests that deficit ratios increased during conflicts as governments spent greater amounts but fell shortly

afterwards. The previous authors claim that the total effect of warfare on public finances was negative due to

the destruction that it caused. Kindleberger (1984), Tilly (1990), Hoffman and Norberg (1994), Epstein

(2000), O'Brien (2001), and Rosenthal and Wong (2007), however, argue that military competition fostered

financial innovations that allowed governments to raise and spend larger sums over the long term. Whether a

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[22] Military expenditures were also sizeable during the nineteenth century. Lindert (2004) shows that there was little spending on social programs of any kind before the 1900s.

country won or lost a conflict also influenced deficit ratios. So long as the defeated country took more casualties, then the reduction in its tax base would have been more severe.

Conflicts differed by characteristics such as the scope of the war and the strength of the enemy. To help evaluate the impact of warfare on public revenues, I used the data set based on Clodfelter (2002) and assembled by Dincecco (2009a). Dincecco includes all conflicts fought at least in part in Western Europe (as well as those fought at least in part in Eastern Europe so long as they involved at least one sample country) from 1650 to 1913. To gauge the destruction of war, Dincecco calculates average military deaths per conflict year. In certain years, sample countries were involved in two or more wars. Average deaths were summed over conflicts in such cases.

As described, the core purpose of Old Regime monarchs was to fight. I thus take as a basic premise the notion that rulers nearly always wished to go to battle. However, we should not neglect the potential role of financial conditions. A key factor in the decision to enter combat was an opponent's fiscal might. Military spending was by far the largest component of national budgets through the 1800s. Though total enemy expenditures would be an ideal measure of financial strength, this approach suffers from endogeneity. For instance, we may envision a scenario in which countries spent large peacetime amounts on standing armies in order to discourage adversaries from attack. Conceivably, peacetime deficit ratios influenced how much governments were willing to spend. One simple proxy for enemy strength that circumvents the endogeneity problem is coalition populations. As for average military deaths, I made use of the figures from Dincecco, who computes total coalition populations as the sums of available populations of coalition sample countries in the years that conflicts began. Coalition totals were summed for years in which sample countries were involved in two or more wars.

Financial factors may have influenced the make-up of wartime coalitions as well. Tilly (1990) posits England, the Dutch Republic (i.e. the Netherlands prior to 1795), and France as the major powers in Europe over the seventeenth to nineteenth centuries. Other countries, however, were potentially available for hire as mercenaries. To account for such activity, I constructed a dummy variable that took a value of one for each

year that a polity fought as part of an alliance with England, the Dutch Republic, and/or France from 1650 to 1913.[23]

Financial conditions may have also affected post-war outcomes. Though debt figures would be useful to measure the effects of warfare on public finances, continuous series were not available. There was, however, systematic information for debt default, an extreme reaction to fiscal crisis that caused widespread damage to the financial sector as well as to the economy as a whole.[24] Early modern executives often resorted to default as a way to handle large debt burdens accumulated during wars (see Hoffman and Rosenthal 1997a). To measure this effect, I included a dummy variable that identified all defaults on publicly held debts from 1650 to 1913 according to Reinhart et al. (2003).[25]

Internal conflict caused disruptions that reduced revenue flows. Hence, we must consider the impact of domestic turmoil as well. To measure this effect, I introduced a dummy variable that identified all civil wars, coups, and revolutions that occurred within sample countries from 1650 to 1913 from Dincecco (2009a).

One may also suppose that economic growth increased tax bases and enabled national governments to collect (and potentially spend) larger revenues. Since reliable GDP figures are difficult to come by before 1820, many studies of the late nineteenth century employ measures of foreign trade as approximates of national output (Mauro et al. 2002, Obstfeld and Taylor 2003, and Ferguson and Schularick 2006). However, systematic trade deficit and export series from the 1600s onwards were not available. Hohenberg and Lees (1985), Bairoch (1988), and Acemoglu et al. (2002, 2005) argue that there was a close relationship between urbanization rates and income growth. To proxy for per capita GDP, I added a yearly variable that calculated urban populations as fractions of total populations for each country from Dincecco (2009a).[26] Controls for

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[23] The Netherlands was classified as a potential mercenary rather than as a major power after French conquest in 1795.

[24] Currency debasement was another form of government "misbehavior," but systematic data across sample countries was not found.

[25] This source was supplemented with Jones (1994), 94, for England; Sargent and Velde (1995), 480, for France; Fritschy and Van Der Woort (1997), 65, for the Netherlands; Ferguson and Schularick (2007) for Belgium, Denmark, and Sweden; and Federico (2008) for Italy. Default years were Austria-Hungary, 1802, 1805, 1811, 1816, 1868; England, 1672; France, 1661, 1701, 1715, 1759, 1770, 1788, 1797; the Netherlands, 1810; Prussia, 1683, 1807, 1813; Spain, 1820, 1831, 1834, 1851, 1867, 1872, 1882; and Portugal, 1837, 1841, 1845, 1852, 1890. Belgium, Denmark, Italy and Sweden did not default in any year over the nineteenth century for which data existed.

[26] Use of per capita GDP figures from Maddison (2003) rather than urbanization rates did not significantly affect the findings.

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national income also help account for different rates of technological innovation and adoption across countries (Mokyr 1998, 1999).

As described, debt default was one important aspect of (wartime) fiscal policy for which systematic information was available. We may wish to account for monetary policy as well. One influential strand of the literature claims that adherence to the classic gold standard was a valuable signal of financial integrity (see Bordo and Rockoff 1996 and Obstfeld and Taylor 2003). To measure this effect, I included a dummy variable that took a value of one for each year that a country was on gold from the 1870s to the start of World War I. Since polities like Spain "shadowed" the gold standard while never making an official commitment, coding was at times subjective. I relied on Meissner's (2005) dates at which a currency became de facto and de jure convertible into gold.

Beck (2008) claims that well-specified models often do not require fixed effects by unit or time. One would like to explain effects in terms of substantive variables rather than conclude that deficit ratios were larger in say Old Regime France simply because it was Old Regime France. The econometric model accounts for over three centuries of political structure, warfare, domestic conflict, economic growth, and fiscal and monetary policy. To round out the analysis, country fixed effects were introduced to capture any constant but unmeasured (e.g. economic, geographic, institutional, or political) features of individual polities that remained. For robustness, I also experimented with fixed controls at the regional level.[27]

The data set averages nearly 170 annual observations for each of the six Group 1 countries. Both Greene (2000) and Wooldridge (2003) argue that, when time spans are long, fixed effects impose a large cost in terms of lost degrees of freedom. Wooldridge in particular claims that time dummies are best employed when the ratio of observations across years for each unit is small relative to the total number of units. Since this ratio averages nearly 30 among Group 1 countries, the fixed effect approach raises major doubts here.

With the advice of Beck, Green, and Wooldridge firmly in mind, I focused on substantive variables as the most effective strategy to control for time effects in this context. Old Regime economies were typically

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[27] Regions were classified according to the UN (2008) or the CIA (2008). The UN used four relevant categories for Europe: Western (Belgium, France, Prussia/Germany, the Netherlands); Northern (England/United Kingdom, Denmark, Sweden); Southern (Italy, Portugal, Spain); and Eastern (Austria-Hungary). The CIA used five relevant categories: Western (Belgium, England/United Kingdom, France, the Netherlands); Northern (Denmark, Sweden); Southern (Italy); Southwestern (Portugal, Spain); and Central (Austria-Hungary, Prussia/Germany). The addition of either set of regional controls to the basic econometric specification did not significantly affect the results.

agricultural and subsistence-based. Economic integration between domestic as well as international markets was poor (Persson 1999, Jacks 2005, Keller and Shiue 2007, and Federico 2007). Warfare was by far the most salient sort of widespread shock across time, and military spending dominated state budgets. The regression set-up includes four war-related variables: military deaths, enemy coalitions, mercenary status, and debt default. To supplement these controls, I added an Old Regime dummy that captured the differences between the pre-1789 period and the nineteenth century. This variable not only conserved the maximum degrees of freedom, but also divided the data set into two parts with roughly equal amounts of observations between them. The year 1789 was the most natural cut-off point for many reasons. Hoffman and Rosenthal (1997b) argue that a fundamental shift in the nature of warfare and political regimes took place around that time. Both fiscal centralization and limited government typically occurred after the fall of the Old Regime. There were fewer wars as well, as the 1800s saw the rise of Pax Britannica.[28] Furthermore, the Industrial Revolution on the Continent was a nineteenth-century phenomenon (Mokyr 1998). Market integration also improved (see previous citations).

The econometric set-up assumes that it is possible to disentangle political regimes from factors such as violent conflicts and economic fundamentals. Since political arrangements influenced all of these characteristics, coefficients on the control variables rather than those on the regime ones themselves may capture some of the positive effects of institutional reforms. Hence, regime coefficients likely underestimate the total impact of political arrangements on deficit ratios.

5.2 Robustness Analysis

5.2.1 PMG Regressions

Historical review suggests that political transformations were largely exogenous to budget deficit-to-revenue ratios. To help to address any remaining endogeneity concerns, however, I now describe a supplementary econometric approach.

Pesaran and Smith (1995) propose a mean group (MG) estimator that estimates separate autoregressive distributed lag models for each country and then averages the coefficient values, where the

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[28] As discussed, I included several controls for the wars that did occur from 1789 onwards.

dependent and independent variables enter the right-hand side of the regression equation with lags of lengths p and q:

$$\text{Def}_{i,t} = \sum\nolimits_{j=1,\ldots,p} \lambda_{i,j} \, \text{Def}_{i,t-j} + \sum\nolimits_{l=0,\ldots,q} \acute{\delta}_{i,l} \, X_{i,t-1} + \mu_i + \varepsilon_{i,t} \quad (2)$$

where $\text{Def}_{i,t}$ is the budget deficit-to-revenue ratio for country i in year t, $\lambda_{i,j}$ is a scalar, $\acute{\delta}_{i,l}$ is a vector of coefficients, $X_{i,t}$ is a vector of explanatory variables including the dummy variables for political regimes, μ_i represent fixed effects, and $\varepsilon_{i,t}$ is the disturbance term.

