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Different Paths to the Modern State in Europe: The interaction between domestic political economy and interstate competition

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Abstract

Theoretical work on state formation and capacity has focused mostly on early modern Europe and on the experience of western European states during this period. While a number of European states monopolized domestic tax collection and achieved gains in state capacity during the early modern era, for others revenues stagnated or even declined, and these variations motivated alternative hypotheses for determinants of fiscal and state capacity. In this study we test the basic hypotheses in the existing literature making use of the large date set we have compiled for all of the leading states across the continent. We find strong empirical support for two prevailing threads in the literature, arguing respectively that interstate wars and changes in economic structure towards an urbanized economy had positive fiscal impact. Regarding the main point of contention in the theoretical literature, whether it was representative or authoritarian political regimes that facilitated the gains in fiscal capacity, we do not find conclusive evidence that one performed better than the other. Instead, the empirical evidence we have gathered lends supports to the hypothesis that when under pressure of war, the fiscal performance of representative regimes was better in the more urbanized-commercial economies and the fiscal performance of authoritarian regimes was better in rural-agrarian economies.

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Different Paths to the Modern State in Europe: The interaction between domestic political economy and interstate competition

1. Introduction

The process through which early modern European states monopolized tax collection and achieved gains in fiscal capacity has been at the centre of the study of state formation. What were the drivers of and the mechanisms for the consolidation of states' fiscal capacity? Did changes in economic structure and warfare play a role in state formation? Was it representative or authoritarian regimes that facilitated gains in fiscal and state capacity? These questions have been central not only to the study of politics[1], but also to understanding the economic development process.[2]

In investigating these questions, both theoretical and empirical literatures have mainly focused on evidence from early modern Europe, because it was states in Europe that were the first to permanently break cycles of gains and losses in centralized fiscal and coercive capacity and build towards the modern state system. In this article, we discuss and categorize the various threads in the theoretical literature, empirically investigate alternative hypotheses based on a new and comprehensive tax revenue dataset we have recently compiled, and find support for a formulation that emphasizes the interaction between domestic political economy and interstate competition.

[1] See Bonney (1999), Ertman (1997), Evans et. al. (1985), Finer (1997), Spruyt (2002), Storrs (2009), Tilly (1990), Vu (2010) and other works cited in the text.
[2] Epstein (2000), Acemoglu (2005), North et al. (2009), Besley and Persson (2010).

We begin by reviewing the long-term trends in fiscal capacity for eleven major European states during the early modern era. Specifically, we present figures for central treasury revenues in silver which can be viewed as the common monetary unit of account for the period and place them in the context of changes in population, prices and per capita incomes. The evidence corroborates a continent-wide trend of increase in centralized fiscal capacity that was significantly above and beyond the gains in average incomes. However, the patterns also suggest that not all states achieved fiscal gains, and among those that did, there were significant differences in the timing and extent of the gains.

To identify alternative explanations for these historical patterns and put them to test, we turn to theories of state formation in historical sociology and political science literatures. In the first stage of the analysis, we evaluate four hypotheses. Specifically, we discuss the arguments that posit changes in economic structure and warfare increased fiscal capacity, and the two hypotheses for political regime that alternatively posit that representative regimes performed better or worse than authoritarian regimes. The econometric evidence is consistent with positive impact of warfare and changes in economic structure, but does not conclusively lend support to a positive or negative impact for representation.

To address the theoretical and empirical ambiguity regarding the fiscal impact of political regime, in the second and third stage of the analysis we discuss and investigate finer hypotheses that emphasize the interaction of political regime with other determinants of fiscal capacity. The hypothesis that we find empirical support for is that for financing the main expenditure item, warfare, urbanization increased the effectiveness of and the prospect for taxation by seeking consent. This was so, because urbanization and commercialization altered the elite incentives and capability to seek centralized provision of national security and interstate warfare. Consequently, it was representative regimes in urbanized and authoritarian regimes in rural economies that tended to perform better in financing and transforming warfare into state building. Hence, political regime mattered, but in a contingent way.

These findings are consistent with a nuanced view of the state-building process. For the fiscal impact of political regime, they enable us to reconcile two distinct views. Whig history and more recently the New Institutionalist literature, building mainly on the Western European experience, have argued that representative regimes were more effective in responding to demands of intense early modern warfare, whereas studies that focus on Central and Eastern Europe have argued the opposite. We find that these arguments are not inconsistent, once the differences in the economic structure and elite incentives in the two regions are taken into account. Consequently, our findings explain why certain states with urban economies achieved state consolidation through representative regimes (e.g. urban England, the Dutch Republic), while others with rural economies did so through authoritarian regimes (e.g. rural Russia, Prussia), and yet others with rural economies and representative regimes collapsed under pressure of war (e.g. rural Polish-Lithuania, Kingdom of Hungary).

2. Revenue Patterns in Early Modern Europe

In this section we first describe the tax revenue dataset we have compiled for leading European states. We then provide an overview of patterns in total tax revenues and per capita tax revenues during the early modern period based on this data set. Lastly, we discuss the figures for per capita tax revenues divided by per capita incomes, widely employed in the empirical literature as the proxy for state capacity.[3] We establish that the patterns for this last measure are consistent with continent-wide gains in centralized fiscal and state capacity during the early modern era.

For this study, we have compiled annual central treasury tax revenue figures for England, France, the Dutch Republic, Spain, Venice, Austrian Habsburgs, Prussia, Russia, Sweden, Polish-Lithuanian Commonwealth and the Ottoman Empire, from the early part of the sixteenth century until the end of the eighteenth century and

[3] Hendrix (2010), Lieberman (2002).

then until World War I. We have converted all monetary magnitudes into tons of silver by multiplying the annual magnitudes in the current monetary units of account in each polity with the silver content of the unit of account for that year. We have taken great care to apply similar definitions of revenue to all the states, but the limitations imposed by the variations in accounting procedures and fiscal structures should be kept in mind.

Figure 1: Annual Revenues of European States, 50-year averages in tons of silver

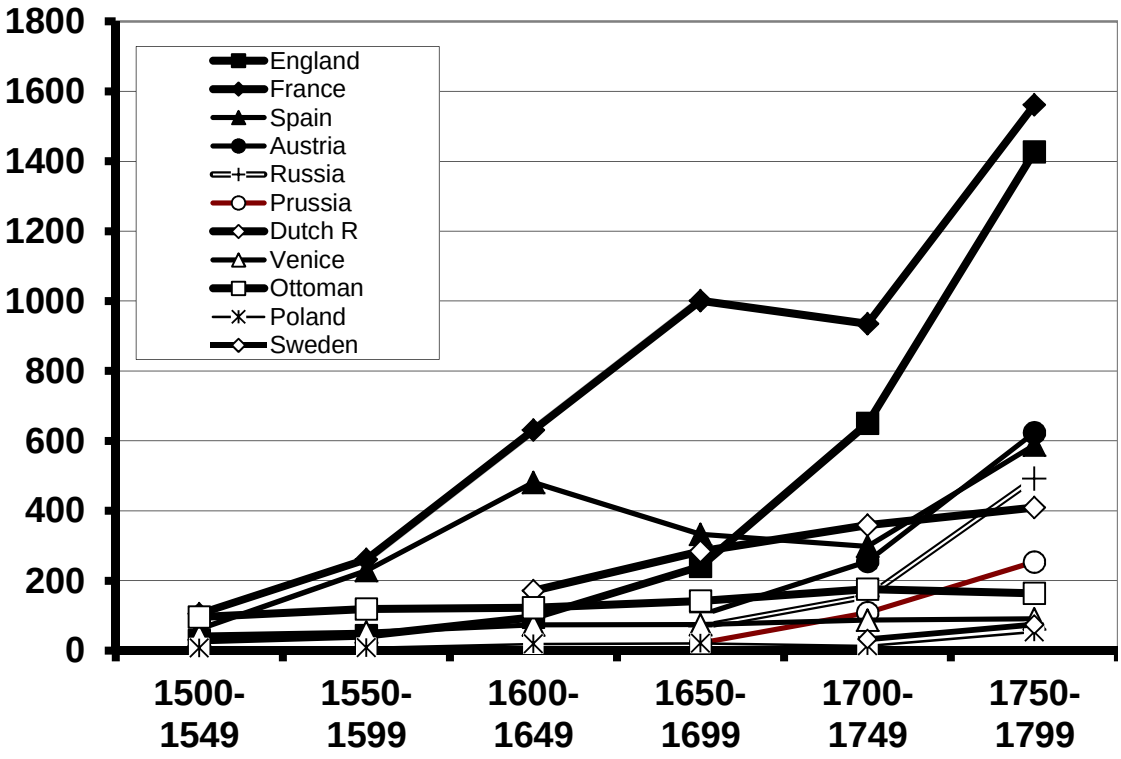

Figure 1 presents 50–year averages of annual total central treasury revenues of the leading European states during the early modern era. It makes clear that central treasury revenues of most European states increased sharply during the seventeenth and especially the eighteenth centuries and these revenue patterns are consistent with the historical shifts in the interstate power balance. Most striking in this respect was England where total revenues of the central administration, in tons of silver, increased by more than 40 times between the middle of the sixteenth century and the end of the eighteenth century. In France, total revenues of the central administration increased by more than 12 times. In the Dutch Republic, total revenues began at a

much higher level and increased by 4 times. Outside Western Europe, revenues of some but not all states also showed significant increases. In Austria, total revenues increased by 12 times from the middle of the seventeenth century until the end of the eighteenth century. In Russia further to the east, total central revenues rose by more than 8 times. Interstate differences in total revenue figures reached their peak during the second half of the eighteenth century when the revenues not only of the more successful and more powerful states in Western Europe but also of those in central and Eastern Europe such as Austrian Monarchy and Russia showed their most rapid increases.

> **Equation 1**: Total Tax Revenues in Tons of Silver = Population * Price Level * Real Income Per Capita * Real Tax Revenues Per Capita as a per cent of Real Income Per Capita

As Equation 1 makes clear, changes in total tax revenues were not necessarily driven by gains in state capacity. In particular, it is possible to distinguish between the changes in total revenues due to changes in socioeconomic variables (i.e. population, price level and real income per capita) and changes in state capacity, as measured by the tax revenues over income ratio.

