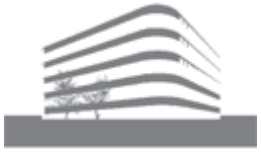

THE ORIGIN OF THE MODERN FISCAL STATE

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Abstract

This paper proposes and tests a new political explanation of the adoption of the income tax in Europe. Existing explanations of fiscal capacity development have stressed the importance of war as the driving factor accounting for the investment in extractive institutions of taxation, but have paid less attention to how domestic economic and political factors shape decisions to invest in fiscal technology. Our empirical examination of the process of income tax adoption by European countries during the 19th century identifies two empirical regularities that challenge predictions coming from existing models of taxation and redistribution. Low levels of electoral enfranchisement and high levels of landholding inequality facilitate the adoption of income taxes. We propose an explanation of the process of income tax adoption that accounts for these empirical regularities. We identify economic and political calculations made by owners of different factors from the adoption of an income tax and how different electoral rules affect these political calculations.[1]

Keywords: Fiscal capacity; Income tax; War; Sectoral redistribution; Restrictive electoral institutions; Land inequality

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INTRODUCTION

The 20th century is the era of the Tax State (Schumpeter, 1918). The size of government expanded at an unprecedented pace (Lindert, 2004). The development of massive spending and investment programs transformed the state from a mere security provider to a central actor in all aspects of economic life. Importantly, this transformation was only possible after the adoption of the income tax and its unprecedented revenue generating capacity. Such extractive capacity makes of the income tax the most advanced fiscal instrument to date (Tilly, 1990). In the words of Johannes Popitz, the income tax is the "queen of taxation" (Popitz, 1926).

The income tax facilitated an increase in the extractive capacity of the state because its adoption went hand in hand with the development of institutions that tapped into and collected previously undetected revenues. In particular, the implementation of an income tax required the creation of a sophisticated tax administration capable of verifying the income of higher earning-individuals in a given economy and ensuring the compliance of the latter with their tax obligations. Thus, to understand this fundamental shift in the extractive capacity of the state that came about through the adoption of an income tax, we need to characterize the political conditions under which elites agreed to subject their income to public scrutiny, the institutions and mechanisms set in place to verify income and the overall progressivity of the tax burden.

Existing explanations of fiscal capacity development share one common overarching theme: war is the driving motor accounting for the expansion of the modern state (Tilly, 1990; Scheve and Stasavage, 2010). By contrast, domestic economic and political variables that account for the decisions of political elites to invest in the development of institutions of fiscal revenue extraction have received less attention. While acknowledging the importance of war, this paper turns to an examination of the latter political factors. While the introduction of income taxes has the potential to generate higher levels of revenue, it also imposes a higher tax burden on individuals with higher levels of earnings. The adoption of this novel form of taxation raised a range of political questions about the allocation of this tax burden across owners that derive their income from different types of assets. Our paper seeks to identify economic and institutional factors that facilitate the resolution of these distributional conflicts and the adoption of income taxes.

In examining the variation in the timing at which various European countries have adopted income taxes, our paper uncovers a number of empirical regularities that contradict predictions coming from standard models of taxation and redistribution. Non-democratic countries with restrictive suffrage rules pioneered the permanent adoption of income taxes. Britain, the pioneer of income tax development adopted this legislation in 1842, at a time when only 13% of its electoral had the right to vote. Austria, Italy and Norway also adopted an income tax under very limited electoral rules. By contrast, France and Switzerland, two countries that extended electoral right relatively early lagged behind in the adoption of income taxes. These findings, already announced by Aidt and Jensen (2009), run counter to the predictions about the temporal sequencing between democratization and fiscal capacity development postulated by the literature on democratization and taxation (Acemoglu and Robinson, 2000; Boix, 2003).

Our paper seeks to address the puzzle rose by the sequence of the income tax adoption in Western Europe. That involves understanding why non-democracies imposed a higher burden on high income earners. To address this question, we focus on the domestic political economies of European countries. We argue that, in addition to their capacity to raise new revenue, income taxes provided additional political and economic benefits to political incumbents in countries with restrictive electoral rules. First, income taxes are an institutional mechanism of inter-sectoral economic

distribution. All non-democratic countries adopted income taxes in a period of massive economic and political change, in which the economic power of incumbent landowning elites was severely threatened by the rise of a new economic elite linked to the emerging manufacturing sector. Anticipating a future decline in economic power, politicians representing the interests of landowning elites regarded the income tax as a tool that could rebalance some of these economic losses by imposing a higher tax burden on the industrial sector. In adopting the new tax, incumbent economic elites placed thus a high political priority on the creation of institutions that monitored less visible income and also on the taxation of more mobile assets. Economic inequality, we hypothesize, increased the capacity of landowning elites to adopt a new income tax that had the capacity to impose a higher burden on owners of mobile assets.