One common model, the dynamic fixed effects (DFE) estimator, pools individual groups by imposing the same lag structure across all countries. However, several works show that the assumption of homogeneity of slope parameters is inappropriate when the number of time-series observations such as mine are large (Pesaran and Smith 1995, Im et al. 2003, Pesaran et al. 1999). Pesaran et al. (1999) thus propose an intermediate approach. The pooled mean group (PMG) estimator restricts long-run elasticities to be identical across polities but allows for short-run elasticities to be heterogeneous. The restriction of slope homogeneity is justified by appealing to the existence of similar responses of deficit ratios to political transformations over the long term, though country-specific factors may yield heterogeneous short-run responses. The PMG method is also attractive because it does not force the investigator to choose between full slope homogeneity on one hand and zero slope homogeneity on the other. To test for the hypothesis of long-run slope homogeneity – and hence the suitability of the PMG estimator – I computed a standard Hausman-type statistic.

Reparameterizing equation (2):

$$\Delta \text{Def}_{i,t} = \Phi_i \left[\text{Def}_{i,t-1} - \theta_i' X_{i,t} \right] + \sum\nolimits_{j=1,\ldots,p-1} \lambda^*_{i,j} \, \Delta \text{Def}_{i,t-j} + \sum\nolimits_{l=0,\ldots,q-1} \acute{\delta}^*_{i,l} \, \Delta X^*_{i,t-1} + \mu_i + \varepsilon_{i,t} \quad (3)$$

where the vector θ_i' defines the long-run or "equilibrium" relationship between the involved variables and Φ_i measures the speed of adjustment towards equilibrium. To remove common period effects, I subtracted the average deficit ratio across polities during the Old Regime from the deficit ratio for each country for each year from 1650 to 1788. I did the same for the period from 1789 onwards.[29]

One benefit of this reparameterization, where explanatory variables enter the regression lagged by one year, is to mitigate any contemporaneous feedback and reverse causality running from deficit ratios to

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[29] As an alternative, I included the Old Regime dummy itself in the PMG regressions. This approach did not significantly affect the findings.

political transformations. As described, a second advantage is to allow for heterogeneous adjustment

dynamics across countries, as the parameters in equation (3) are not constrained to be the same.[30] Since I

wish to test the long-run relationship between deficit ratios and political regimes, the long-run coefficients

are of primary interest. If the variables show a return to long-run equilibrium, then one would expect the

parameter Φ_i to be significantly negative.

5.2.2 Structural Breaks Tests

Structural breaks tests, which assume no a priori knowledge of major turning points in the deficit

ratio series for Group 1 countries, also supplement the regression analysis by letting the data "speak" for

themselves.[31] I use the methodology proposed by Bai and Perron (2003) that identifies multiple structural

changes in means while allowing for serial correlation. It thus improves upon the "moving windows"

technique that relies upon sequential single structural change methods.

A program created for the Regression Analysis of Time Series (RATS) software performs the Bai-

Perron procedure, which estimates the following regression for each sample country:

ln Def$_t$ = β$_0$ + $\sum_{l=1,...,L}$ β$_l$ *ln* Def$_{t-l}$ + ε$_t$ (4)

where Def$_t$ is the budget deficit-to-revenue ratio in year *t*, β$_0$ and β$_1$ through β$_L$ are parameters to be

estimated, and ε$_t$ is the disturbance term. I allowed up to five significant yearly lags of the dependent variable

($L = 5$). The RATS routine, which uses a dynamic programming algorithm to evaluate which final

partitioning of the time series data achieves a global minimization of the overall sum of squared residuals,

returns the optimal set of break points.

The RATS procedure calls for the selection of a maximum number of "best" turning points in the

time series for each country subject to a minimum number of observations between data segments. As

Willard, Guinnane, and Rosen (1996) point out, there is always a trade-off in determining parameter values.

A minimum space of two observations eliminates the chance of confounding the effects of different events

but ends up analyzing blips (false positives that characterize certain events as "long-lasting" that really were

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[30] The battery of tests suggested by Beck (2008) indicates that the data are stationary. However, another benefit of this method is to eliminate the need for such pretests. Under general conditions, the PMG estimator yields consistent estimates regardless of whether the involved variables become stationary only after differencing.

[31] For historical applications, see among others Willard et al. (1996), Brown and Burdekin (2000), Sussman and Yafeh (2000), Mauro et al. (2002), and Dincecco (2009a, 2009b).

not) rather than turning points. Longer periods of analysis, however, increase the likelihood of missing important shifts (false negatives).

There are also data limitations to consider. Since the expenditure series for Prussia became discontinuous at the start of the 1800s, when both political transformations occurred, structural breaks tests were not feasible. Though gaps from 1789 to 1815 in the expenditure series for France and the Netherlands prevented the identification of turning points associated with fiscal centralization, it was still possible to capture post-1815 breaks for limited government. The same held for Spain, since the expenditure series did not become continuous until after centralization had already occurred. After some experimentation, I selected the best three breaks with at least 15 observations (i.e. 15 years) per segment for Austria-Hungary, France, the Netherlands, and Spain.[32] A long run of data set England apart from other Group 1 countries. I thus chose the best five English breaks. Though a gap from 1688 to 1691 prevented the identification of a turning point associated with limited government, England was useful to study the relationship between military conflicts, political regimes, and deficit ratios.

6. STATISTICAL EVIDENCE

Table 5, which shows the results of the PCSE regressions, reveals that fragmented and absolutist regimes displayed significantly higher budget deficit-to-revenue ratios than any of the other regime types. The findings held for Group 1 countries only (column 1) and when Group 2 countries were included (column 2). They were also robust to checks that used alternative regime classifications. Columns (3) and (4) indicate that lagging the start dates for limited regimes by 10 years to account for uncertainty about whether executives would renege on parliamentary commitments did not significantly affect the results. Lagging the start dates by five years yielded similar findings. Ceteris paribus, the move to a centralized and absolutist regime decreased deficit ratios by 0.043 to 0.070. This result contrasts with the summary statistics presented in table 4 and suggests that, after controlling for factors such as wars, the French case and not the Dutch one was representative of the financial housekeeping effect of fiscal centralization. In particular, the positive impact of new funds appears to have outweighed the negative impact of the consolidation of fiscal powers by

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[32] I also set the maximum number of breaks to two, four, or five and the minimum number of observations to 10 or 20. The findings were robust to such changes. Among all possible combinations of parameter values, the structural breaks tests identified major turning points within 10 years or less of political transformations roughly 80 percent of the time.

executives. As theory would predict, the effect of executive limits was stronger than that of centralization. The move to a centralized and limited regime decreased deficit ratios by 0.100 to 0.112 and the move to the fragmented and limited one by 0.514 to 0.522.[33]

Whereas opponent size as proxied by coalition populations was associated with a significant increase in deficit ratios, conflict intensity as measured by average military deaths per war year was associated with a significant decrease. Mercenary activity as well as debt default also reduced deficit ratios, though with less pronounced effects. Internal factors such as domestic turmoil (civil wars, coups, and revolutions) and urbanization significantly increased deficit ratios. The monetary policy of adhering to the gold standard, however, led to a significant decrease. As expected, there were higher deficit ratios during the Old Regime than the 1800s. Austria-Hungary and the Netherlands (as well as the Group 2 countries) had notably larger deficit ratios than England while France, Prussia, and Spain had notably lower ones.

Table 6, which shows the results of the PMG regressions, supports the previous findings. Once more fragmented and absolutist regimes displayed significantly higher deficit ratios than the other regime types. Long-run relative elasticities ranged between – 0.200 and – 0.240 for centralized and absolutist regimes, – 0.167 and – 0.201 for centralized and limited ones, and – 0.571 and – 0.661 for the fragmented and limited one. The speed of adjustment parameter was also negative and significant. Hausman tests, which compared the PMG, MG, and DFE estimators, failed to reject the PMG restriction that long-run coefficients were similar across countries. Hence, the PMG estimates were consistent and efficient.[34]

Table 7, which displays the results of the structural breaks tests, shows close relationships between major turning points and political transformations. It also highlights the link between those reforms and military competition and conflicts. In France, the break that occurred in 1870 coincided with the establishment of limited government as well as with the Franco-Prussian War (1870-1871). Budget deficit-to-revenue ratios fell by 175 percent in the 15 years that followed this change as compared to the 15 years that preceded it. Other turning points were associated with renewed military efforts in North Africa at the start of the 1840s and the coup d'etat and subsequent establishment of an authoritarian regime by Napoleon

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[33] Since there was only one example of the fragmented and limited regime (i.e. the Dutch Republic) among sample countries, the magnitude of this result should be interpreted with care.

[34] Hausman test statistics were negative, which Hausman and McFadden (1984) attribute to a lack of positive semidefiniteness in finite samples. The authors interpret negative test scores as strong evidence of failure to reject the null hypothesis that the PMG estimator is consistent and efficient.

III at the start of the 1850s. In the Netherlands, the best breaks came with the end of the Belgian War of Independence (1833), near limited government (1850), and with an unidentified event in 1867. Limited government, which occurred during the Year of Revolutions in 1848, was associated with a decrease in deficit ratios of nearly 40 percent. In Spain, we observe turning points with the start of the Naval War against Peru (1865), near limited government (1880), and with the Spanish-American War (1898). Limited government occurred at the end of the Third Carlist Civil War (1872-1876). This set of events led to a decrease in deficit ratios of almost 50 percent.