Figure 2: Annual Revenues per capita, 50-year averages in grams of silver

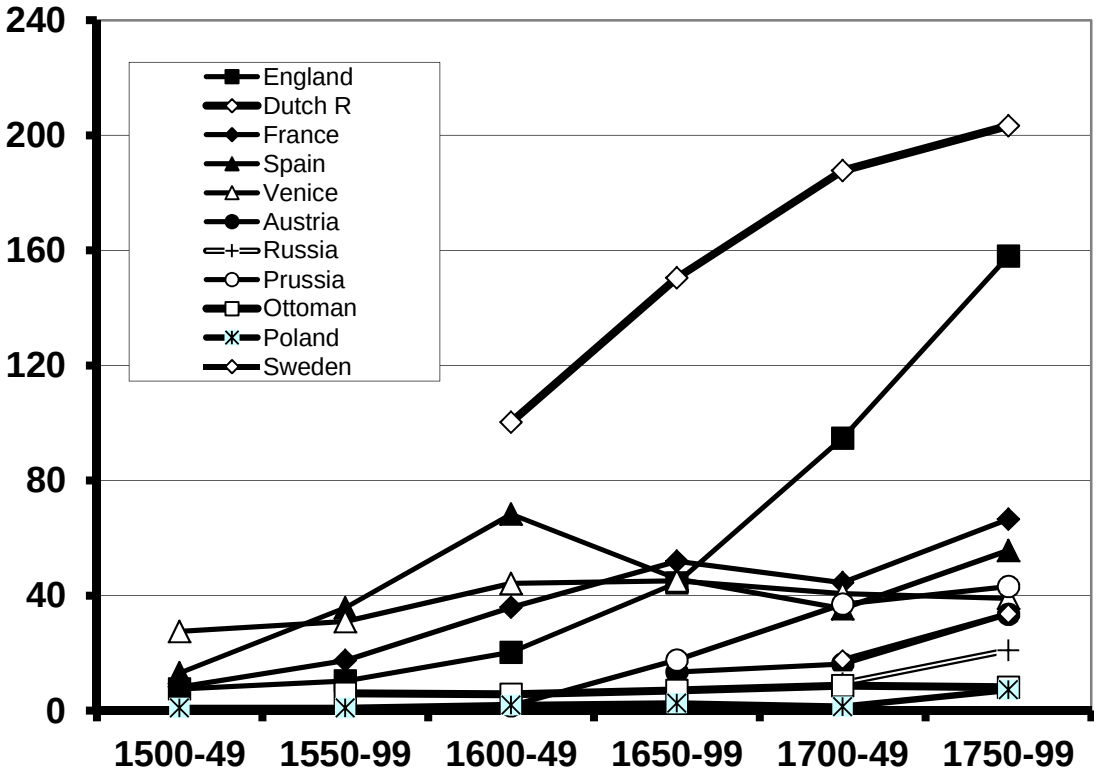

Figure 2 presents the averages for central per capita tax revenues in grams of silver.[4] Adjusting for population and population growth alters the cross-polity rankings. Small, urbanized polities such as England, the Dutch Republic and Venice fare better in per capita terms. However, the trend of gains in taxation over time is still robust for most polities. For England, per capita revenues, in grams of silver, increased by more than 20 times from the middle of the sixteenth century to the end of the eighteenth century. In France, per capita revenues increased by 7 times during the same period. In the Dutch Republic, per capita revenues increased by 3 times from the beginning of the seventeenth until the end of the eighteenth century. In Austria and Russia, per capita revenues increased by 4 and 2 times respectively during the eighteenth century.

Lastly, to control for changes in price level in silver and average real incomes, we divide the annual per capita central tax revenues in silver by the daily wages of

[4] Populations of most but not all European states in our sample increased during the early modern era, mainly for Northwestern Europe, and, with a lag, for Eastern Europe. See McEvedy and Jones (1978).

unskilled workers in silver. [5] There were significant variations across polities and over time in price levels in silver and in real incomes during the early modern era.[6] The daily wages of unskilled urban workers in grams of silver capture the changes in both, are available annually for most polities and in the absence of reliable estimates for per capita income, are frequently used by economic historians as a proxy for per capita income for this period. [7]

Figure 3: Annual Revenue per capita / Daily Urban Wage, 50-year averages

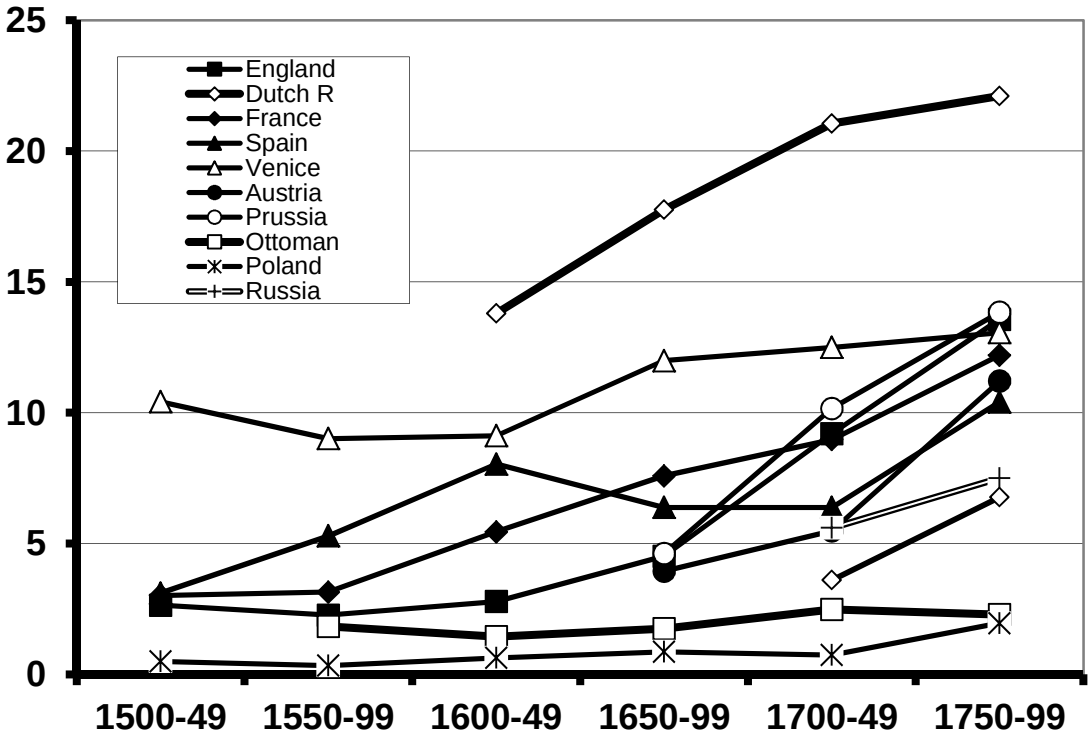

Figure 3 presents per capita tax revenues in days of unskilled workers' wages, our proxy for state capacity. It makes clear that, except for Poland-Lithuania and the

[5] Allen (2001), Özmucur and Pamuk (2002).
[6] In the early part of the early modern era, price levels were higher in southern Europe than the rest of the continent. During the early modern centuries, however, price levels in northwestern and more generally western Europe increased more rapidly, by as much as 4 fold as rising incomes and wages tended to pull up the prices of services and other non-tradable goods. There emerged, as a result, significant differences in the price levels between western Europe and the rest of the continent by the second half of the eighteenth century. Incomes rose rapidly in England and the Dutch Republic during the seventeenth and eighteenth centuries. In contrast, recent findings suggest that per capita GDP in the rest of the continent did not show any strong trend during the early modern era, rising to some extent in Western Europe but probably declining in southern Europe, especially in Italy. See Van Zanden (2000), Alvarez-Nogal and de la Escosura (2007), Maddison (2007).
[7] For example, Allen (2001) and Van Zanden and Prak (2006).

Ottomans, there was a strong pattern of gains in state capacity across Europe during the early modern centuries. Figure 3 also indicates that gains in centralized state capacity proceeded quite unevenly across the continent. During the first half of the sixteenth century, annual tax revenues per capita did not exceed 5 days of unskilled urban wages in most European countries. The only exceptions were the small and highly urbanized entities such as Venice and Holland. By the end of the eighteenth century, however, differences in fiscal centralization across Europe had increased substantially. While the annual per capita revenues of some central administrations such as Poland-Lithuania and the Ottoman Empire still remained below 5 days of urban wages, many others had reached the 10 to 15 daily wages range and annual per capita revenues of the central administration in the Dutch Republic exceeded 20 days of urban wages. It is worth noting that the middle group where annual per capita revenues reached 10 to 15 daily wages included not only the more urbanized western European countries such as England, France, Spain and Venice but also the more rural and agricultural countries in central and eastern Europe such as Austria and.[8] These broad trends make clear that the increases in the fiscal capabilities of centralized administrations preceded the Industrial Revolution and the onset of modern economic growth in the 19th century.

[8] In controlling for changes in per capita incomes, an alternative approach would be to divide per capita tax revenues by per capita GDP figures. The trends we identified are robust for this alternative measure for state capacity. We estimate that tax revenues of the central administrations as a per cent of GDP rose in most European countries from less than 5 per cent in the sixteenth century to a range between 5 and 10 per cent and in a small number of cases that include Britain and the Netherlands to more than 10 per cent by the end of the eighteenth century. See, for example, P. K. O'Brien and Hunt (1993). We prefer to work with wages rather than per capita GDP figures since the quality of the existing GDP estimates for the early modern era are not very good and they are available only for some benchmark years.

3. Theories of State Formation in Early Modern Europe

The long term trends we reviewed in the previous section indicate that state revenues increased more rapidly than taxable resources and state capacity grew faster than the economy in early modern Europe. These findings raise questions about the basic causes of this broad trend. To investigate the issue, we provide below first a framework for analysing the domestic political bargain over taxation during the early modern era and then summarize the main arguments in historical sociology and political science literatures that aim to explain the rise in centralized state capacity.

One critical observation for understanding the rise of states in early modern Europe is that they were the outcome of bargains between central administrations and domestic elites over the mobilization and use of domestic economic resources. Until the 19th century, the primary activity of the central administrations, which were often, but necessarily, controlled by a ruler, was extracting economic resources through taxation and spending them for the upkeep of the coercive apparatus. Both in mobilizing resources and maintaining the coercive apparatus, rulers fostered relationships with domestic elites that were *de facto* and *de jure* distinct from the royal apparatus. More specifically, in assessing, collecting and spending taxes and in the provisioning and command of the coercive apparatus, rulers worked with domestic elites as vassals, functionaries, officials, corporations, councils, tax farmers. However, incentives of the rulers and elites were only partly aligned in these relationships. While complementary competencies or mutual interests against rival states drove the alignment, the relationships also had a redistributive conflict dimension, since each party ultimately attempted to maximize his share in the final allocation of economy's mobilized resources.[9] The degree of alignment and conflict in interests, and the leverages of political actors in the redistributive dimension of the relationships differed from one polity to another and in different periods.

[9] Karaman (2009), Kiser (1986-87), Lachmann (2000), Volckart (2000).