The second set of considerations accounting for these decisions of incumbent elites in non-democratic settings to adopt income taxes were political in nature. Early nineteenth century electoral rules in Western Europe included a variety of provisions that used payment of direct taxes to exclude individuals from political participation. In many early adopters, electoral laws conditioned voting rights on direct tax payments. We claim that incumbent elites saw in these pre-existing electoral provisions an institutional tool to reinforce inequality in political participation. The income tax was, in essence, an additional wedge separating lower income voters from parliamentary representation.

The above discussion provides a number of testable implications about the economic and political factors that enhance the probability of income tax adoption in non-democratic countries. The economic hypothesis suggests that politicians whose interests are tied to owners of fixed assets showed higher willingness to support the adoption of the new income tax than politicians representing the interests of mobile asset holders. We test for this hypothesis by examining the consequences of differences in the bargaining power of landed elite in the national parliaments of 19th century Europe on the probability of adoption of an income tax. Specifically, we use concentration of land ownership as proxy of the bargaining power of landed elites. If landowners considered that the income tax brought about future economic gains, then higher levels of landholding inequality were likely to enhance the probability of adoption of the latter. We also test for the effect of exogenous economic conditions that increase the relative strength of landholding elites such as favorable crop-conditions on the probability of income tax adoption under non-democratic settings.

The calculations of these early political insiders about the desirability of income taxes are also affected by the design of electoral institutions that are in place prior to the expansion of political suffrage. We explore the effects of two types of restrictive electoral institutions that were in place in nineteenth century Europe prior to the adoption of universal suffrage: *tax-based censitary electoral rules* and the *vote-tax link*. These were electoral provisions that used the payment of taxes to exclude low-income individuals from suffrage. We explore how the pre-existence of these electoral rules modified the calculations of political insiders about the desirability of a new income tax. Specifically, we hypothesize that these restrictive electoral provisions create additional political benefits to insiders that can be shared by owners of fixed and mobile assets. These considerations created opportunities for a political alliance in support of an income class among owners of different assets that had different considerations about the adoption of the taxation of income. We examine empirically the effects of vote-tax link and tax-based censitary electoral institutions on the probability of income tax adoption. Consistent with this hypothesis, we find that the vote-tax link increases the probability of income tax adoption under non-democratic settings. By contrast, censitary electoral institutions do not exert any significant effect on the probability of adopting the income tax. We specu-

late about the potential causes accounting for the absence of this relationship at the end of the empirical analysis.

To develop and test these arguments, the remaining part of the paper will be organized as follows. We begin with a descriptive exploration of cross-national patterns in the adoption of income taxes across European countries. We then present a first set of empirical models that examine the importance of war in affecting the timing of income tax adoption across European countries. While these results support the dominant political explanation for the adoption of income taxes, we also find a negative relationship between the scope of suffrage and the adoption of income taxes. In the following section, we formulate a number of arguments that seek to identify economic and political considerations of early political insiders about the desirability of income tax adoption. We first present a number of hypotheses about the economic considerations of the owners of different assets with respect to the advantages of the new income taxes. Next, we explore how different electoral rules modify these economic calculations. Section 4 presents empirical tests of both economic and political explanations. Some final remarks follow.

THE ADOPTION OF THE INCOME TAX

Beginning with the first two decades of the nineteenth century, governments began to take on an increased number of obligations, which included investment in the development of infrastructure, the improvement in the provision of public health and the expansion of the provision for education (Lindert, 2004). To finance these new responsibilities, politicians sought to find ways to diversify the sources of revenue that could be enlisted for tax purposes. The list of possible sources for fiscal revenue considered at the time was, from a contemporary perspective, heterogeneous. Possible taxes that were under consideration at the time included taxes on windows and buildings, taxes on luxuries, taxes on matches, taxes on business and so on. At the time, proposals to impose taxes on income were only one among the many alternatives that was regarded as a source of possible tax revenue.