Breaks for Austria-Hungary occurred near the end (1810) of the Napoleonic Wars, near fiscal centralization (1846), and with the nationalization of railways (1880s). Deficit ratios rose by 215 percent in the 15 years that followed centralization as compared to the 15 years that preceded it. Military conflicts played a major role in this increase. Austria-Hungary, which did not participate in any major wars from 1815 to 1847, entered six such conflicts from 1848 to 1866.[35] Curiously, limited government in 1867 was not included as one of the top three turning points in Austria-Hungary, though several unreported specifications selected nearby years as the fourth-best break. Figure 5 indicates a substantial decrease in deficit ratios from 1867 to 1868, which then rose over the next two decades as the Austrian government expanded the national railway system.

Recall that a data gap prevented the identification of a break with limited government in England. However, turning points in the English series highlight the role of military conflicts. The top five breaks from 1692 to 1913 came near the end of the War of the Spanish Succession (1711), near the starts of the War of the Austrian Succession (1737) and the Seven Years' War (1753), and near the start (1797) and end (1814) of the Napoleonic Wars. In each case, English fiscal policies were consistent with tax-smoothing: increases in deficit ratios at the start of conflicts and decreases at war's end.

7. CONCLUSION

Dincecco (2009b) argues that fiscal centralization and limited government each led to significant improvements in sovereign credit risk. The current results highlight one mechanism through which political

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[35] These were the Austro-Sardo War (1848-1849), the First War of Italian Independence (1848-1849), the Franco-Austrian War (1859), the Second Italian War of Independence (1859-1861), the Second Schleswig-Holstein War (1864), and the Austro-Prussian War (1866).

regimes had a positive creditworthiness effect. PCSE and PMG regressions on the panel data set indicate that centralized and limited regimes were associated with significant decreases in budget deficit-to-revenues ratios relative to fragmented and absolutist ones. Structural breaks tests that assume no a priori knowledge of possible turning points in the deficit ratio series support these conclusions.

The findings concur with the evolution of political regimes and public finances from 1650 to 1913 as described by Dincecco (2009a). Centralization generated an increase in per capita revenues that made it easier for crowns to follow sound fiscal policies. Financial prudence improved as a result. Rulers could still use new revenues in foolish ways, however. By placing checks on executive spending, limited government also led to a decrease in deficit ratios.

Though today's world differs from the world prior to World War I, many of the same issues remain. The findings indicate that there is a significant relationship between political arrangements and the ability of governments to tax smooth over wars and other short-term shocks. States that survive conflicts and achieve long-run prosperity are those that have their fiscal houses in order. Thus, political transformations such as centralization and limited government are important milestones in the development process.

Our lesson from history suggests that countries that are able to overcome both "weak" and "strong" institutional problems such as South Korea and Taiwan have promising economic futures. Many parts of Africa and South America, however, still experience a growth-stifling combination of fragmented sovereignty and "absolutist" (i.e. autocratic) rule. Political transformations like the ones that took place in Europe centuries ago would benefit such polities. Indeed, a future research goal is to adapt the statistical framework used here to post-1960 circumstances in order to quantify the potential effects of political reform.

APPENDIX A. SOURCES FOR EXPENDITURE DATA

Public expenditures concern total spending by national governments including debt service. Loan amounts were incorporated whenever possible. I use abbreviations to denote different series for expenditure (EXP1, EXP2,…). For additional details, see text. For public revenues, see Dincecco (2009a). That work also explains the methods by which different currency units were transformed into grams of gold.

Austria-Hungary. EXP1 is central government expenditure, 1781-1913, from Mitchell (2003). The series covers Austria-Hungary through 1867 and Cisleithania (i.e. the Austrian portion) from 1868 onwards. Figures do not include expenditures on tax collection through 1864. Total yields through 1874 are for cash payments made by the Treasury. From 1875 onwards, they include obligations undertaken and the change in the Treasury's cash balance. EXP2 is central government revenue in Transleithania (i.e. the Hungarian portion), 1868-1913, from Mitchell, IHS. The series of Austria-Hungary central government expenditures consists of EXP1: 1781-1867; EXP1 + EXP2: 1868-1913.

Belgium. EXP1 is central government expenditure, 1831-1912, from Mitchell (2003). Data are unavailable for 1913. The series of Belgian central government expenditures consists of EXP1: 1831-1912.

Denmark. EXP1 is central government expenditure, 1854-1913, from Mitchell (2003). Figures include the Duchies of Schleswig, Holstein, and Lauenburg from 1854-1865. The series of Danish central government expenditures consists of EXP1: 1873-1913.

England (Britain). EXP1 is issues and assignments for the English exchequer, 1660-1687, from Chandaman (1975), 339-366. To calculate total expenditures, I added issues (listed at one-half year intervals, A and B) and assignments (also listed at one-half year intervals, A and B). EXP2 is total net expenditure including debt charges for Great Britain, 1692-1801, from Mitchell (1988). EXP3 is central government expenditure for Great Britain, 1750-1801, and for the United Kingdom, 1802-1913, from Mitchell (2003). The series of British central government expenditures consists of EXP1: 1650-1687; EXP2: 1692-1749; EXP3: 1750-1913.

France. EXP1 is royal expenditure in France, 1600-1695, from Bonney (1995b). EXP2 is royal expenditure in France, 1670-1715, from Bonney (1995c). EXP3 is French ordinary expenditure, 1727-1813, from Bonney (1995d). EXP4 is expenditure of the French monarchy at various dates between 1773 and 1785 from Bonney (1995e). EXP5 is total French expenditure, 1801-1844, from Bonney (1995f). EXP6 is ordinary and extraordinary central government expenditure, 1815-1913, from Mitchell (2003). The series of French central government expenditures consists of EXP1: 1650-1656, 1662-1683; EXP2: 1684-1715; EXP3: 1727-1752, 1764-1765, 1767-1768, 1780-1781, 1788-1796; EXP4: 1785; EXP5: 1801-1814; EXP6: 1815-1913.[36]

Italy. EXP1 is central government expenditure, 1862-1913, from Mitchell (2003). Data are unavailable for 1884-1885. The series of Italian central government expenditures consists of EXP1: 1862-1913.

The Netherlands. EXP1 is total expenditures in the Dutch Republic, 1720-1794. The computation method was as follows. First, totals for Drenthe, Friesland, Groningen, Holland, Overijssel, and Utrecht were tallied from Fritschy et al. (2007).[37] Sums included expenditures on behalf of the Generality as well as provincial ones. Total expenditures for Gelderland were calculated according to the official quotas for Overijssel (3.60 percent) and Gelderland (5.61 percent) as described in De Vries and Van der Woude (1997). Gelderland totals were thus computed as (5.61 / 3.60) = 1.56 times the totals for Overijssel. Data for Zeeland were from Veenstra (2009). In 1790, roughly 80 percent of defense expenditures for the Republic came from the seven provinces and Drenthe. According to Liesker and Fritschy (2004), the remaining roughly 20 percent came from other parts: 11 percent from the admiralities; 7 percent from Brabant; and 2 percent from additional central revenue sources. I used the series of Holland's expenditures on behalf of the Generality to calculate the remaining portion of Generality expenditures. During the 1700s, Holland paid an annual amount of roughly 60 percent of total Generality expenditures from the seven provinces and Drenthe, or 48 percent of Generality expenditures overall. I thus computed the remaining portion of yearly Generality expenditures as

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[36] Massive inflation, which occurred in the aftermath of the French Revolution, resulted in per capita expenditure calculations that were non-sensical. They were 1792, 49.24 grams of gold; 1793, 95.94 grams of gold; 1794, 170.87 grams of gold; 1795, 204.09 grams of gold; and 1796, 0.07 grams of gold. By comparison, per capita expenditures were 7.62 grams of gold in 1791 and 6.16 grams of gold in 1801 (i.e. the next available observation). I thus excluded the expenditure data for years 1792-1796 from the analysis.

[37] Wantje Fritschy provided hard copies of these data, which came from printed volumes whose titles and publication details may be found on the Institute for Netherlands History Project website (www.inghist.nl).

(20 / 48) = 0.417 or 42 percent of Holland's expenditures on behalf of the Generality.[38] Finally, total expenditures for the Republic as a whole were calculated as sums of the previous categories. EXP2 is expenditures in the Batavian Republic and its successors, 1803-1810, from Van Zanden and Van Riel (2004). EXP3 is estimates of expenditures in the Netherlands, 1814-1913, provided by Jan Luiten Van Zanden. His figures exclude southern provinces like Belgium. For comparison, see Fritschy and Van Der Voort (1997). The series of Dutch central government expenditures consists of EXP1: 1720-1795; EXP2: 1803-1810; EXP3: 1814-1913.

Portugal. EXP1 is effective central government expenditure, 1852-1913, from Mata (1993).[39] The series of Portuguese central government expenditures consists of EXP1: 1852-1913.

Prussia. EXP1 is total expenditure of the Prussian state, 1688-1806, from Korner (1995). EXP2 is expenditures, 1821-1866, from Tilly (1966), 492, and Tilly (1967), 391. EXP3 is total ordinary expenditures, 1807-1913, from Mauersberg (1988), 125.[40] The series of Prussian central government expenditures consists of EXP1: 1688-1806; EXP2: 1838, 1849, 1853, 1856, 1866; EXP3: 1821, 1829, 1841, 1847, 1850, 1855, 1860, 1867, 1868, 1870, 1874, 1875, 1880, 1885, 1890, 1900, 1905, 1910.

Spain. EXP1 is *Gastos del Estado*, 1801-1842, from Carreras and Tafunell (2006). EXP2 is *Gastos del Estado*, 1845-1913, from Carreras and Tafunell (2006). The series of Spanish central government expenditures consists of EXP1: 1801-1803, 1805-1807, 1813-1817, 1819-1822, 1827-1828, 1830-1831, 1833-1839, 1841-1842; EXP2: 1845, 1849-1913.

Sweden. EXP1 is central government expenditure, 1881-1913, from Mitchell (2003). The series of Swedish central government expenditures consists of EXP1: 1881-1913.