In explaining how the nature of the intra-elite bargain that characterized the state apparatus changed and gains in centralized fiscal capacity occurred, a major thread in the literature identifies the changes in economic structure through the early modern era as the prime mover. In these explanations, state figures chiefly as an instrument of domestic elites and it is argued that changes in the structure of domestic economy induced the decomposition of the feudal state and realigned societal forces towards a centralized state apparatus.[10] At the heart of this argument lies the notion that urbanization, rise of domestic and international overseas trade and increasing commercialization of the factors of production and taxable resources, namely land, labour and capital, favoured centralized control over coercion and provisioning of public goods. For example, in his discussion of Western Europe, Anderson argues that the rise of centralized monarchies in early modern period was due to the reorganization of aristocratic power to retain its privileged position in a more centralized fashion.[11] According to this argument, the decomposition of feudalism, and the rise of towns and markets undermined the aristocracy's coercion based extractive capacity at the village level. Their role was taken on by the rising monarchies, which then served to mobilize resources at the scale of newly forming nations. Similarly, Wallerstein argues the rise of strong states in Europe occurred concurrently with early stages of capitalism. In the "core" areas, the richer and more complex societies facilitated more differentiated and effective states.[12] Formally:

> **H1**: Urbanization, which was at the nexus of changes in economic structure, had a positive impact on centralized fiscal capacity.

A second line of argument emphasizes the role played by interstate warfare and competition in driving the gains in centralized fiscal capacity.[13] At the core of this argument is the claim that interstate warfare of the early modern era set in motion innovations in military technology, training, and tactics that favored centralized

[10] Gourevitch (1978).

[11] Anderson (1979).

[12] Wallerstein (1974).

[13] Ames and Rapp (1977), Bean (1973), Besley and Persson (2008), Peacock and Wiseman (1961), Rasler and Thomson (1985), Rasler and Thomson (1999), Tilly (1990). For extensions of the argument to the modern period, see Centeno (2002) for Latin America, Lustick (1997) for the Middle East and Herbst (2000) for Sub-Saharan Africa.

modes of coercive organization and demanded standing armies of ever greater size and cost. In turn, the pressure to provision and manage these armies induced experimentation and advances in fiscal, military and administrative methods and these gains formed the backbone of the modern state.[14] These changes were ad hoc responses to exigencies of warfare and thus gains were often piecemeal and limited. In Europe, however, the existence of multiple core agricultural areas, large islands and mountain ranges that divide up the continent facilitated a fragmented state system, more or less continuous warfare and ensured that the gains accumulated over time.[15] In its most basic formulation, the above considerations suggest the following hypothesis:

> **H2**: Interstate warfare and competition had a positive impact on centralized fiscal capacity.

As for the investigation of the impact of political regime, the focus is on characterizing the ruler and his administrative apparatus' relationship with the domestic elites, as until the 19th century politics was an intra-elite game that excluded the masses. For this relationship, we identify the relevant theoretical distinction as between representative regimes, where the bargain between ruler and elites was collective and formal, and authoritarian regimes, where it was bilateral and particularistic. Specifically, an inclusive representative assembly of domestic elites provided a venue for information sharing, intra-elite coordination, and sanctioning of deviant members. This, in turn, increased the capacity of elites to formulate policies separate from the ruler, solve collective action problems and credibly act in unison. [16] In the longer run, the existence of an assembly also enhanced elite competencies by allowing for an autonomous organizational structure and paved the way for organizational innovations. The contrast is with authoritarian regimes, where the domestic bargain was between the ruler and individuals or particular elite

[14] Hintze (1975).

[15] In contrast, in East Asia, where warfare was episodic and the gains in military technology and organization during episodes of war were followed by stagnation and decay during long episodes of peace. See McNeill (1982) and Morillo (1995).

[16] See Greif et. al. (1994) for a theoretical analysis of the impact of coordination and commitment capacity of sides to a bargain on the bargaining outcomes.

groups, the arrangements were often informal and the ruler retained the capacity to reward, punish and play elites against each other.[17] Consequently, in authoritarian regimes, the elites lacked sophisticated organizational forms to formulate policies and credibly coordinate on actions other than those formulated by rulers.

Based on this distinction, there are conflicting hypotheses regarding the relative fiscal performances of authoritarian and representative regimes.[18] One line of argument contends that authoritarian regimes were more effective in raising revenues. The premise of this argument is that domestic extraction and allocation of resources ultimately rested on compulsion through force, and not on consent. Authoritarian regimes, due to absence of coordinated resistance, were better able to pass laws that broadened the tax net, compel interest groups to behave in ways that countered their interests and suppress their activities to obtain exemptions and favors. For early modern Europe, this line of argument invokes the experiences of continental European polities including Poland-Lithuania, Austrian Habsburgs and Prussia, characterizes representative bodies in these polities as nodes of resistance against fiscal centralization, and posits a causal link between the degree to which rulers reigned in on their prerogatives and the gains in fiscal capacity. This implies the following hypothesis:

> **H3**: Representative regime had a negative impact on centralized fiscal capacity.

On the other hand, those who argue that representative regimes had a positive effect on tax revenues focus on the role of consent in reducing the costs of compliance. [19] In this tradition, what limited the ruler's tax extraction capacity was taxpayers' ability to withhold payments and increase costs of collection. Accordingly, representative regimes solved collective action and free-rider problems among the taxpayers, permitted better transmission of information, reduced costs of negotiation, measurement and monitoring, lent legitimacy to taxation and allowed credible commitment. As cases to the point, this line of argument invokes the representative

[17] See, among others, Hellie (2000) for Russia, Barkey (1994) for the Ottomans,
[18] Cheibub (1998).
[19] North (1981), Levi (1988), Dincecco (2009).

regimes and fiscal successes of the Dutch Republic and England after Glorious Revolution and compares them favourably with the authoritarian regimes and fiscal demise of Spain and France.[20] Formally:

> **H4**: Representative regime had a positive impact on centralized fiscal capacity.

4. Testing the Theories

The theories for gains in state capacity, outlined in the preceding section, have been put to test in a number of empirical studies.[21] The predominant approach in this literature has been to introduce a proxy for the conjectured cause of gains in fiscal capacity and evaluate its impact. In the first stage of our analysis, we adopt a similar but more comprehensive approach both in terms of methodology and data. Since our goal is to identify the independent contribution of the three conjectured determinants, we treat them symmetrically and estimate their impacts simultaneously. As for the data, we employ the dataset that we have compiled covering the nine Great Powers for Early Modern era as identified by Levy (1982) and Venice through the early modern period. In the rest of this section, we describe the dataset, the variables, the econometric models employed, and present the first stage of our results.

[20] Hoffman and Norberg (1994).

[21] Among others, Rasler and Thompson (1985) and (1999) test impact of wars for revenue series of Britain starting 1700, France after 1815, the US after 1792 and Japan after 1878 and find that global wars had a transformative impact. Dincecco (2009) constructs revenue series mainly for Western European countries after 1650 and finds that the introduction of constraints on the executive had a positive impact on tax revenues per capita. Thies (2005) shows a positive relationship between interstate rivalry and tax revenues for 19th century Latin America. Cheibub (1998), Ross (2004), Timmons (2005) investigate the impact of political regime and Lektzian (2008) and Thies (2007) the impact of interstate competition on tax revenues based on 20th century data.

Data and Variables

We investigate below the determinants of the centralized taxation capacity for between1500-1799. We use decennial averages of both the dependent and independent variables in order to compensate for the quality of data and not artificially inflate the significance of the regression results. Due to quality of data and missing data for one or more variables certain periods and countries drop out of the sample.[22] Coupled with econometric requirements, the available number of observations ranges between 120-179 depending on the particular model we estimate.

The dependent variable is log decade average of per capita tax revenues divided by decade average of wages (logPctrw). As discussed in section 2, tax revenues per capita, adjusted for measures of income, is the most common proxy for state capacity in the empirical literature. This is so, because the share of a polity's resources collected as taxes by the central administration measures both its extractive capacity and the limits of the policies it can implement.

Economic structure argument (H1) posits that rise of domestic and international trade, sectoral shifts, commodification of labor and monetization altered domestic organization of finances and coercion. Since urbanization was at the nexus of these economic changes**,** our main proxy is urbanization rates from de Vries (1984). De Vries provides the most detailed data for the period, available for each half century. In different regressions, we employ interpolated urbanization rates for each decade (Urbdec) or half century averages (Urbhc).

To investigate the impact of interstate warfare on fiscal capacity (H2), we construct two proxies for war pressure. The main proxy, distance weighted pressure of war (Dwpwar), takes into account the ratio of the total causality due to war to total population of the belligerents, the coalitions of belligerents and the distance matrix

[22] We exclude Poland-Lithuania due to time consistency issues for the items included in the tax revenue series. For France, the last decade of 18th century drops out due to monetary fluctuations and measurement issues for revenues. For Austria and Prussia, the observations for respectively 1700-1739 and 1610-1659 are excluded because of the measurement issues for population due to rapid territorial gains and losses.

between the capital cities of the belligerents. The alternative proxy, pressure of war (Pwar) is similar except that it does not take the distance matrix into account.[23]

To investigate the impact of political regime on fiscal capacity (H3 and H4), we employ two different proxies for representativeness of regime coded by different authors. Our main proxy is an index of the activity of parliaments (Parl) by Bosker, Buringh and Van Zanden (2011), rescaled to vary between 0 and 1. The second (Ctax) is constructed by Stasavage (2010) and takes the value 1 if there is a representative assembly in a polity with the prerogative to consent to taxation at a given decade and 0 otherwise. For both proxies, a higher score corresponds to a higher level of political representation.

In all specifications, we added fixed effects for each polity and each decade. The polity fixed effects allow controlling for any omitted polity specific effects that do not vary over time, such as geofigureical attributes and any time persistent differences in the conventions used for recording tax revenues. The decade fixed effects allow controlling for omitted common shocks and trends such as gains in transportation, communication, information technologies. Hence, the regression results are driven by the variation the explanatory variables exhibit for each polity over time after controlling for continent-wide trends.

In various econometric specifications, we include log population density (logPopdens) and log silver wages (logNomwage) as control variables. We do so to control for the possibility that a change in either of these variables may lead to a more or less than proportional change in per capita tax revenues.[24] We also include

[23] See the appendix for details.

[24] The literature is ambiguous on whether an increase in population density necessitates additional layers of government, increases transaction costs and thus decreases per capita tax collection or whether it induces economies of scale in tax collection and increases it. On the expense side, since the largest item, national defense, exhibits economies of scale, a growing population may have a negative effect on per capita burden. As for an increase in average wage, since incomes were close to subsistence level during the early modern era, it may lead to more than proportional increases in per capita revenues.

log book production per capita[25] (logBookprod) as a regressor, to control for the impact of changes in human capital on state capacity.