Recommendations to adopt a tax on income met with strong skepticism and opposition (Daunton, 2001). Opponents of the new tax invoked both political and administrative difficulties associated with its implementation. First, considerable difficulties existed about ways in which "income", the new category that was at the basis of the new tax could be ascertained and what its different components that could be assessed for tax purposes should be. Considerable uncertainty existed as to whether the different sources of income were to be taxed separately, in separate schedules or whether they were to be taxed jointly. Countries that pioneered income tax adoption chose very different solutions to this question, with Prussia and Britain establishing the two possible extremes with respect to the technology of taxation of the new income tax. In Britain, all different components of income in different schedules in order to strengthen monitoring capacity (Musgrave, 1969). Prussia, by contrast adopted what was known as a "synthetic" income tax which required all taxpayers to sum up their disparate sources of revenues for tax purposes (Popitz, 1926). Given the difficulties in defining income, the unit of the new tax, considerable uncertainty existed about the designation of the authority that had the responsibility to verify the tax obligations of different individuals (Daunton, 2001). Finally critics of the new tax objected that the incentives of individuals to comply with the new tax obligations would be very low.

By invoking a combination of these arguments, in some countries opponents of the new tax succeeded in blocking its adoption. In other countries, proponents of the new income tax triumphed against considerable political opposition. Examples of the latter are conservative prime minister Robert Peel who succeeded in forging a political coalition in favor of an income tax or Robert Miquel, the architect of the Prussian income tax who engineered a political coalition in favor of in-

come taxes. Miquel's proposal for an income tax was adopted with a considerable political majority of 322 votes in the Prussian lower house, with only 40 deputies opposing the law. Support for the new tax came from Conservatives, National Liberals and Free Conservatives, three of the largest political parties on the right. Similarly, Peel built an overarching conservative majority to adopt the new income tax in 1842. Appealing to the "superior goal" of fiscal responsibility, Peel reintroduced the income tax in Britain with 97.5 percent favorable conservative vote.

The Prussian and British experiences were not exceptional. Figure 1 presents descriptive information about the timing of the adoption of income taxes across eleven European countries during the period between 1842 - the year when Britain introduced the first permanent income tax- and 1939, the year when Switzerland introduced a permanent income tax at the federal level. The horizontal axis in each graph displays time. The vertical axis represents the scope of suffrage. For each country, the solid line presents year-to-year information on the scope of suffrage. The vertical dashed line indicates the year of the permanent adoption date of the income tax.

The descriptive information presented in Figure 1 reveals a number of surprising patterns concerning the relationship between the adoption of income taxes and democratization. First and surprisingly, we find that a significant number of countries adopted the income tax at a time of very restrictive suffrage. These countries include Britain, which pioneered the modern income tax in 1842, Austria (1849), Italy (1864), Norway (1892), Netherlands (1893) and Sweden (1902). In Britain, the earliest adopter, only 13 percent of the population was eligible to vote in 1842. In Austria-Hungary, the immediate follower, elections were not even regularly held by 1849. In Italy, only 8 percent of adult population was entitled to vote in 1864, the year when income tax was adopted. By contrast, countries that had established extensive suffrage rules early on during the period of democratization delayed the adoption of income taxes by several decades. In France, for instance, proposals to adopt income taxes that were advanced on repeated occasions during the 19th century encountered political opposition and an income tax was adopted only in 1911. These descriptive patterns suggest that early democratizers faced more difficulty in reaching a political consensus about the new tax.

How effective were these early taxes in raising fiscal revenue? Were these early income taxes just scraps of paper adopted for purely ceremonial purposes alone? To examine these questions, we explore the consequences of the adoption of income taxes on direct tax revenue. If income taxes were purely ceremonial, the latter should have no effect on the level of fiscal revenue.

Figure 2 plots the evolution of direct taxation as a share of central government revenue for the early adopters only: the United Kingdom, Austria-Hungary, Italy, Norway, Netherlands and Sweden. All these six countries adopted the income tax under very restrictive conditions of franchise. Certainly, the initial tax rates adopted were low for modern standards. The top rates never exceeded 5% (Kennan, 1910; Popitz, 1926). Yet these taxes were progressive from the very beginning, imposing a higher burden on higher income individuals, who were very remarkably concentrated at the time. To get a better understanding of their fiscal impact, we plot the evolution of direct taxation 15 years before and 15 years after the adoption of the income tax. Year 0 denotes the year in which the income tax was adopted by each country. Figure 2 suggests the existence of a structural break in direct taxation revenue of approximately 7 points precisely at the year of adoption. Certainly, the effect we observe in Figure 2 is not trivial, and poses the question of why this tax was adopted in the first place. To solve this question we need to unravel why a consensus about the adoption in income taxes and investment in the development of fiscal capacity emerged in some countries, but not in other.