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[38] However, the percentage of expenditures for the admiralties was lower during the Fourth Anglo-Dutch War (1780-1784), which was fought at sea.
[39] Rui Esteves provided these data. Figures are for fiscal years 1851-1852, 1852-1853, and so on. Hence, I took an average of the two surrounding fiscal years to compute annual expenditures.
[40] Mark Spoerer provided these data.

REFERENCES

Acemoglu, D., 2005, Politics and Economics in Weak and Strong States, *Journal of Monetary Economics* 52, 1199-1226.

Acemoglu, D., S. Johnson and J. Robinson, 2001, Colonial Origins of Comparative Development: An Empirical Investigation, *American Economic Review* 91, 1369-1401.

Acemoglu, D., S. Johnson and J. Robinson, 2002, Reversal of Fortune: Geography and Development in the Making of the Modern World Income Distribution, *Quarterly Journal of Economics* 117, 1231-1294.

Acemoglu, D., J. Robinson and T. Verdier, 2004, Alfred Marshall Lecture – Kleptocracy and Divide-and-Rule: A Model of Personal Rule, *Journal of the European Economic Association* 2, 162-192.

Acemoglu, D., S. Johnson and J. Robinson, 2005, The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth, *American Economic Review* 94, 546-579.

Acemoglu, D., D. Cantoni, S. Johnson and J. Robinson, 2008, From Ancien Régime to Capitalism: The French Revolution as a Natural Experiment, Mimeo, Harvard University.

Aiyagari, R., A. Marcet, T. Sargent and J. Seppala, 2002, Optimal Taxation without State-Contingent Debt, *Journal of Political Economy* 110, 1220-1254.

Alesina, A. and R. Perotti, 1995, The Political Economy of Budget Deficits, *IMF Staff Papers* 42, 1-31.

Bai, J. and P. Perron, 2003, Computation and Analysis of Multiple Structural-Change Models, *Journal of Applied Econometrics* 18, 1-22.

Bairoch, P., 1988, *Cities and Economic Development* (Chicago University Press, Chicago).

Bates, R., 2001, *Prosperity and Violence* (Harvard University Press, Cambridge).

Barro, R., 1979, On the Determination of Public Debt, *Journal of Political Economy* 87, 940-971.

Barro, R., 1987, Government Spending, Interest Rates, Prices, and Budget Deficits in the United Kingdom, 1701-1918, *Journal of Monetary Economics* 20, 221-248.

Barro, R., 1989, The Neoclassical Approach to Fiscal Policy, in: R. Barro, ed., *Modern Business Cycle Theory* (Cambridge University Press, Cambridge) 178-235.

Beck, N., 2008, Time-Series Cross-Section Methods, in: J. Box-Steffensmeier, H. Brady, and D. Collier, eds., *The Oxford Handbook of Political Methodology* (Oxford University Press, London) 475-493.

Beck, N. and J. Katz, 1995, What to Do (and not to Do) with Time-Series Cross-Section Data, *American Political Science Review* 89, 634-647.

Berger, H. and M. Spoerer, 2001, Economic Crises and the European Revolutions of 1848, *Journal of Economic History* 61, 293-326.

Bonney, R., 1995a, *Economic Systems and State Finance* (Oxford University Press, Oxford).

Bonney, R., 1995b, Malet's figures for royal expenditure in France, 1600-95 (\rjb\malet\malm001.txt), *European State Financial Database*, www.le.ac.uk/hi/bon/ESFDB/.

Bonney, R., 1995c, Forbonnais: Royal expenditure in France, 1670-1715 (\rjb\forbon\ford001.txt), *European State Financial Database*, www.le.ac.uk/hi/bon/ESFDB/.

Bonney, R., 1995d, French Ordinary Revenue and Expenditure, 1727-1814 (\rjb\frm\003.txt), *European State Financial Database*, www.le.ac.uk/hi/bon/ESFDB/.

Bonney, R., 1995e, Revenue & expenditure of the French monarchy at various dates between 1773 and 1785 (\rjb\frm\010.txt), *European State Financial Database*, www.le.ac.uk/hi/bon/ESFDB/.

Bonney, R., 1995f, Total French expenditure, 1801-1844 (\rjb\frm\002.txt), *European State Financial Database*, www.le.ac.uk/hi/bon/ESFDB/.

Bonney, R., 1999, *The Rise of the Fiscal State in Europe, 1200-1815* (Oxford University Press, Oxford).

Bordo, M. and E. White, 1991, A Tale of Two Currencies: British and French Finance During the Napoleonic Wars, *Journal of Economic History* 51, 303-316.

Bordo, M. and H. Rockoff, 1996, The Gold Standard as a Good Housekeeping Seal of Approval, *Journal of Economic History* 56, 389-428.

Brewer, J., 1989, *The Sinews of Power* (Unwin Hyman, London).

Brennan, G. and J. Buchanan, 1980, *The Power to Tax* (Cambridge University Press, New York).

Brown, W. and R. Burdekin, 2000, Turning Points in the U.S. Civil War: A British Perspective, *Journal of Economic History* 60, 216-231.

Cain, P.J. and A.G. Hopkins, 1994, *British Imperialism* (Longman, London).

Carreras, A. and X. Tafunell, 2006, *Estadisticas Historicas de Espana* (Fundacìon BBVA, Madrid).

Chandaman, C.D., 1975, *The English Public Revenue, 1660-1688* (Clarendon Press, Oxford).

Central Intelligence Agency, 2008, *Field Listing – Location*,

https://www.cia.gov/library/publications/the-world-factbook/fields/2144.html.

Clodfelter, M., 2002, *Warfare and Armed Conflicts: A Statistical Reference, 1500-2000* (McFarland, Jefferson).

Davis, L. and R. Huttenback, 1986, *Mammon and the Pursuit of Empire* (Cambridge University Press, Cambridge).

De Long, J. B. and A. Shleifer, 1993, Princes and Merchants: European City Growth Before the Industrial Revolution, *Journal of Law and Economics* 36, 671-702.

De Vries, J., 1984, *European Urbanization, 1500-1800* (Harvard University Press, Cambridge).

De Vries, J. and A. van Der Woude, 1997, *The First Modern Economy, 1500-1815* (Cambridge University Press, Cambridge).

Dickson, P., 1967, *The Financial Revolution in England* (St. Martin's Press, New York).

Dincecco, M., 2009a, Fiscal Centralization, Limited Government, and Public Revenues in Europe, 1650-1913, *Journal of Economic History* 69, 48-103.

Dincecco, M., 2009b, Political Regimes and Sovereign Credit Risk in Europe, 1750-1913, Forthcoming, *European Review of Economic History*.

Drelichman, M. and H.J. Voth, 2008, Debt Sustainability in Historical Perspective: The Role of Fiscal Repression, *Journal of the European Economics Association* 6, 657-667.

Epstein, S.R., 2000, *Freedom and Growth* (Routledge, London).

Encyclopedia Britannica 2007.

Federico, G., 2007, The First European Grain Invasion: A Study in the Integration of the European Market, 1750-1870, Mimeo, European University Institute.

Federico, G., 2008, Always on the Brink: Italy, 1861-1914, in: Forthcoming, J.L. Cardoso and P. Lains, eds., *Paying for the Liberal State* (Cambridge University Press, Cambridge).

Ferguson, N., 1998, *The House of Rothschild* (Penguin, New York).

Ferguson, N., 2006, Political Risk and the International Bond Market Between the 1848 Revolution and the Outbreak of the First World War, *Economic History Review* 59, 70-112.

Ferguson, N. and M. Schularick, 2006, The Empire Effect: Determinants of Country Risk in the First Age of Globalization, 1880–1913, *Journal of Economic History* 66, 283-312.

Flandreau, M. and F. Zumer, 2004, *The Making of Global Finance, 1880-1913* (OECD, Paris).

Frey, B. and M. Kucher, 2000, History as Reflected in Capital Markets: The Case of World War II, *Journal of Economic History* 60, 468-496.

Fritschy, W. and R. Van Der Voort, 1997, From Fragmentation to Unification: Public Finance, 1700-1914, in: M. Hart, J. Jonker, and J.L. Van Zanden, eds., *A Financial History of the Netherlands* (Cambridge University Press, Cambridge) 64-93.

Fritschy, W., M. t'Hart and E. Horlings, 2003, Continuities and Discontinuities in Dutch Fiscal History, 1515-1913, Mimeo, Fifteenth Economic History Congress.

Fritschy, Wantje et al., 2007, Provincial Finances in the Days of the Republic of the United Netherlands, *Institute for Netherlands History Project*, http://www.inghist.nl/.

Greene, W., 2000, *Econometric Analysis* (Prentice-Hall, Upper Saddle River).

Hausman, J. and D. McFadden, 1984, Specification Tests for the Multinomial Logit Model, *Econometrica* 52, 1219-1240.

Herbst, J., 2000, *States and Power in Africa* (Princeton University Press, Princeton).

Hoffman, P. and Kathryn N., 1994, *Fiscal Crises, Liberty, and Representative Government, 1450-1789* (Stanford University Press, Palo Alto).

Hoffman, P. and J.L. Rosenthal, 1997a, The Political Economy of Warfare and Taxation in Early Modern Europe: Historical Lessons for Economic Development, in: J. Drobak and J. Nye, eds., *The Frontiers of the New Institutional Economics* (Academic Press: St. Louis) 31-55.

Hoffman, P. and J.L. Rosenthal, 1997b, Divided We Fall: The Political Economy of Warfare and Taxation, Mimeo, California Institute of Technology.

Hohenberg, P. and L. Lees, 1985, *The Making of Urban Europe, 1000-1950* (Harvard University Press: Cambridge).

Im, K.S., H. Pesaran and Y.C. Shin, 2003, Testing for Unit Roots in Heterogeneous Panels, *Journal of Econometrics* 115, 473-491.