Econometric Model and Empirical Analysis

Our base econometric specification is OLS with polity and decade fixed effects and panel corrected standard errors. We assume that the disturbances are heteroscedastic across panels, there is a common autocorrelation term for all panels and no contemporaneous correlation across panels. The last two assumptions are appropriate and necessary, because the gaps in the data reduce the number of consecutive observations for each polity and common period effects are controlled for by decade dummies. The equation we estimate is:

$$r_{it} = \alpha_i + \beta_t + X_{it}'\gamma + \theta_1 Urb_{it} + \theta_2 War_{it} + \theta_3 Repr_{it} + \varepsilon_{it}$$

where r_{it} is log of per capita tax revenue over wage ratio for polity i in period t, and α_i and β_t are polity and period fixed effects, $X_{it}'$are control variables. ForUrb_{it}, urbanization rate, War_{it}, the pressure of warfare and $Repr_{it}$, the representativeness of political regime, we employ different proxies in different specifications. ε_{it} is the disturbance term that exhibits heteroskedasticity and autocorrelation.

Table 1 reports the first set of regression results. In all 6 specifications, the dependent variable is log per capita tax revenue over wage ratio (logPctrw). In specification 1, urbanization rate for each decade (Urbdec), distance weighted pressure of war (Dwpwar), the index for activity of parliaments (Parl), the full set of polity dummies and decade dummies except for 1500-09 are included as regressors. In specification 2, control variables lagged log population density (L.logPopdens) lagged log nominal wages of urban construction of workers (L.logNomwage) and log per capita book production (logBookprod) are also included as regressors. In specification 3, alternative proxies for theories of state formation are employed: half century

[25] The figures are based on Babinger (2004), Beydilli (1995) and Kut (1996) for the Ottomans and Baten and Van Zanden (2008) for other polities.

averages of urbanization rates (Urbhc), war pressure that is not distance weighted (Pwar) and existence of an assembly with prerogatives over taxation (Ctax). Specification 4 is similar to specification 3 except that additional control variables are included as regressors. In specification 5, we drop England from the sample. We do so because our proxies for war pressure do not account for the fact that England was an island and hence they may overstate the pressure. In specification 6 we drop Prussia, Sweden and Russia from the sample to alleviate two concerns. For these polities revenue series are available starting from later 17th or early 18th century, and if the late availability of revenue series was due to variables other than those we include in our estimations, this would cause a selection bias. Secondly, the implicit assumption in our empirical framework is that the impact of war pressure was quantitatively the same across different polities and periods. It could be argued, however, that for these latecomers war pressure had a greater impact, because by the time the war pressure levels began to rise in peripheral regions of Europe, they had access to a greater accumulated body of military and fiscal knowledge to draw on. The reported estimates for L.logPopdens and L.logNomwage, which enter the regression in log form, are elasticities. For the other regressors, we report semi-elasticities.

TABLE 1: Baseline Regressions

DETERMINANTS OF LOG PER CAPITA TAX REVENUE (IN DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat. OLS with PCSE					
	Full Sample				Excl. England	Excl.Sweden Russia Prussia
	(1) Urb.: Urbdec War:Dwpwar Repr.: Parl	(2) Urb.: Urbdec War:Dwpwar Repr.: Parl	(3) Urb.: Urbhc War:Pwar Repr.: Ctax	(4) Urb.: Urbhc War:Pwar Repr.:Ctax	(5) Urb.: Urbdec War:Dwpwar Repr.: Parl	(6) Urb.: Urbdec War:Dwpwar Repr.: Parl
Urbanization	8.126****	7.906****	8.035****	7.964****	8.345****	8.196****
	(1.294)	(1.420)	(1.222)	(1.383)	(1.623)	(1.279)
War Pressure	0.484****	0.451***	0.180*	0.180*	0.525***	0.374**
	(0.136)	(0.139)	(0.099)	(0.102)	(0.182)	(0.153)
Representation	-0.193	-0.076	0.029	0.177	-0.166	-0.171
	(0.224)	(0.234)	(0.149)	(0.146)	(0.241)	(0.225)
Lag. Log Nom. Wage		-0.156		-0.217*		
		(0.122)		(0.123)		
Lag. Log Pop. Density		0.061		0.074		
		(0.048)		(0.053)		
Log Book Prod.		0.005		0.029		
		(0.063)		(0.066)		
Observations	179	173	179	179	149	150
R2	0.840	0.854	0.838	0.841	0.850	0.857

Standard errors in paranthesis
Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001
Estimated using Stata xtpcse procedure, with two-way fixed effects and c(ar1) and hetonly options

The empirical findings are consistent across these 6 specifications. Proxies for urbanization are significant at 0.1 per cent. This finding is robust when nominal wage is included as regressor, despite the fact that wage captures similar trends, is available for each decade and thus less subject to measurement errors than urbanization. The evidence also suggests the impact of urbanization (H1) is substantial. To get a sense of the magnitudes involved, consider specification 1. All else being equal, it is estimated that a one per cent increase in urbanization rate led to 8.126 log points or roughly 8.5 per cent increase in per capita tax over wage ratios.

Likewise, we find strong support for positive impact of wars on centralized fiscal capacity (H2), significant at 10 per cent or higher levels. Both the significance levels and the estimated magnitude of impact is greater when the distance weighted proxy for war pressure (Dwpwar) is employed. To give an idea of the size of the impact, for specification 1, one per cent increase in distance weighted pressure of war has an estimated impact of 0.484 log points or 0.49 per cent on the dependent variable. This arguably is a lower limit on wars' impact on state building, since the econometric specification only accounts for an instantaneous and polity specific effect. However, many of the wars in the sample involved a large number of polities, and any

innovations due to war were transferred and adopted across the continent.[26] Such continent-wide impacts are soaked up by decade dummies.[27]

Lastly, for representation, we do not find evidence of a negative (H3) or a positive (H4) impact. In particular, the estimated coefficient carries a negative sign in four and positive sign in two specifications, and is insignificant at 10 per cent level in all.[28]

Alternative Econometric Specifications

In the econometric models summarized in Table 1, the persistence of fiscal capacity from one decade to the next is accounted by a serial correlation in the error term. An alternative approach would be to model it by including the lagged value of the dependent variable as a regressor. There are two main econometric models for doing so. The first of these is Ordinary Least Squares (OLS) with lagged dependent variable, two-way fixed effects and panel corrected standard errors. Specifically, the regression equation is:

$$r_{it} = r_{it-1} + \alpha_i + \beta_t + X_{it}'\gamma + \theta_1 Urb_{it} + \theta_2 War_{it} + \theta_3 Repr_{it} + \varepsilon_{it}$$

where r_{it-1} is the log of per capita tax revenue over wage ratio for polity i in t-1 and ε_{it} is the disturbance term that exhibits heteroskedasticity. The second model is Arellano Bond difference GMM with orthogonal deviations and lagged dependent variable. Since most countries in our sample have a large number of periods, Arellano Bond estimation is considered less appropriate here, but we also report the results for it.[29]

[26] See, for example, Lynn (1985).

[27] Consistent with the argument, the estimates of decade dummies in all specifications, not reported for lack of space, identify a trend of increase.

[28] These regression results are robust to employing different subsets and combinations of the proxies for the theories of state formation and the control variables as regressors, not reported here for the sake of brevity. We also tried controlling for changes in average income by including real wage as opposed to nominal wage as a regressor and the regression results were similar.

[29] When fixed effects and lagged dependent variable are both included in the OLS regression, lagged dependent variable is correlated with the error term, and this creates a downward bias in the coefficient (Nickell 1981). However, as number of periods increase, dynamic panel bias gets smaller and OLS is more efficient than IV estimation. Arellano Bond is unbiased, and also permits

Table 2 presents findings consistent with the baseline specification. Specifications 1-4 and 5-6 are respectively dynamic OLS and Arellano Bond estimation results for different proxies of urbanization, war pressure and representation. In all, urbanization and war pressure have positive and significant impacts. Representation has a positive coefficient and is marginally significant at 10 per cent level in specification 5, and is insignificant for the other five specifications.

TABLE 2: Dynamic Regressions with LDV

DETERMINANTS OF PER CAPITA TAX REVENUE (IN LOG DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat.					
	OLS with PCSE				Arellano Bond Dynamic Estimator	
	(1)	(2)	(3)	(4)	(5)	(6)
	Urb.: Urbdec War:Dwpwar Repr.: Parl	Urb.: Urbdec War:Pwar Repr.: Parl	Urb.: Urbhc War:Pwar Repr.: Ctax	Urb.: Urbhc War:Pwar Repr.: Ctax	Urb.: Urbdec War:Pwar Repr.: Parl	Urb.: Urbhc War:Pwar Repr.: Ctax
Lag. Log Per Cap. Tax Wage Rat.	0.514****	0.499****	0.537****	0.511****	0.612****	0.658****
	(0.066)	(0.070)	(0.065)	(0.071)	(0.071)	(0.057)
Urbanization	3.143***	2.831**	2.941****	2.886**	1.598***	2.197***
	(1.055)	(1.268)	(0.877)	(1.219)	(0.604)	(0.700)
War Pressure	0.394***	0.390***	0.224**	0.219**	0.439****	0.240***
	(0.137)	(0.138)	(0.100)	(0.099)	(0.129)	(0.088)
Representation	-0.031	-0.014	0.087	0.101	0.110*	0.038
	(0.160)	(0.178)	(0.101)	(0.112)	(0.064)	(0.052)
Observations	143	143	143	143	120	120
R2	0.954	0.954	0.952	0.953		
ar1					-1.632	-1.600
ar1p					0.103	0.110
ar2					0.659	0.639
ar2p					0.510	0.523
Controls		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		

Standard errors in paranthesis
Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001
(1)- (4) estimated using Stata xtpcse procedure, with two-way fixed effects and hetonly options
(5)-(6) estimated using stata xtabond2 procedure with decade fixed effects and noleveleq, orthogonal, robust options

Another concern with the estimation results is endogeneity due to reverse causation or omitted variable bias. With respect to representation, for example, if a tax hike by an authoritarian regime creates dissent, leads to revolution and switch to a representative regime, this would lead to positive bias. Alternatively, if windfall revenues from sources external to the domestic bargaining, such as revenues from silver shipments from colonies to Spanish Monarchs, induced the ruler to suppress the activities of representative assemblies, this would introduce a negative bias. Urbanization is also susceptible to endogeneity concerns. For example, a higher centralized fiscal capacity, if it induces gains in public security, would encourage

IV estimation for the lagged dependent variable and other regressors employing their lagged values as instruments. As the number of periods increases, however, the proliferation of the number of instruments undermines the statistical power of Sargan test for their validity. To limit the extent of this problem, unless otherwise stated, we restrict the choice of instruments to a single lag. See Beck and Katz (2009), Roodman (2009), and Wawro (2002).

market activity and urbanization. [30] To alleviate these concerns and as a general robustness check, we try two empirical strategies. In specifications 1-4 in table 3, we report the results for 2- Stage Least Squares estimation where the proxies for urbanization and representation are instrumented by their lagged values.[31] In specifications 5 and 6, we adopt the less formal strategy of including the lagged values of representation and urbanization as regressors. The results for five of the six specifications are consistent with the baseline findings in identifying positive and significant impacts for urbanization and war pressure and insignificant impact for representation.[32]