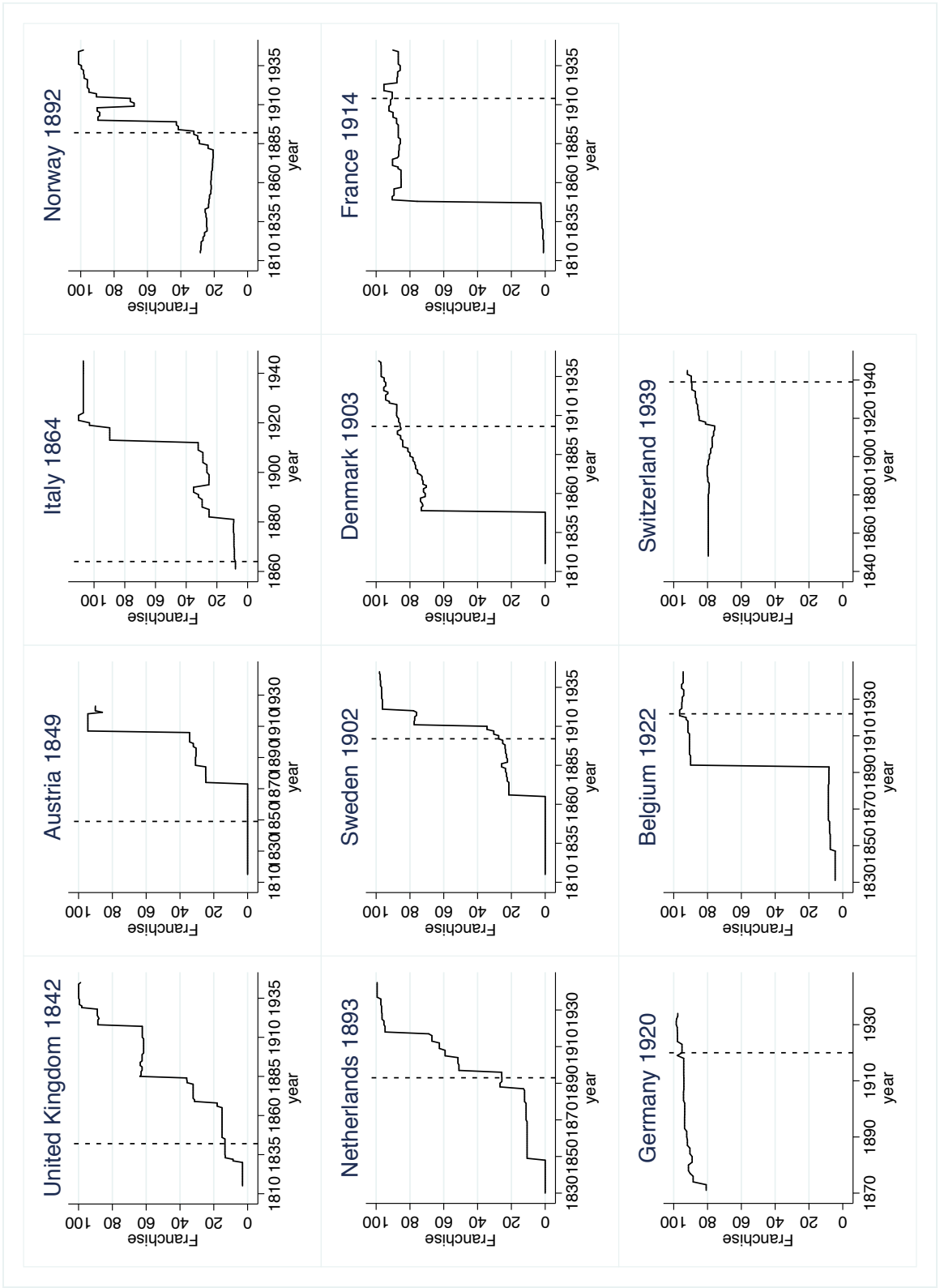

FIGURE 1: Income Tax Adoption and Franchise in Western Europe. The vertical line indicates the year of the permanent adoption of the tax.