Jacks, D., 2005, Intra- and International Commodity Market Integration in the Atlantic Economy, 1800-1913, *Explorations in Economic History* 42, 381-413.

Jaggers, K. and M. Marshall, 2008, Polity IV Project: Political Regime Characteristics and Transitions, 1800-2007, Mimeo, George Mason University.

Jones, J., 1994, Fiscal Polities, Liberties, and Representative Government during the Reigns of the Last Stuarts, in: P. Hoffman and K. Norberg, eds., *Fiscal Crises, Liberty, and Representative Government, 1450-1789* (Stanford University Press, Palo Alto) 67-95.

Keller, W. and C. Shiue, 2007, Markets in China and Europe on the Eve of the Industrial Revolution, *American Economic Review* 97, 1189-1216.

Kiser, E. and J. Schneider, 1994, Bureaucracy and Efficiency: An Analysis of Taxation in Early Modern Prussia, *American Sociological Review* 59, 187-204.

Kindleberger, C., 1984, *A Financial History of Western Europe* (Allen and Unwin, London).

Knack, S. and P. Keefer, 1995, Institutions and Economic Performance: Cross-Country Tests Using Alternative Measures, *Economics and Politics* 7, 207-227.

Korner, M., 1995, Total Revenue and Expenditure of the Prussian State, 1688-1806 (\korner\prussia\prum003.txt), *European State Financial Database*, www.le.ac.uk/hi/bon/ESFDB/.

Kydland, F. and E. Prescott, 1977, Rules Rather Than Discretion: The Inconsistency of Optimal Plans, *Journal of Political Economy* 85, 473-491.

La Porta, R., F. Lopez-de-Silanes and A. Shleifer, 2008, The Economic Consequences of Legal Origins, *Journal of Economic Literature* 46, 285-332.

Levi, M., 1988, *Of Rule and Revenue* (University of California Press, Berkeley).

Lindert, P., 2004, *Growing Public* (Cambridge University Press, New York).

Liesker, R. and W. Fritschy, 2004, Gewestelijke financien ten tijde van de Republiek der Verenigde Nederlanden, Volume 4: Holland 1572-1795, *Institute for Netherlands History Project*, http://www.inghist.nl/.

Lucas, R. and N. Stokey, 1983, Optimal Fiscal and Monetary Policy in an Economy Without Capital, *Journal of Monetary Economics* 12, 55-93.

Maddala, G.S. and S. Wu, 1999, A Comparative Study of Unit Root Tests with Panel Data and New Simple Test, *Oxford Bulletin of Economics and Statistics* 61, 631-652.

Maddison, A., 2003, *The World Economy: Historical Statistics* (OECD, Paris).

Mankiw, N. G., 1989, The Optimal Collection of Seigniorage: Theory and Evidence, *Journal of Monetary Economics* 20, 327-341.

Mata, M., 1993, *As Finanças Públicas Portuguesas da Regeneração à Primeira Guerra Mundial* (Banco de Portugal, Lisbon).

Mauersberg, H., 1988, *Finanzstrukturen Deutscher Bundesstaaten Zwischen 1820 und 1944* (Scripta Mercaturae Verlag, St. Katharinen).

Mauro, P., N. Sussman and Y. Yafeh, 2002, Emerging Market Spreads: Then Versus Now, *Quarterly Journal of Economics* 117, 695-733.

Mathias, P. and P. O'Brien, 1976, Taxation in Britain and France, 1715-1810: A Comparison of the Social and Economic Incidence of Taxes Collected for the Central Governments, *Journal of European Economic History* 5, 601-650.

McGuire, M. and M. Olson, 1996, The Economics of Autocracy and Majority Rule: The Invisible Hand and the Use of Force, *Journal of Economic Literature* 34, 72-96.

Migdal, J., 1988, *Strong Societies and Weak States* (Princeton University Press, Princeton).

Meissner, C., 2005, A New World Order: Explaining the Emergence of the Classic Gold Standard, *Journal of International Economics* 6, 385-406.

Mitchell, B., 1988, *British Historical Statistics* (Cambridge University Press, New York).

Mitchell, B., 2003, *International Historical Statistics: Europe, 1750-2000* (Palgrave Macmillan, New York).

Mokyr, J., 1998, *The Second Industrial Revolution, 1870-1914*, in: V. Castronono, ed., *Storia dell'economia Mondiale* (Laterza, Rome) 219-245.

Mokyr, J., 1999, *The British Industrial Revolution* (Westview, Boulder).

North, D., 1981, *Structure and Change in Economic History* (Norton, New York).

North, D. and B. Weingast, 1989, Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth Century England, *Journal of Economic History* 49, 803-832.

O'Brien, P., 2001, Fiscal Exceptionalism: Great Britain and its European Rivals, from Civil War to Triumph at Trafalgar and Waterloo, Working Paper 65/01, London School of Economics.

Obstfeld, M. and A. Taylor, 2003, Sovereign Risk, Credibility, and the Gold Standard: 1870-1913 Versus 1925-31, *Economic Journal* 113, 241-275.

Officer, L., 2006, The Price of Gold, 1257-2005, *MeasuringWorth.com*, http://www.measuringworth.com/gold/.

Persson, K., 1999, *Grain Markets in Europe, 1500-1900: Integration and Deregulation* (Cambridge University Press, Cambridge).

Pesaran, H. and R. Smith, 1995, Estimating Long-run Relationships from Dynamic Heterogeneous Panels, *Journal of Econometrics* 68, 79-113.

Pesaran, H., Y.C. Shin and R. Smith, 1999, Pooled Mean Group Estimation of Dynamic Heterogeneous Panels, *Journal of the American Statistical Association* 94, 621-634.

Quinn, Stephen, 2001, The Glorious Revolution's Effect on English Private Finance: A Microhistory, 1680-1705, *Journal of Economic History* 61, 593-615.

Reinhart, C., K. Rogoff and M. Savastano, 2003, Debt Intolerance, *Brookings Papers on Economic Activity* 1, 1-74.

Rosenthal, J.L., 1998, The Political Economy of Absolutism Reconsidered, in: R. Bates et al., eds., *Analytic Narratives* (Princeton University Press, Princeton) 64-108

Rosenthal, J.L. and R. B. Wong, 2007, *Warfare and Economic Growth in China and Europe*, Mimeo, University of California, Los Angeles.

Sargent, T. and F. Velde, 1995, Macroeconomic Features of the French Revolution, *Journal of Political Economy* 103, 474-518.

Stasavage, D., 2003, *Public Debt and the Birth of the Democratic State: France and Great Britain, 1688-1789* (Cambridge University Press, Cambridge).

Stasavage, D., 2005, Cities, Constitutions, and Sovereign Borrowing in Europe, 1274-1785, *International Organization* 61, 489-526.

Summerhill, W., 2004, *Inglorious Revolution*, Mimeo, University of California, Los Angeles.

Sussman, N. and Y. Yafeh, 2000, Institutions, Reforms, and Country Risk: Lessons from Japanese Government Debt in the Meiji Era, *Journal of Economic History* 60, 442-467.

Sussman, N. and Y. Yafeh, 2006, Institutional Reforms, Financial Development and Sovereign Debt: Britain, 1690–1790, *Journal of Economic History* 66, 906-935.

Tilly, C., L. Tilly and R. Tilly, 1975, *The Rebellious Century, 1830-1930* (Harvard University Press, Cambridge).

Tilly, C., 1990, *Coercion, Capital, and European States, 990-1990* (Blackwell, Cambridge).

Tilly, R., 1966, The Political Economy of Public Finance and the Industrialization of Prussia, 1815-1866, *Journal of Economic History* 26, 484-497.

Tilly, R., 1967, The Political Economy of Public Finance and the Industrialization of Prussia: A Correction, *Journal of Economic History* 27, 391.

Tortella, G., 2000, *The Development of Modern Spain* (Harvard University Press, Cambridge).

United Nations Statistical Division, 2008, *Geographic Regions and Composition*, http://unstats.un.org/unsd/methods/m49/m49regin.htm.

Van Zanden, J.L. and A. Van Riel, 2004, *The Strictures of Inheritance: The Dutch Economy in the Nineteenth Century* (Princeton University Press, Princeton).

Veenstra, W., 2009, Gewestelijke financiën ten tijde van de Republiek der Verenigde Nederlanden. Deel 7. Zeeland (1573-1795), *Institute for Netherlands History Project*, http://www.inghist.nl/.

Velde, F. and D. Weir, 1992, Tontines, Public Finance, and Revolution in France and England, 1688-1789, *Journal of Economic History* 49, 95-124.

Wade, R., 1990, *Governing the Market* (Princeton University Press, Princeton).

Weir, D., 1989, The Financial Market and Government Debt Policy in France, 1746-1793, *Journal of Economic History* 52, 1-39.

White, E., 1989, Was There a Solution to the Ancien Régime's Financial Dilemma?, *Journal of Economic History* 49, 545-568.

White, E., 1995, The French Revolution and the Politics of Government Finance, 1770-1815, *Journal of Economic History* 55, 227-255.

White, E., 2001, France and the Failure to Modernize Macroeconomic Institutions, in: M. Bordo and R. Cortès-Conde, eds., *Transferring Wealth and Power from the Old to the New World* (Cambridge University Press, Cambridge) 59-99.

Willard, K., T. Guinnane and H. Rosen, 1996, Turning Points in the Civil War: Views from the Greenback Market, *American Economic Review* 86, 1001-1018.

Wooldridge, J., 2003, *Introductory Econometrics* (Thomson South-Western, Mason).