TABLE 3: Controlling for Endogeneity

DETERMINANTS OF LOG PER CAPITA TAX REVENUE (IN DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat.					
	Two-Stage IV Estimation				OLS with PCSE with Lagged Regressors	
	(1)	(2)	(3)	(4)	(5)	(6)
	War:Dwpwar	War:Dwpwar	War:Pwar	War:Pwar	Urb.: L5.Urbdec War:Dwpwar Repr.: L10.Parl	Urb.: L5.Urbdec War:Dwpwar Repr.: L5.Ctax
Urbanization	6.345***	3.988*	4.237***	3.393	4.127****	3.682***
	(2.097)	(2.360)	(1.615)	(3.315)	(1.233)	(1.149)
War Pressure	0.842****	0.885***	0.778****	0.839****	0.521****	0.509****
	(0.206)	(0.312)	(0.173)	(0.212)	(0.142)	(0.142)
Representation	-0.502	-0.003	0.149	0.573***	-0.289	0.031
	(0.589)	(1.168)	(0.162)	(0.206)	(0.426)	(0.121)
Observations	163	162	163	162	163	163
R2	0.765	0.788	0.783	0.801	0.800	0.799
Endog. Variables	Urbdec and Parl	Urbdec and Parl	Urbdec and Ctax	Urbdec and Ctax		
Instruments	L5. Urbdec and L10.Parl	L5. Urbdec and L10.Parl	L5. Urbdec and L5.Ctax	L5. Urbdec and L5.Ctax		
Controls		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		

Standard erros in paranthesis
Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001
(1)- (4) estimated using Stata xtivreg2 procedure with fe first robust bw(1) options
For (1) -(4) Angrist-Pischke first-stage F statistics reject weakly identified instruments at 0.01 leve
(5) - (6) estimated using Stata xtpcse procedure, with two-way fixed effects and c(ar1) and hetonly options

[30] For a number of reasons, the case for endogeneity of war pressure is weaker. Since the regression equation includes two-way fixed effects, the source variation that drives the results is the variation in decennial war pressures after averaging out country means and decade means. Hence, the impacts of omitted variables such as geofigurey and level of military technology are controlled for to the extent that their impacts are time persistent or common to different polities. Furthermore, historical evidence suggests, while these and other omitted factors induced the rivalries and tensions between the polities, the actual onset and end to wars and thus the decade to decade variation was largely driven by a number of random factors such as personality traits or health of monarchs. As for a reverse causation channel from per capita tax revenues to warfare, the argument that wars were driven by perceptions of power balance rather than the power balance itself works against it. See Blainey (1988), Fearon (1995).

[31] Since these variables are not coded for each decade, we use 5 decade lagged values of Urbdec and Ctax and 10 decade lagged value of Parl as instruments.

[32] The exception is specification 4, where urbanization carries the right sign but is insignificant and representation has a positive and significant coefficient, arguably due to the inclusion of three control variables in the regression that tend to move together with urbanization rate.

5. Interaction between Representation and Interstate Warfare

In the previous section, we empirically investigated H3 and H4 that respectively posited representative regimes had a negative and a positive fiscal impact and did not find conclusive evidence for one or the other. Both of these hypotheses posited that representation had unconditional and direct fiscal impact. In this section, we turn to hypotheses that argue representation did matter, but its effect was contingent on warfare. Specifically, we review the arguments that respectively posit representative regime mattered by decreasing (H5) and increasing (H6) the effect of warfare on build-up of fiscal capacity and put these hypotheses to test.

The hypotheses discussed in this section for the fiscal impact of political regime are contingent versions of those discussed in the previous section. The essence of representative assemblies is again identified as their role in solving collective action problems among the elites. The contingency here is that, since spending on warfare was by far the largest expenditure item for all European polities, and the domestic negotiation over taxation took place and the reorganization of fiscal military apparatus occurred during and for interstate warfare[33], the differences between the fiscal impacts of representative and authoritarian regimes should have manifested themselves during episodes of war. Put differently, regime type mattered by mediating the impact of warfare on state building.

Beyond this common premise, two different characterizations of the relationships between rulers and elites lead to two contrasting hypotheses regarding the representation-warfare interaction. The characterization that emphasizes the conflict between ruler and elites and the role of coercion in domestic politics argues that representative regimes performed worse under war pressure and undermined the impact of warfare on centralized state-building. An example to this line of reasoning is Downing's discussion of Europe. In his treatment, in parts of Europe where war was protracted and war pressure was heavy, representative regimes did not fare well

[33]Bonney (1999), Bosker et al. (2011), Körner (1995).

in mobilizing domestic resources and could not compete with authoritarian regimes, whereas in regions where the pressure was light, this was not necessarily the case and representative regimes survived.[34] Formally:

> **H5**: Centralized fiscal capacity had negative cross elasticity with respect to representation and interstate warfare.

Alternatively, the extension of the characterization that emphasizes the role of consent in taxation argues for a positive interaction between representation and warfare. In this vein, Hoffman and Rosenthal (1997) and Rosenthal (1998) argue that in Western Europe representative regimes corresponded to a deal between ruler and domestic elites that entailed elites' consent to financing warfare in exchange for a greater say in the control of the unified state apparatus.[35] In formal terms:

> **H6**: Centralized fiscal capacity had positive cross elasticity with respect to representation and interstate warfare.

Empirical Analysis

To investigate H5 and H6, we add the interaction term between war pressure and representation as a regressor to different econometric specifications discussed previously and investigate its sign. We first do so for OLS with PCSE with two-way fixed effects specification. The regression equation is:

$$r_{it} = \alpha_i + \beta_t + X_{it}'\gamma + \theta_1 Urb_{it} + \theta_2 War_{it} + \theta_3 Repr_{it} + \theta_4 (War_{it} * Repr_{it}) + \varepsilon_{it}$$

where ε_{it} exhibits heteroskedasticity and autocorrelation. Since both H5 and H6 concern the cross derivative of log per capita tax over wage ratio with respect to war pressure and representation, the coefficient of interest is the coefficient of the interaction term:

[34] Downing (1992).
[35] In the literature it is difficult to draw a clear cut line between works that posit representation had an unconditional positive fiscal impact (H4) and those that posit a positive interaction with warfare (H6), since the arguments are often multilayered.

$$\frac{\partial \mathrm{r}}{\partial \mathrm{War}\,\partial \mathrm{Repr}} = \theta_4$$

For the empirical evidence to lend support to H5, θ_4 should be negative and significant, and for H6, positive and significant.

Table 4 reports the regression results. As in table 1, in addition to the baseline specification 1, we report the estimates after controlling for nominal wage, population density and book production (2), employing a whole different set of proxies for urbanization, war pressure and representation without (3) and with the control variables (4), dropping England (5) and Sweden, Prussia and Russia (6) from the sample. In none of the specifications the interaction term is significant at 10 per cent level.

TABLE 4: Baseline Regressions with Representation-War Pressure Interaction

DETERMINANTS OF LOG PER CAPITA TAX REVENUE (IN DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat. OLS with PCSE					
	Full Sample				Excl. England	Excl.Sweden Russia Prussia
	(1) Urb.: Urbdec War:Dwpwar Repr.: Parl	(2) Urb.: Urbdec War:Dwpwar Repr.: Parl	(3) Urb.: Urbhc War:Pwar Repr.: Ctax	(4) Urb.: Urbhc War:Pwar Repr.:Ctax	(5) Urb.: Urbdec War:Dwpwar Repr.: Parl	(6) Urb.: Urbdec War:Dwpwar Repr.: Parl
Urbanization	8.242****	7.954****	7.991****	7.929****	8.350****	8.174****
	(1.265)	(1.404)	(1.225)	(1.379)	(1.607)	(1.266)
War Pressure	0.699***	0.615***	0.149	0.121	0.692***	0.419
	(0.225)	(0.230)	(0.162)	(0.165)	(0.240)	(0.347)
Representation	-0.135	-0.042	0.021	0.163	-0.135	-0.166
	(0.223)	(0.234)	(0.151)	(0.148)	(0.243)	(0.224)
War Press.* Repr.	-0.318	-0.240	0.048	0.092	-0.386	-0.044
	(0.265)	(0.266)	(0.179)	(0.180)	(0.327)	(0.383)
Lag. Log Nom. Wage		-0.140		-0.225*		
		(0.124)		(0.123)		
Lag. Log Pop. Density		0.063		0.072		
		(0.048)		(0.053)		
Log Book Prod.		0.003		0.030		
		(0.063)		(0.066)		
Observations	179	173	179	173	149	150
R2	0.848	0.859	0.831	0.855	0.852	0.862

Standard errors in paranthesis
Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001
Estimated using Stata xtpcse procedure, with two-way fixed effects and c(ar1) and hetonly options

In Table 5, we model the dynamic nature of state capacity by including the lagged dependent variable as a regressor. Specifications 1-4 are OLS with PCSE, 5-6 by Arellano Bond dynamic estimation. The results are consistent across the specifications in that the interaction term is insignificant.

TABLE 5: Dynamic Regressions with LDV and Representation-War Pressure Interaction

DETERMINANTS OF PER CAPITA TAX REVENUE (IN LOG DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat.					
	OLS with PCSE				Arellano Bond Dynamic Estimator	
	(1) Urb.: Urbdec War:Dwpwar Repr.: Parl	(2) Urb.: Urbdec War:Pwar Repr.: Parl	(3) Urb.: Urbhc War:Pwar Repr.: Ctax	(4) Urb.: Urbhc War:Pwar Repr.: Ctax	(5) Urb.: Urbdec War:Pwar Repr.: Parl	(6) Urb.: Urbhc War:Pwar Repr.: Ctax
Lag. Log Per Cap. Tax Wage Rat.	0.492****	0.482****	0.531****	0.507****	0.612****	0.660****
	(0.067)	(0.071)	(0.065)	(0.070)	(0.076)	(0.054)
Urbanization	3.586***	3.220**	3.153****	3.054**	1.771**	1.850****
	(1.096)	(1.293)	(0.915)	(1.229)	(0.748)	(0.511)
War Pressure	0.615***	0.598***	0.307*	0.290*	0.597*	0.062
	(0.219)	(0.222)	(0.162)	(0.167)	(0.340)	(0.397)
Representation	0.004	0.007	0.101	0.110	0.143*	0.005
	(0.162)	(0.178)	(0.104)	(0.113)	(0.080)	(0.081)
War Press.*Repr.	-0.321	-0.306	-0.127	-0.109	-0.226	0.268
	(0.250)	(0.253)	(0.189)	(0.193)	(0.359)	(0.478)
Observations	143	143	143	143	120	120
R2	0.954	0.955	0.953	0.953		
ar1					-1.627	-1.628
ar1p					0.104	0.103
ar2					0.628	0.597
ar2p					0.530	0.551
Controls		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		

Standard erros in paranthesis
Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001
(1)- (4) estimated using Stata xtpcse procedure, with two-way fixed effects and hetonly options
(5)-(6) estimated using stata xtabond2 procedure with decade fixed effects and noleveleq, orthogonal, robust options

Lastly, in table 6, we employ two strategies to address endogeneity concerns. Specifications 1-4 are estimated using 2-Stage Least Squares estimation, where urbanization, representation and representation-war pressure interaction are instrumented by lagged values of urbanization and representation and the interaction of lagged value of representation with war pressure. In specifications 5 and 6, we estimate OLS with PCSE by including lagged values of urbanization and representation. The interaction terms are again insignificant at 10 per cent and hence do not lend support to either H5 or H6.