Table 1. Fiscal Centralization in Europe

		Year	Event
Group 1	England	1066	Norman conquest and subsequent erosion of provincial authority
	France	1790	Administrative reforms after Revolution of 1789
	Netherlands	1806	Administrative reforms under French control (1795-1813)
	Prussia	1806	Administrative reforms after defeat in battle by French in 1806
	Spain	1844	Administrative reforms during "Moderate" decade of 1840s
	Austria-Hungary	1848	Administrative reforms during Year of Revolutions
Group 2	Denmark	1688	Establishment of official cadastre system
	Belgium	1795	Administrative reforms after French annexation in 1795
	Portugal	1832	Administrative reforms during Revolutionary era (1820-1851)
	Sweden	1840	"Departmental" reforms
	Italy	1861	Establishment of Kingdom in 1861 and subsequent fiscal unification

Source: Dincecco (2009a).

Notes: The first column lists sample countries by group. Long annual data series over a variety of political regimes characterize Group 1, which includes the largest and/or most important players in Europe at the time. Group 2 has shorter data series. The second column displays the year that fiscal centralization was completed. The final column offers brief "explanations" for the dates.

Table 2. Limited Government in Europe

		Year	Event
Group 1	Netherlands	1572	Formation of Dutch Republic (1572-1795)
		1848	Implementation of new constitution
	England	1688	Establishment of constitutional monarchy
	Prussia	1848	Establishment of constitutional monarchy
	Austria-Hungary	1867	Establishment of constitutional monarchy
	France	1870	Establishment of stable constitutional regime
	Spain	1876	Establishment of stable constitutional monarchy
Group 2	Denmark	None	Absolutism restored (1866) after short-lived constitutional regime
	Belgium	1831	Established as a constitutional monarchy
	Portugal	1851	Establishment of stable constitutional monarchy
	Italy	1861	Established as a constitutional monarchy
	Sweden	1866	Dissolution of Estates and introduction of bicameral legislature

Source: Dincecco (2009a).

Notes: The first column lists sample countries by group, which table 1 describes. The second column displays the year that limited government emerged. The final column offers brief "explanations" for the dates.

Table 3. Deficit Ratio Characteristics of Political Regimes

Regime	Deficit ratios
Fragmented and absolutist	High due to local free riding and lack of credible commitment
Centralized and absolutist	Decrease due to resolution of free riding OR increase due to executive consolidation of fiscal powers and lack of credible commitment
Fragmented and limited	Decrease due to credible commitment but still local free riding
Centralized and limited	Low due to resolution of local free riding and credible commitment

Sources: See text.

Table 4. Summary Statistics of Deficit Ratio Data

	Obs.	Mean	St. Dev.	Min	Max
All regimes	1284	0.19	0.36	-0.89	2.93
Fragmented and absolutist	310	0.18	0.50	-0.89	2.77
Centralized and absolutist	237	0.26	0.43	-0.41	2.93
Fragmented and limited	75	0.19	0.17	0.01	0.77
Centralized and limited	662	0.16	0.26	-0.41	1.92

Sources: See Appendix A.

Notes: Among Group 1 countries, there are 133 observations for Austria-Hungary (1781-1913); 249 for England (1650-1687, 1692-1913); 213 for France (1650-1656, 1662-1715, 1727-1752, 1764-1765, 1767-1768, 1780-1781, 1785, 1788-1796, 1801-1913); 186 for the Netherlands (1720-1795, 1803-1810, 1814-1913); 142 for Prussia (1688-1806, 1821, 1829, 1838, 1841, 1847, 1849, 1850, 1853, 1855, 1856, 1860, 1866, 1867, 1868, 1870, 1874, 1875, 1880, 1885, 1890, 1900, 1905, 1910); and 93 for Spain (1801-1803, 1805-1807, 1813-1817, 1819-1822, 1827-1828, 1830-1831, 1833-1839, 1841-1842, 1845, 1849-1913). Among Group 2 countries, there are 82 observations for Belgium (1831-1912); 41 for Denmark (1873-1913); 50 for Italy (1862-1913); 62 for Portugal (1852-1913); and 33 for Sweden (1881-1913). For additional details, see Appendix A.

Table 5. PCSE Regression Results for Political Regimes and Fiscal Prudence

	(1) Group 1 Only, Standard	(2) Groups 1 & 2, Standard	(3) Group 1 Only, Lagged Start	(4) Groups 1 & 2, Lagged Start
Centralized and absolutist regimes	- 0.0602*	- 0.0433**	- 0.0699**	- 0.0644***
	(1.86)	(2.39)	(2.23)	(3.57)
Fragmented and limited regime	- 0.5217***	- 0.5198***	- 0.5210***	- 0.5139***
	(11.29)	(12.94)	(11.18)	(12.69)
Centralized and limited regimes	- 0.1073***	- 0.1117***	- 0.1085***	- 0.0995***
	(3.37)	(5.07)	(3.23)	(4.17)
Military deaths per year	-0.000472**	-0.000428***	-0.000464***	-0.000413***
	(3.61)	(5.72)	(3.44)	(5.40)
Enemy coalition population	0.005224**	0.005384***	0.005230***	0.005398***
	(9.05)	(12.80)	(8.87)	(12.67)
Mercenary	- 0.0621	- 0.0773**	- 0.0598	- 0.0745**
	(1.48)	(2.18)	(1.44)	(2.09)
Default	- 0.0911	- 0.0914***	- 0.0938	- 0.0934***
	(1.18)	(2.56)	(1.22)	(2.60)
Civil wars, coups, revolutions	0.2662***	0.2552***	0.2673***	0.2621***
	(5.20)	(13.52)	(5.19)	(13.73)
Urbanization rate	0.4115***	0.3619***	0.3998***	0.3104**
	(2.80)	(2.73)	(2.72)	(2.36)
Gold standard	- 0.2135***	- 0.1498***	- 0.2127***	- 0.1521***
	(6.54)	(9.95)	(6.05)	(9.51)
Old Regime	0.0447*	0.0704***	0.0435*	0.0657***
	(1.72)	(3.83)	(1.64)	(3.54)
Austria-Hungary	0.1662***	0.1954***	0.1619***	0.1900***
	(3.52)	(6.47)	(3.40)	(6.25)
France	- 0.0575**	- 0.0549***	- 0.0581**	- 0.0491***
	(2.17)	(2.96)	(2.11)	(2.61)
Netherlands	0.3346***	0.3484***	0.3346***	0.3570***
	(12.76)	(12.13)	(12.51)	(12.07)
Prussia	- 0.2010***	- 0.1915***	- 0.2054***	- 0.1939***
	(5.30)	(5.54)	(4.04)	(5.65)
Spain	- 0.1715***	- 0.1379***	- 0.1744***	- 0.1381***
	(4.00)	(6.51)	(4.04)	(6.47)
Belgium		0.0981***		0.0892***
		(4.65)		(4.24)
Denmark		0.0792**		0.1041**
		(2.29)		(3.04)
Italy		0.1653***		0.1576***
		(6.36)		(6.10)
Portugal		0.3537***		0.3388***
		(7.29)		(7.08)
Sweden		0.0671***		0.0592**
		(2.52)		(2.25)
Constant	0.1766***	0.1511***	0.1805***	0.1564***
	(3.34)	(4.45)	(3.37)	(4.62)
Observations	976	1244	976	1244
R^2	0.2230	0.2189	0.2225	0.2170
Wald χ^2	734.69	6225.00	722.53	5955.27

Source: See text.

Notes: The dependent variable is the budget deficit-to-revenue ratio. The estimation technique is OLS with panel-corrected standard errors (PCSE). Z-statistics in absolute values are in parentheses. Columns (1)-(2) display the results of the basic econometric specification. Columns (3)-(4) display the results after lagging the start dates for limited government regimes by 10 years. Group 1: Austria-Hungary, England, France, the Netherlands, Prussia, and Spain. Group 2: Belgium, Denmark, Italy, Portugal, and Sweden. For additional details, see text.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 6. PMG Regression Results for Political Regimes and Fiscal Prudence

	(1) Group 1 Only	(2) Groups 1 & 2
Adjustment coefficient (Φ_i)	- 0.3668***	- 0.4312***
	(4.03)	(5.78)
Long-run coefficients (θ_i):		
Centralized and absolutist regimes	- 0.2401***	- 0.2002***
	(2.96)	(2.56)
Fragmented and limited regime	- 0.6609***	- 0.5710***
	(5.02)	(4.46)
Centralized and limited regimes	- 0.2012***	- 0.1673**
	(2.61)	(2.26)
Military deaths per year	- 0.000629	- 0.000672
	(1.47)	(1.60)
Enemy coalition population	0.0115***	0.0115***
	(6.26)	(6.24)
Mercenary	- 0.3816***	- 0.2838***
	(2.49)	(2.57)
Default	- 0.2671	- 0.2336
	(1.61)	(1.51)
Civil wars, coups, revolutions	0.4104***	0.3965***
	(3.83)	(3.84)
Urbanization rate	0.7920*	0.3620
	(1.80)	(1.08)
Gold standard	- 0.2792***	- 0.1151*
	(2.89)	(1.92)
Observations	929	1191
Maximum log likelihood	203.42	389.83

Source: See text.

Notes: The dependent variable is the yearly change in the budget deficit-to-revenue ratio. The estimation technique is the pooled mean group (PMG) model. Z-statistics in absolute values are in parentheses. Group 1: Austria-Hungary, England, France, the Netherlands, Prussia, and Spain. Group 2: Belgium, Denmark, Italy, Portugal, and Sweden. For additional details, see text.

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 7. Major Breaks in Budget Deficit-to-Revenue Series

	Year	Percent Change	Event
Austria-Hungary (1781-1910)	1810	- 58.50** (2.30)	End of Napoleonic Wars (1799-1815)
	1846	215.95*** (3.43)	Fiscal centralization (1848) / Year of Revolutions (1848)
	1889	- 71.43*** (5.69)	Nationalization of railways (1880s)
England (1692-1913)	1711	- 31.69 (0.55)	End of War of Spanish Succession (1701-1714)
	1737	762.71*** (3.25)	Start of War of Austrian Succession (1740-1748)
	1753	76.79 (1.32)	Start of Seven Years' War (1756-1763)
	1797	31.04 (0.68)	Start of Napoleonic Wars (1799-1815)
	1814	- 94.55*** (4.52)	End of Napoleonic Wars (1799-1815)
France (1815-1913)	1839	2726.90*** (3.41)	Reinforcements of 1840 during Conquest of Algeria (1830-1847)
	1854	- 71.90* (1.94)	Year of Revolutions (1848) / Coup by Napoleon III (1851)
	1870	-175.72 (0.72)	Limited government (1870) / Franco-Prussian War (1870-1871)
Netherlands (1815-1913)	1833	- 16.50 (1.55)	End of Belgian War of Independence (1830-1833)
	1850	- 36.83*** (4.53)	Limited government (1848) / Year of Revolutions (1848)
	1867	- 46.55*** (4.70)	Unidentified event
Spain (1849-1913)	1865	20.79 (0.12)	Start of Naval War with Peru (1865-1866)
	1880	- 68.35 (0.49)	Limited government (1876) / End of Third Carlist War (1872-1876)
	1898	- 215.59*** (3.90)	Spanish-American War (1898)

Sources: See text.

Notes: The first column lists the relevant Group 1 sample countries. The second column displays the years for the best three (Austria-Hungary, France, Netherlands, Spain) or five (England) structural breaks as determined by the algorithm described in the text. The third column reports the percentage change in average budget deficit-to-revenue ratios over the fifteen years following the break in question as compared to the fifteen years that preceded it. T-statistics in absolute values are in parentheses. The final column offers brief "explanations" for the turning points, which are elaborated upon in the text.
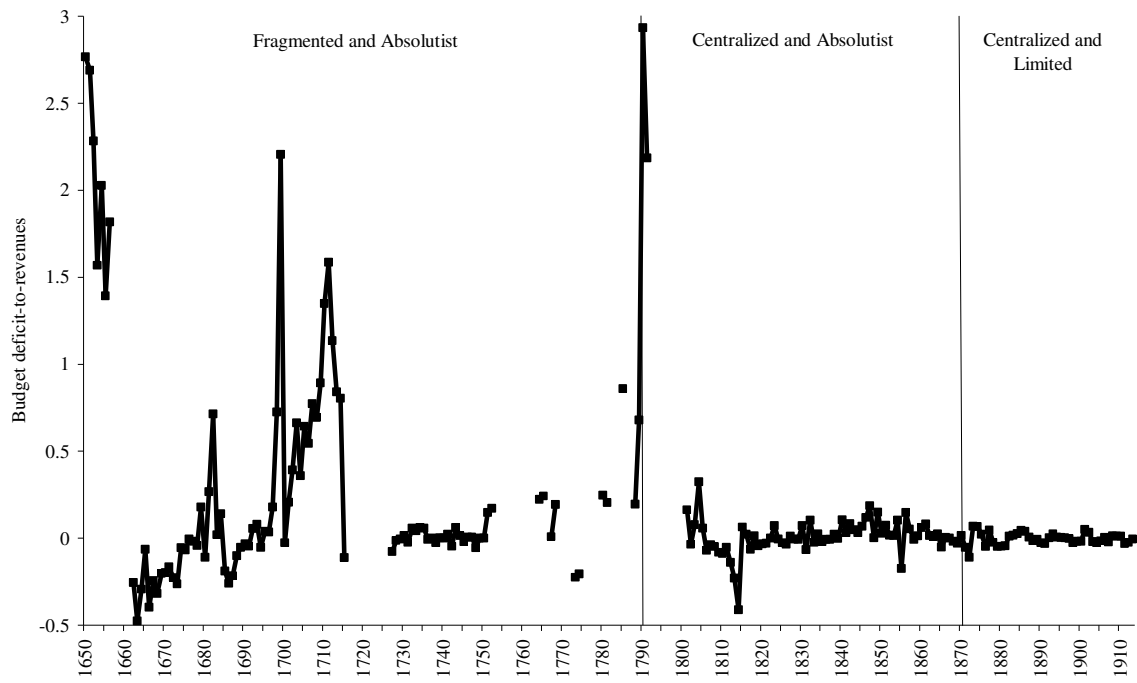
*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Figure 1. Budget Deficit-to-Revenue Ratios, England (Britain), 1692-1913
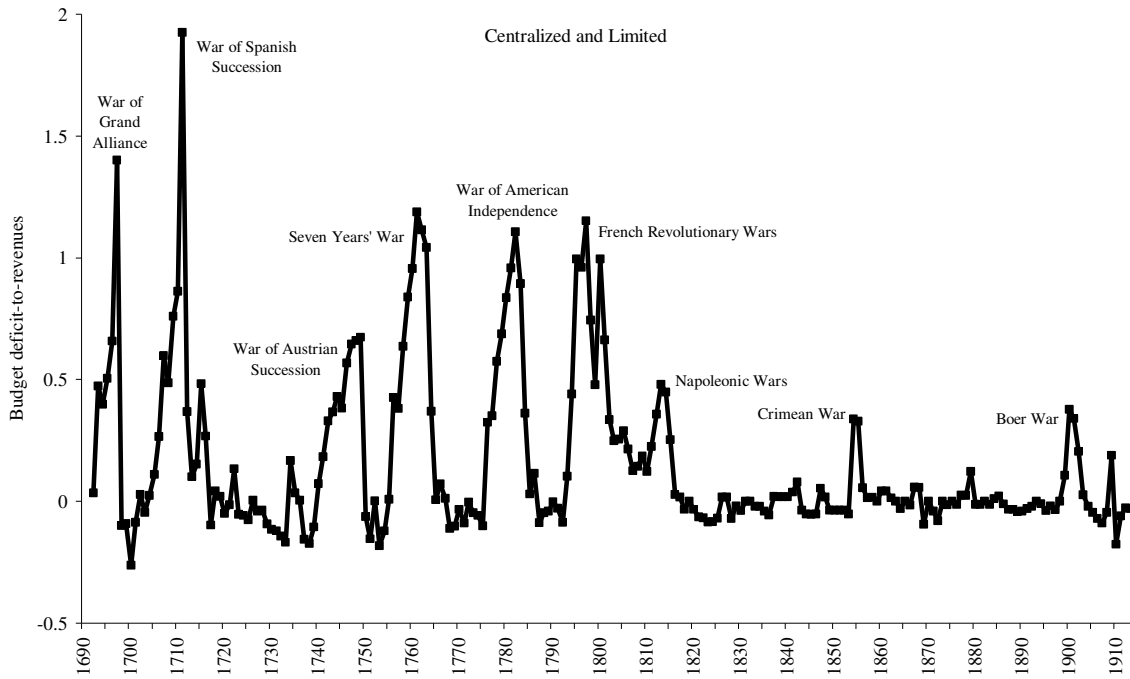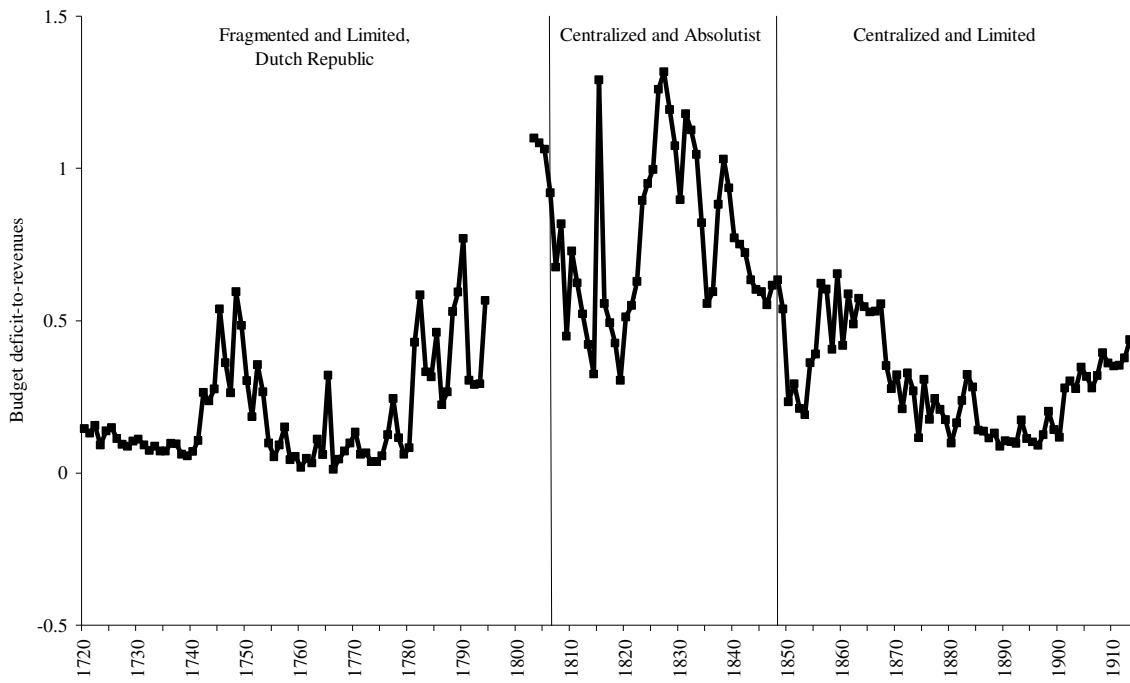

Sources: See Appendix A.