TABLE 6: Controlling for Endogeneity with Representation-War Pressure Interaction
DETERMINANTS OF LOG PER CAPITA TAX REVENUE (IN DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat.					
	Two-Stage IV Estimation				OLS with PCSE with Lagged Regressors	
	(1) War:Dwpwar	(2) War:Dwpwar	(3) War:Dwpwar	(4) War:Dwpwar	(5) Urb.: L5. Urbdec War:Dwpwar Repr.: L10.Parl	(6) Urb.: L5. Urbdec War:Dwpwar Repr.: L5.Ctax
Urbanization	6.333***	4.041*	5.551****	5.757*	4.164****	3.698***
	(2.055)	(2.348)	(1.550)	(2.958)	(1.232)	(1.152)
War Pressure	1.010****	1.101***	0.382***	0.378**	0.595**	0.479**
	(0.214)	(0.346)	(0.147)	(0.163)	(0.253)	(0.203)
Representation	-0.356	0.163	0.105	0.479**	-0.266	0.024
	(0.592)	(1.130)	(0.169)	(0.208)	(0.432)	(0.125)
War Press.*Repr.	-0.301	-0.370	0.090	0.084	-0.126	0.033
	(0.262)	(0.242)	(0.171)	(0.170)	(0.341)	(0.152)
Observations	163	162	163	162	163	163
R2	0.775	0.795	0.783	0.806	0.801	0.799
Endog. Variables	Urbdec, Parl and its interactions	Urbdec, Parl and its interactions	Urbdec, Ctax and its interactions	Urbdec, Ctax and its interactions		
Instruments	L5.Urbdec, L10.Parl and its interactions	L5.Urbdec, L10.Parl and its interactions	L5.Urbdec, L5.Ctax and its interactions	L5.Urbdec, L5.Ctax and its interactions		
Controls		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		

Standard erros in paranthesis
Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001
(1) - (4) estimated using Stata xtivreg2 procedure with fe first robust bw(1) options
For (1) -(4) Angrist-Pischke first-stage F statistics reject weakly identified instruments at 0.01 level
(5)- (6) estimated using Stata xtpcse procedure, with two-way fixed effects and c(ar1) and hetonly options

6. Interaction between Urbanisation, Representation and Interstate Warfare

In the previous section, H5 and H6 were presented as alternative hypotheses arguing respectively that representation diminished and facilitated the impact of warfare on state-building, and the empirical evidence did not lend conclusive support for one or the other. In this section, we investigate yet a finer argument for the fiscal impact of regime types that does not characterize H5 and H6 as contradicting each other, but rather, as mechanisms that were respectively more relevant for rural and urban economies. This characterization builds on the insight that whether representative assemblies worked towards or against expansion of a centralized fiscal-military apparatus in early modern Europe was contingent on the socio-economic structure of the polity, because economy determined the leverages and the incentives of the sides to the domestic bargain. In what follows, we first review the basis for this argument

and then put to test the conjectured three-way relationship between urbanization, representation and warfare.

The argument we investigate in this section is consistent with the theoretical framework of the preceding sections, in that the impact of a representative regime is again reduced to its positive effect on the collective action and organizational capacity of the elites, and that regime's fiscal effect manifests itself mainly under pressure of war. The contingency introduced to the argument is that depending on elite incentives and leverage in the bargain, the gain in collective action capacity due to representation could work both ways. In particular, if the incentives of domestic elites were to restrict the fiscal and coercive capacity of the central state and retain prerogatives at the local level, then, as conjectured in H5, representative assemblies acted as nodes of resistance and precluded or slowed down fiscal centralization. Conversely, to the extent domestic elites had the incentive to fund the central treasury for the war effort and their consent mattered, then, as conjectured in H6, representative institutions reduced the transaction costs of bargaining and solved commitment issues.

For the determinants of the position of the elites in the bargain, the literature conjectures a number of ways through which the distinction between rural-agrarian and urbanized-commercial economies altered the make-up, the leverage and motivations of domestic elites. For rural landowning elites, control over coercion was crucial both for surplus extraction from the agrarian sector and in defending their interests in domestic politics.[36] However, urbanization, commercialization and commodification of labour severed the link between coercion and control over economic resources. Hence, if the need arose for building a centralized army, urbanized elites were less averse to ceding the domestic coercive control. Working towards the same effect, with commercialization, and in particular, the rise of international trade, urban interests increasingly stood to gain from interstate war-making over commerce and colonies. These potential gains made increasing taxation and expansion of the centralized fiscal-military apparatus tolerable for the urban

[36] Ardant (1975).

interests.[37] It is also argued that urbanization and capital accumulation undermined the effectiveness of coercion for taxation. This was because relative to land and labor that were the main taxable resources in rural and agrarian economies, capital was more mobile, harder to monitor and seize solely by force.[38] Consequently, with urbanization, representative regimes performed better in responding to the intense warfare of the period. Formally:

> **H7**: The cross elasticity of centralized fiscal capacity with respect to urbanization, representation, and warfare is positive.

Empirical Analysis

In this section we extend the empirical models to investigate H7. To do so, we include the three-way interaction term between the proxies for representation, war pressure and urbanization as a regressor. For unbiased estimation, it is also necessary to include the three two-way interaction terms. Hence, the baseline regression equation for OLS with PCSE estimation is:

$$r_{it} = \alpha_i + \beta_t + X_{it}'\gamma + \theta_1 Urb_{it} + \theta_2 War_{it} + \theta_3 Repr_{it} + \theta_4(War_{it} * Repr_{it}) + \theta_5(War_{it} * Urb_{it}) + \theta_6(Repr_{it} * Urb_{it}) + \theta_7(War_{it} * Repr_{it} * Urb_{it}) + \varepsilon_{it}$$

H7 states that the cross derivative of log per capita tax wage over ratio with respect to pressure of war, representation and urbanization, θ_7, is positive and significant:

$$\frac{\partial r}{\partial War\, \partial Repr\, \partial Urb} = \theta_7$$

Table 7 reports the estimation results. In five of the six specifications, $\theta_7$is positive and significant at 10 per cent level. Only in specification 7, where Sweden, Russia and Prussia are dropped from the sample, it carries the right sign but is marginally insignificant at 10 per cent. The series for these polities reflect the experiences of the

[37] For example, see O'Brien (1988).
[38] For a theoretical model, see Bates and Lien (1985). Also see Moore (2008) and the discussion in Hoffman and Norberg (1994) p. 312.

latecomers and their exclusion might have resulted in loss of a critical source of variation.

TABLE 7: Baseline Regressions with 2 and 3-way Interactions

DETERMINANTS OF LOG PER CAPITA TAX REVENUE (IN DAYS OF UNSKILLED WORKERS' WAGES)

Dep. Variable:Log Per Cap. Tax Wage Rat.

OLS with PCSE

	Full Sample				Excl. England	Excl.Sweden Russia Prussia
	(1) Urb.: Urbdec War:Dwpwar Repr.: Parl	(2) Urb.: Urbdec War:Dwpwar Repr.: Parl	(3) Urb.: Urbhc War:Pwar Repr.: Ctax	(4) Urb.: Urbhc War:Pwar Repr.:Ctax	(5) Urb.: Urbdec War:Dwpwar Repr.: Parl	(6) Urb.: Urbdec War:Dwpwar Repr.: Parl
Urbanization	22.703****	20.884****	16.559****	15.776****	25.077****	23.763****
	(3.364)	(3.532)	(3.617)	(3.527)	(3.183)	(3.369)
War Pressure	1.617***	1.620***	0.908***	0.995***	1.899****	1.340*
	(0.497)	(0.496)	(0.345)	(0.335)	(0.529)	(0.710)
Representation	1.146***	1.124***	0.620**	0.779***	1.477****	1.253****
	(0.366)	(0.385)	(0.297)	(0.293)	(0.355)	(0.375)
War Press.*Repr.	-0.723	-0.782	-0.386	-0.499	-1.461	-0.284
	(0.670)	(0.668)	(0.399)	(0.392)	(1.152)	(0.917)
War Press.*Urb.	-16.410**	-17.190**	-10.040**	-11.459***	-19.723**	-16.376*
	(7.902)	(7.694)	(4.631)	(4.425)	(8.143)	(9.056)
Repr.*Urb.	-15.850****	-14.258****	-8.060**	-7.985**	-22.026****	-17.154****
	(3.520)	(3.638)	(3.306)	(3.198)	(3.636)	(3.569)
War Press.*Repr.* Urb.	14.394*	15.414*	8.232*	9.991**	19.713**	13.535
	(8.264)	(8.050)	(4.809)	(4.615)	(8.836)	(9.565)
Lag. Log Nom. Wage		0.041		0.116**		
		(0.052)		(0.056)		
Lag. Log Pop. Density		-0.116		-0.188		
		(0.121)		(0.122)		
Log Book Prod.		0.020		0.066		
		(0.062)		(0.066)		
Observations	179	173	179	173	149	150
R2	0.874	0.878	0.847	0.866	0.889	0.892

Standard errors in paranthesis
Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001
Estimated using Stata xtpcse procedure, with two-way fixed effects and c(ar1) and hetonly options

Table 8 reruns the dynamic OLS with lagged dependent variable and Arellano Bond estimation for the full set of two-way and three-way interactions. The coefficient of the three-way interaction term is positive and statistical significance levels are higher compared to baseline results.

TABLE 8:Dynamic Regressions with LDV and 2 and 3-way Interactions

DETERMINANTS OF PER CAPITA TAX REVENUE (IN LOG DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat.					
	OLS with PCSE				Arellano Bond Dynamic Estimator	
	(1) Urb.: Urbdec War:Dwpwar Repr.: Parl	(2) Urb.: Urbdec War:Pwar Repr.: Parl	(3) Urb.: Urbhc War:Pwar Repr.: Ctax	(4) Urb.: Urbhc War:Pwar Repr.: Ctax	(5) Urb.: Urbdec War:Pwar Repr.: Parl	(6) Urb.: Urbhc War:Pwar Repr.: Ctax
Lag Log Per Cap. Tax Wage Rat.	0.425****	0.418****	0.508****	0.488****	0.519****	0.658****
	(0.068)	(0.072)	(0.065)	(0.068)	(0.083)	(0.074)
Urbanization	10.975****	10.427****	6.462**	6.015**	8.397****	5.114**
	(2.773)	(2.878)	(2.690)	(2.741)	(1.360)	(2.428)
War Pressure	2.050****	1.999****	1.666****	1.627****	2.748****	2.205****
	(0.536)	(0.544)	(0.414)	(0.433)	(0.623)	(0.329)
Representation	0.655**	0.660**	0.314	0.302	0.658****	0.144
	(0.299)	(0.311)	(0.214)	(0.234)	(0.103)	(0.115)
War Press.*Repr.	-1.408**	-1.372**	-1.285***	-1.256***	-2.210***	-1.561****
	(0.662)	(0.664)	(0.471)	(0.485)	(0.712)	(0.404)
War Press.*Urb.	-22.772***	-22.059***	-18.045****	-17.689****	-33.698***	-28.419****
	(7.475)	(7.515)	(4.905)	(5.031)	(10.473)	(5.135)
Repr.*Urb.	-7.525***	-7.297***	-3.029	-2.627	-5.978****	-2.630*
	(2.792)	(2.803)	(2.304)	(2.467)	(1.366)	(1.558)
War Press.*Repr.* Urb.	21.201***	20.611***	16.871****	16.608***	32.552***	26.020****
	(7.756)	(7.765)	(5.104)	(5.215)	(11.076)	(5.210)
Observations	143	143	143	143	120	120
R2	0.958	0.958	0.956	0.957		
ar1					-1.680	-1.641
ar1p					0.093	0.101
ar2					0.923	0.760
ar2p					0.356	0.447
Controls		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		

Standard erros in paranthesis

Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001

(1)- (4) estimated using Stata xtpcse procedure, with two-way fixed effects and hetonly options

(5)-(6) estimated using stata xtabond2 procedure with decade fixed effects and noleveleq, orthogonal, robust options

Lastly, in Table 9, we report the results for two strategies we employ against endogeneity. In specifications 1 and 2, urbanization proxy Urbdec and its two and three way interactions are proxied by 5 decades lagged value of Urbdec and its two and three-way interactions. In specifications 3 and 4, representation proxy Parl and its two and three way interactions are proxied by its 10 decades lagged value of Parl and its two and three-way interactions. Specifications 5 and 6 do the same, this time with representation proxy Ctax. Lastly, specifications 7 and 8 are estimated by OLS with PCSE using lagged values of urbanization and representation proxies. Except for specification 5, the coefficient of the three-way interaction term is positive and significant at 10 per cent or higher.[39]

[39] It is worth highlighting how these findings qualify the econometric analysis in sections 4 and 5 that did not allow for higher order interactions. In a regression that omits interaction terms, the estimated effect of representation is the weighted average of the effect of representation contingent on urbanization and warfare levels. The weights used in the averaging are determined by the distribution of urbanization and warfare levels in the sample. Hence, the result that representation improved central fiscal performance for certain urbanization-warfare combinations and undermined it at others is not inconsistent with the results in the previous section where representation did not have an overall positive effect and its fiscal impact did not vary with urbanization.

TABLE 9: Controlling for Endogeneity with 2 and 3-way Interactions

DETERMINANTS OF LOG PER CAPITA TAX REVENUE (IN DAYS OF UNSKILLED WORKERS' WAGES)

	Dep. Variable:Log Per Cap. Tax Wage Rat.							
	Two-Stage IV Estimation						OLS with PCSE with Lagged Regressors	
	(1) War:Dwpwar Repr.: Parl	(2) War:Dwpwar Repr.: Parl	(3) Urb.: Urbdec War:Dwpwar	(4) Urb.: Urbdec War:Dwpwar	(5) Urb.: Urbdec War:Dwpwar	(6) Urb.: Urbdec War:Dwpwar	(7) Urb.: L5.Urbdec War:Dwpwar Repr.: L10.Parl	(8) Urb.: L5.Urbdec War:Dwpwar Repr.: L5.Ctax
Urbanization	23.224****	20.646****	26.682****	22.699****	8.924	13.511***	18.024****	2.493
	(3.429)	(3.504)	(6.555)	(6.160)	(5.767)	(4.565)	(2.983)	(4.033)
War Pressure	1.919****	2.010****	3.200**	2.703***	1.921***	2.154****	1.492****	1.856***
	(0.419)	(0.445)	(1.281)	(0.973)	(0.660)	(0.653)	(0.422)	(0.582)
Representation	1.817****	1.826****	5.423	6.045***	-0.252	0.586	1.221**	-0.037
	(0.362)	(0.438)	(3.498)	(2.014)	(0.738)	(0.626)	(0.564)	(0.245)
War Press.*Repr.	-1.063	-1.126*	-2.812	-1.830	-0.672	-1.033	-0.855	-1.103*
	(0.661)	(0.620)	(1.918)	(1.230)	(0.740)	(0.730)	(0.563)	(0.610)
War Press.*Urb.	-20.564***	-21.077****	-42.055**	-34.877**	-12.957	-21.021**	-16.659**	-20.613**
	(6.711)	(6.304)	(21.448)	(14.018)	(10.063)	(9.342)	(6.601)	(9.086)
Repr.*Urb.	-19.074****	-16.124****	-33.075**	-30.906****	-0.450	-6.120	-13.960****	1.172
	(3.690)	(4.417)	(14.395)	(8.569)	(6.259)	(5.253)	(2.810)	(3.667)
War Press.* Repr.*Urb.	19.696***	20.167***	43.085*	34.781**	8.549	17.831*	16.499**	19.172**
	(7.202)	(6.734)	(23.773)	(13.950)	(10.421)	(9.658)	(6.803)	(9.162)
Observations	163	162	179	173	179	173	163	163
R2	0.824	0.838	0.522	0.433	0.799	0.831	0.832	0.810
Endog. Variables	Urbdec and its interactions	Urbdec and its interactions	Parl and its interactions	Parl and its interactions	Ctax and its interactions	Ctax and its interactions		
Instruments	L5.Urbdec and its interactions	L5.Urbdec and its interactions	L10.Parl and its interactions	L10.Parl and its interactions	L5.Ctax and its interactions	L5.Ctax and its interactions		
Controls		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		L. Log Nom. Wage L. Log Pop. Dens. Log Book Prod.		

Standard errors in paranthesis

Levels of statistical significance:* 0.1 ** 0.05 *** 0.01 **** 0.001

(1) - (6) estimated using Stata xtivreg2 procedure with fe first robust bw(1) options

For (1) -(6) Angrist-Pischke first-stage F statistics reject weakly identified instruments at 0.01 level

(7)- (8) estimated using Stata xtpcse procedure, with two-way fixed effects and c(ar1) and hetonly options

7. Discussion and Implications

The empirical results lend support to the conjectured impact of the rate of urbanization on the relative effectiveness of coercive and consensual taxation and in turn on the relative fiscal performances of authoritarian and representative regimes. In particular, for rural-agrarian economies, they suggest that authoritarian regimes tended to perform better in building centralized state apparatus in response to the stimuli of warfare. It is instructive to interpret this finding based on the evidence on Eastern Europe, where development of markets for labour and land lagged, serfdom persisted into the 19th century, and rulers and elites remained landlords.[40] Consistent with the empirical results, while the authoritarian regimes in Prussia and Russia achieved gains, Poland-Lithuania experienced the breakdown of centralized authority and eventual political demise.

In contrast, at higher urbanization rates, representative regimes tended to perform better in financing interstate warfare. Fiscal performance of England during the 17th century, which experienced more than three-fold increase in per capita tax revenues, provides a case in point. As measured by our proxies, 17th century England ranked high in terms of representativeness of political regime, but in this respect there was little change from the 16th century.[41] What did change in the 17th century was an increase in urbanization rate from less than 6 per cent to more than 13 per cent. Our results suggest that, in addition to any direct positive it effect might have had on tax revenues, urbanization also drove the gains indirectly by improving the representative regime's effectiveness in raising revenue for the wars England engaged in each decade of the century.

The discussion of 17th century England also closely relates to the debate over the political regime for this period between the views that argue respectively for its continuity and a structural break.[42] We identify continuity in regime type, but a break in its performance. This finding is worth discussing, because it helps clarify a

[40] Bonney (1995).
[41] Parl increased from 0.59 to 0.73, whereas Ctax stayed constant at 1.
[42] Compare, for example, North and Weingast (1989) with Murrell (2009).

methodological choice implicit in our analysis and its relevance for the results. We identify continuity in regime type, because the empirical model employs two minimal, objectively quantifiable and input based proxies, namely the existence of an assembly with prerogatives over taxation (Ctax) and its meeting frequency (Parl). These proxies do not measure changes in the finer attributes of the regimes. Rather, the empirical framework treats the finer attributes as an intervening variable between the interaction of a regime type with its environment and the performance of the regime type. This choice serves to avoid the pitfalls of subjective evaluation and coding of regime types, an issue particularly relevant for a long term cross country study like this one. More importantly, it allows us to investigate the deeper determinants of the functioning of regime types, at the cost abstracting away from specific attributes and institutional innovations.[43]

An immediate implication of the contrasting performance of regime types across different environments is that a strong state in a rural economy might be driven by a different regime type and thus has a different underlying political logic than a strong state in an urban economy. For example, by the second half of the 18th century, Prussia and England both had similar and high state capacities, collecting respectively, 13.8 and 13.7 days of unskilled wages per capita as central government revenues. Yet Prussia did so with an authoritarian regime and England with a representative regime, and in this, our findings suggest, the respective urbanization rates of 5.6 and 18.5 per cent played a role. Consequently, despite mobilizing similar shares of their polity's resources, since different sets of political rules governed decision making over taxation and spending, these were essentially different kinds of states.

Taking this line of argument further, our framework suggests that in different economic environments states faced different trade-offs between state capacity and

[43] When in the third stage regressions we employ Acemoglu et.al.'s (2004) measure of constraints on the exercise of arbitrary power by the executive as the proxy for representation, the coefficient of the three-way interaction term carries the predicted positive sign but tends to be statistically weaker and is significant only in some of the specifications. This is consistent with the discussion above, since this proxy codes by itself the changes in the functioning of the regime that in other specifications is captured by the interaction term.

state autonomy over spending decisions. In the rural-agrarian setting, higher state capacity was associated with the repression of rival elites through authoritarian governments and consequently with higher state autonomy from elites. In contrast, for urban-commercial economies, increases in state capacity occurred at the cost of state autonomy, because consent-seeking through representative regimes necessitated bargaining not only over revenue but also over spending decisions.[44] In fact, as the English and Dutch experiences corroborate, for a representative regime in a polity beyond a certain level of urbanization it becomes difficult to speak of a ruler and state apparatus as distinct and autonomous from domestic elites.