Figure 2. Budget Deficit-to-Revenue Ratios, France, 1650-1913
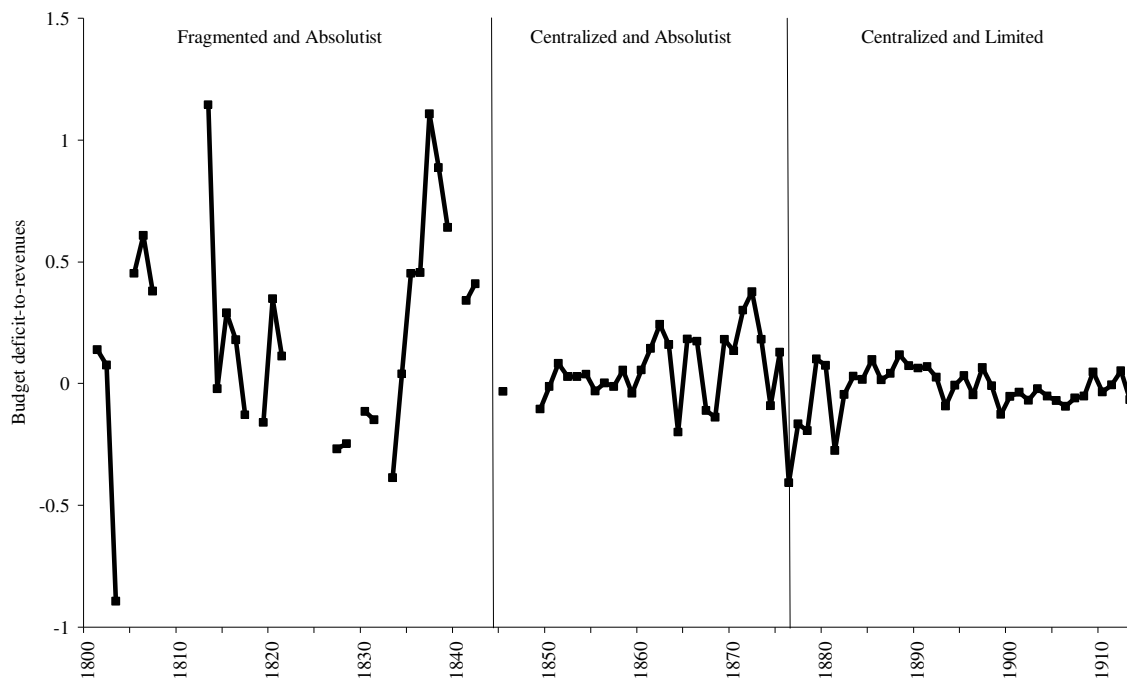

Sources: See Appendix A.

Figure 3. Budget Deficit-to-Revenue Ratios, Netherlands, 1720-1913
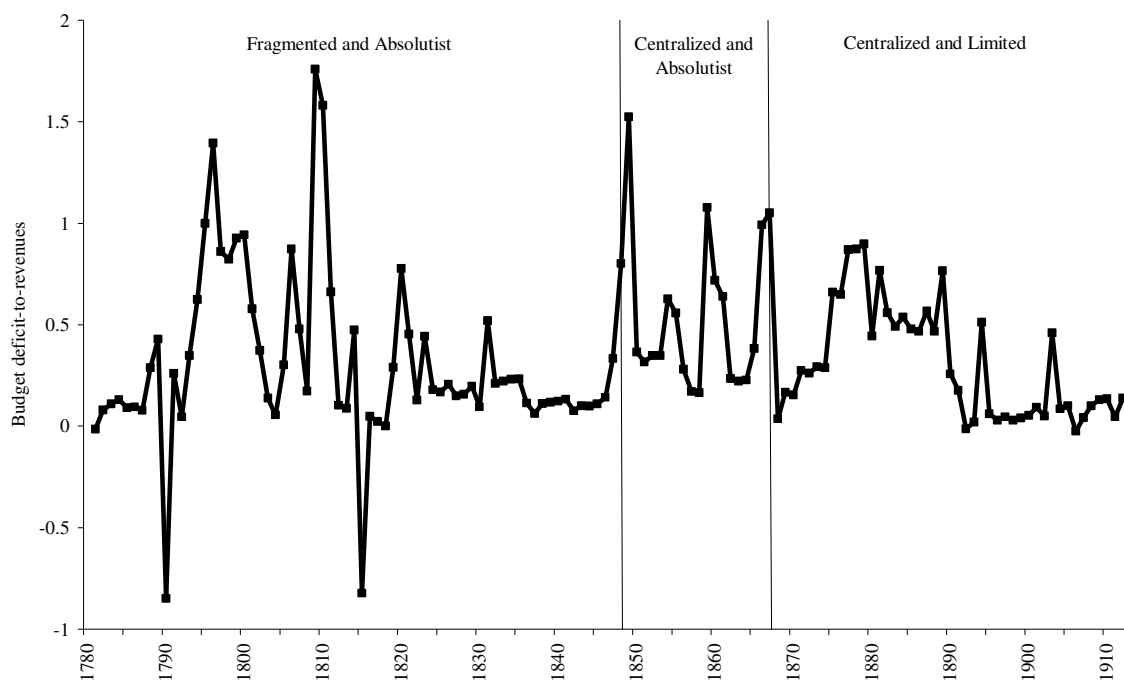

Sources: See Appendix A.

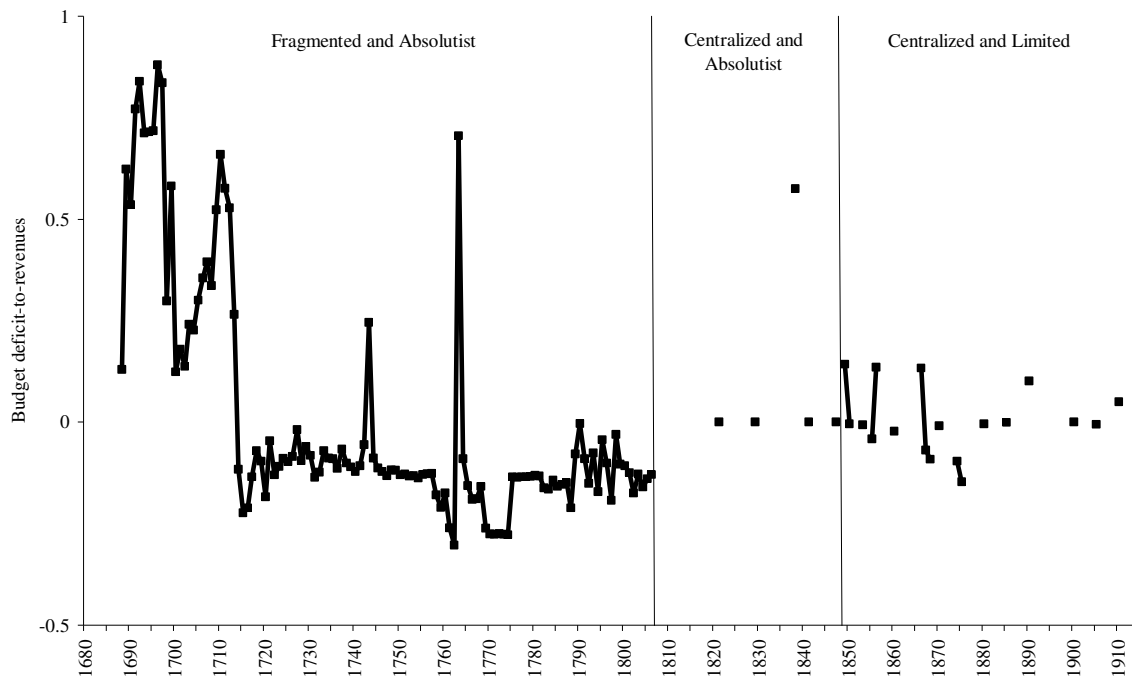Figure 4. Budget Deficit-to-Revenue Ratios, Spain, 1801-1913

Sources: See Appendix A.

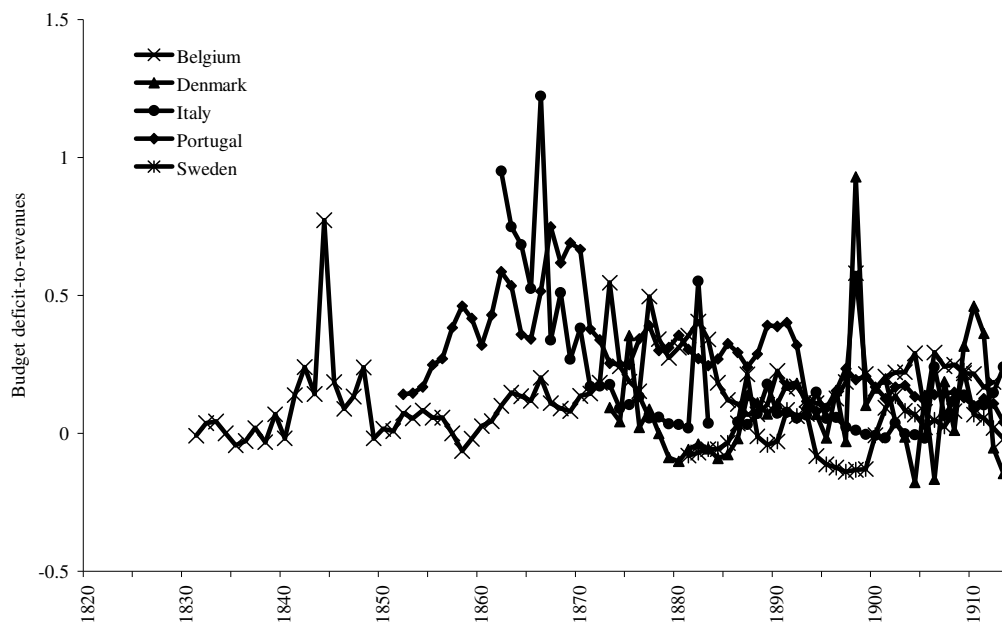Figure 5. Budget Deficit-to-Revenue Ratios, Austria-Hungary, 1781-1913

Figure 6. Budget Deficit-to-Revenue Ratios, Prussia, 1688-1913

Sources: See Appendix A.

Figure 7. Budget Deficit-to-Revenue Ratios, Group 2 Countries, 1820-1913

Sources: See Appendix A.