Our findings are also consistent with the literature emphasizing the greater capacity of representative regimes to issue public debt, and in turn, the role of public debt in the rise of modern states.[45] The polities where public debt was raised mostly had urbanized economies with liquid capital. This is the same set of polities for which we find evidence for greater effectiveness of representative regimes in war financing. In other words, the two mechanisms worked towards the same effect. We also want to argue, however, public debt was ultimately underpinned by the expanding revenues. In other words, the basis for the growth in state capacity in this period was taxation, above all.[46]

Finally, while this study focused on identifying the impacts of societal variables on state capacity and thus modelled it as the dependent variable, state capacity also acted as an independent variable altering the environment and in particular the economy it operated in. Without identifying state's impact on economy, the positive impact this study identifies from economic development to state capacity provides an incomplete specification of the state-building process, because in the long run the former impact might have magnified or undermined the latter. Specifically, if a strong state fostered economic activity, in other words, if there were positive feedbacks in both directions, this would suggest a virtuous cycle of state-building

[44] See Timmons (2005) and Ross (2004) for the two-dimensional bargaining argument based on evidence from modern democracies.

[45] North and Weingast (1989), Dickson (1967).

[46] Brewer (1989), O'Brien (1988).

and economic development was at work. If, on the other hand, an increase in state capacity depressed economic activity, as would be the case if it meant a greater tax burden on taxpayers, this would imply that long term gains in state capacity due to economic development were less than the immediate gains.

While a comprehensive empirical investigation is beyond the scope of this study, our findings offer qualified support for the positive economic impact of state capacity and a virtuous cycle of state-building. This is because our study provides empirical evidence for increases in central treasury revenues, not increases in the tax burden on economic activity. When interpreted together with the historical and theoretical accounts of early modern state-building, these revenue figures lead to a formulation of state-building as a process of restructuring of the intra-elite relations towards monopolization of fiscal and military capacity. This formulation for the economic impact of the state relates most closely to the chain of impact from monopolization of violence to regularization of taxation, gains in public and national security and in turn to economic growth. The qualification, on the other hand, comes from the finding that the same level of state capacity corresponded to different political logics in different economic resource environments. Accordingly, its impact on growth was not necessarily the same.[47]

8. Fiscal Centralisation during the 19th Century

There were several important developments during the 19th century which, in our view, makes it very different than the early modern era in terms of the determinants and dynamics of fiscal capacity. First, with industrialization and advent of mass armies, domestic politics ceased to be an intra-elite game and states came increasingly in contact with ordinary citizens. In particular, dissent by the masses, rather than elites, became the principal political concern.[48] This also began to alter another empirical pattern our analysis builds on, that taxes were spent on warfare.

[47] For a comprehensive review of the role of early modern states in economy, see Vries (2002).
[48] Acemoglu and Robinson (2005).

Instead, frequency of wars dropped sharply, and public services began to consume increasing shares of state budgets. For these reasons, we believe a different model is needed to help explain the changing patterns fiscal centralization during this period. As a result, we have decided to limit ourselves to providing an overview of the nineteenth century trends and not include them in the econometric analysis.

Per capita tax revenues of most European states continued to rise both in grams of silver and in inflation adjusted terms during the nineteenth century. However, in contrast to the early modern period when increases in per capita incomes had been rather limited and gains in revenues were driven primarily by gains in fiscal capacity as measured by tax over income ratios, there were significant, continent-wide gains in per capita incomes while tax revenue over income ratios showed considerable variation. In some countries, including Great Britain, Netherlands and Prussia, per capita tax revenues rose more slowly than per capita incomes. In other words, tax revenue over income ratios declined. In France and Spain, on the other hand, the ratio of per capita tax revenues over either daily wages or per capita GDP continued to advance until World War I. Similarly, in the countries of southern and eastern Europe where fiscal capacity had been more limited before the nineteenth century, per capita revenues of the states rose faster than per capita incomes. Russia and the Ottoman Empire fit this pattern as well. In other words, fiscal capacity defined by the ratio of per capita tax revenues over either daily wages or per capita GDP was stronger in the periphery than in Western Europe during the nineteenth century.[49]

9. Conclusion

The first part of this study discussed the standardized measures of centralized state capacity we have constructed for early modern Europe and the patterns they reveal. Specifically, we brought together the central treasury tax revenue series for major European states adjusting them for differences in monetary units and changes in population, prices and income. In broad terms, our series have identified large

[49] Maddison (2007), Karaman and Pamuk (2010).

increases in the resource mobilization capacity of states across the continent. They have also indicated that earlier revenue increases in the West than in the East and large variations within each. When compared with the fragmentary evidence available for other regions of the world, it is clear these large gains in fiscal capacity were peculiar to Europe.[50] This widening of differences between state capacities both within Europe and between Europe and the rest of the world during the early modern era help explain the shifts in the continental balance of power as well as the growing material superiority and hegemony of the European states around the world. Our findings also relate to the debate regarding the timing and determinants of the onset of modern growth. In particular, they strongly point to an early divergence for Europe in the form of a growing role for centralized states that predated the 19th century industrialization and increase in average incomes.

These patterns we have identified emphasize the role played by the changes in the nature and capacity of states in the long term trajectory of Europe. From an economic perspective, the monopolization of coercion that predated the Industrial Revolution suggests the gains in internal security might have played a major role in the development process. More broadly, these patterns qualify the view of state as a predatory and autonomous actor in domestic politics and a strong state as inherently inimical to growth. They also suggest a more complex relationship where the state itself and its role in society is the outcome of the interaction of different societal forces.

In the second part, we have investigated the factors that drove these gains in state capacity in Europe. In the first stage of the analysis, working under the premise that their impacts worked independently and unconditionally, we found that changes in economic structure and interstate warfare had positive fiscal effects, while there was no empirical support for a positive or negative effect of elite representation. In the second and third stages, we made explicit the interaction of representative regime with warfare and then with economic structure. The argument we found empirical

[50] The most appropriate comparison is with states in Asia. See Ma (2010) for China, Nakabayashi (2008) for Japan, Moosvi (2008) for India, and Arjomand (1989) and Floor (1999) for Iran.

support for was that differences in economic structure induced differences in relative effectiveness of coercion and consent for taxation and consequently altered the relative fiscal performance of the regime types. Specifically, it was authoritarian regimes in rural economies and representative regimes in urban economies that tended to better withstand war pressure and translate it into building of a centralized state apparatus.

Implicit in the mechanisms of state-building we have identified are premises that were peculiar to Europe and in this sense our findings beg the question further. For one, Europe was unique during the early modern era in terms of the intensity and spread of interstate warfare, one of the drivers of state-building. We have also found that representative assemblies, under certain conditions, facilitated state building, and for this period in history they were also specific to Europe. Hence, the evidence suggests it was the juxtapositioning of Europe's geofigurey and historical heritage with period specific factors that set in motion the process of state-building across the continent.

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Appendix: Proxies for War Pressure

Quantifying the pressure of warfare for a polity is complicated by the fact that each year each polity may have engaged in more than one war, the belligerents formed coalitions, the intensity of each war varied, and the pressure on war participants varied depending on their proximity to center of gravity of the conflict. We construct and employ two proxies for per capita war pressure that takes these factors into account.

The notation is as follows. Countries are indexed by $i,j,k \in C$, wars are indexed by $w \in W$, years are indexed by $t \in \{1500,1501..1800\}$. $Pop_{i,t}$ denotes population of polity i at year t, $Caus_{w,t}$ the total causality due to war w at year t, $Dist_{i,j,t}$ the distances between capitals cities of countries i and j at year t. $I_{i,w,t}$ is an indicator that takes value 1 if polity i participates in war w at year t and zero otherwise. For each war w polity i participates at year t, we denote the set of i's allies with $A_{i,w,t} \subset C$ and the set of i's opponents with $B_{i,w,t} \subset C$.[51]

The first index, Pwar, calculates the war pressure for polity k at year t as follows:

$$Pwar_{k,t} = \sum_{w \in W} \frac{\sum_{j \in B_{k,w,t}} Pop_{j,t}}{\sum_{i \in A_{k,w,t} \cup B_{k,w,t}} Pop_{i,t}} \frac{Caus_{w,t}}{\sum_{i \in A_{k,w,t} \cup B_{k,w,t}} Pop_{i,t}} I_{k,w,t}$$

The first term, $\frac{\sum_{j \in B_{k,w,t}} Pop_{j,t}}{\sum_{i \in A_{k,w,t} \cup B_{k,w,t}} Pop_{i,t}}$ is the ratio of the total population of k's adversaries in war w at year t to total population of the war participants. The second term, $\frac{Caus_{w,t}}{\sum_{i \in A_{k,w,t} \cup B_{k,w,t}} Pop_{i,t}}$, calculates the ratio of total causality to total population of war participants. These two terms together determine the pressure on k at year t due to war w. We then add the pressures across different wars k participates at year t.

Our second and main index also takes the distances between polities into account:

[51] The data on duration, participants and causality for wars is based on Clodfelter (2002). We include all interstate wars the countries in the sample took part it in except for colonial wars.

$$\mathrm{Dpwar}_{k,t} = \sum_{w \in W} \frac{\sum_{j \in B_{k,w,t}} \frac{\mathrm{Pop}_{j,t}}{\mathrm{Dist}_{k,j,t}}}{\sum_{i \in A_{k,w,t} \cup B_{k,w,t}} \mathrm{Pop}_{i,t}} \frac{\mathrm{Caus}_{w,t}}{\sum_{i \in A_{k,w,t} \cup B_{k,w,t}} \mathrm{Pop}_{i,t}} \mathrm{I}_{k,w,t}$$

Note, in this index, the populations of the members of opponent coalition are discounted by their distance to k.

As we did for other variables we calculate decade averages of these yearly indexes. We also rescale each index to vary between 0 and 1, 1 corresponding to the highest value of war pressure for a decade any polity in the sample experiences over the three centuries.

These two indexes rest on a number of assumptions on the nature of war pressure. For one, we assume that the war pressure for polity k in war w is proportional to the total population of the coalition it is a part of and inversely proportional to the total population of opponents' coalition. In other words, population is used as a proxy of a polity's resources for warfare.[52] The ratio of causality to total population of war participants is included to capture the differences in intensity across different wars. Lastly, in our second proxy, it is assumed that the farther away a polity is from a particular opponent, the lower the threat and the pressure.

[52] An alternative would be to use the ratio of centralized tax revenues as the proxy for the ratio of military resources. We prefer to use the ratio of populations for two reasons. For one, the states in our sample, particularly in the early part of the period under study and in Eastern Europe, could mobilize manpower for warfare without centralized monetary taxation, making population the better measure of resources. We also prefer ratio of populations since tax revenues would create serious endogeneity issues in estimation.

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