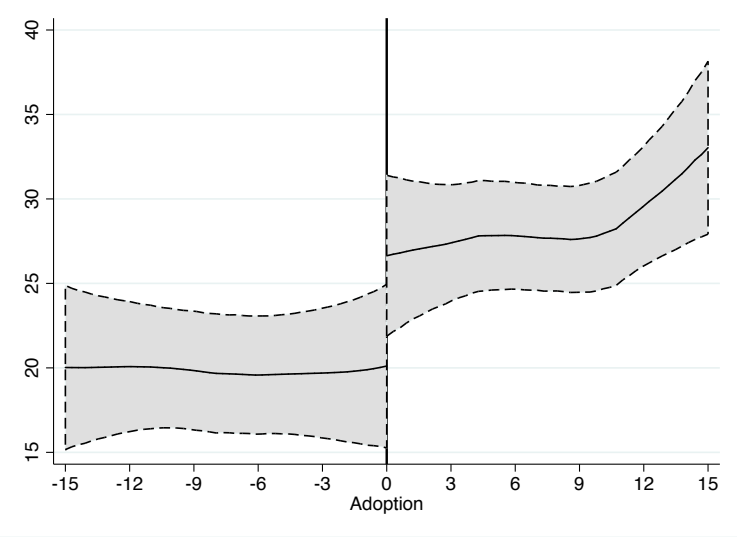

FIGURE 2: Direct Taxation as Share of Central Government Revenue for Early Adopters and a 15-year window frame before and after the permanent adoption of income tax. Local polynomial smoothed line with 90 CI. Source: Flora (1983).

WAR AND INCOME TAX ADOPTION

The proposition that war is a determinant factor of fiscal capacity development dominates comparative research on the origin of the fiscal state (Tilly, 1990; Scheve and Stasavage, 2010). To what extent does war account for the variation in income tax adoption across European countries? To explore this question, we have assembled a dataset set for eleven economies in Western Europe: Austria-Hungary, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Sweden, Switzerland and the United Kingdom. Unfortunately, the absence on economic and political data for this early historical period poses severe constraints on the number of cases that can be included in the analysis. Recent studies examining related questions pertaining to the political economy of taxation in nineteenth century Europe share the same constraint and operate with a similar number of cases (Aidt and Jensen, 2009; Scheve and Stasavage, 2010).

The data in this analysis is necessarily left-censored. It is up to the researcher to decide when a country begins to be at *risk* of adopting the income tax. We follow Aidt and Jensen and consider that the risk arose uniformly across Europe following the defeat of Napoleon in 1815 (Aidt and Jensen, 2009). The Napoleonic Wars propelled the adoption of income taxes all over the continent. After Napoleon's defeat, these taxes were eliminated, but the precedent (and the technology) remained. As such, the risk of permanent tax adoption remained. For those countries that were not independent in 1815, we assume they only become at risk as soon as they gained independence.

The structure of the data is Binary Time Series Cross Sectional (BTSCS). Beck, Katz and Tucker (1998) have proved the virtual equivalence between BTSCS and event history data. As such, the adoption of income tax can be fitted with a standard logistic model. We only need to add a time trend to account for the conditional hazard rate. For that purpose, we follow Carter and Signorino (2010) and fit a cubic polynomial approximation to account for the underlying time trend. The exact model specification is as follows:[2]

$$P(y_{it} = 1|x_{it}, y_{it-1} = 0) = \frac{1}{1 + e^{-(x_{it}\beta + H(t-t_i))}} \quad (1)$$

Expression (1) models the adoption of permanent income tax y by country i at time t (provided it has not been adopted yet) as

[2]We borrow notation from Aidt and Jensen (2009).

a function of time-variant covariates x_{it} and a smooth function of the number of years a country has been at risk of adopting the income tax: $H(t-t_i) = t+t^2+t^3$, where t denotes the time elapsed since the observation enters the sample. By expression (1), once a given unit adopts the income tax, it drops the sample. Altogether, the cross-national sample is made of 641 country-year observations.

We begin by exploring the effect of war on the adoption of income taxes. We use three variables to assess the effects of wars on the probability of income tax adoption. First, we test for the effects of the participation in an interstate war on the probability of income tax adoption. The source of our measure of war participation is the Correlates of War dataset. We allow both for contemporaneous and lagged effects. Secondly, we control for the magnitude of commitments to and preparation for war efforts by including a measure of military mobilization, measured by the share of military personnel to total population. The source of this second variable is Singer, Bremer and Stuckey (1972). Finally, we include a third variable that measures the participation of a country in World War I. The variable takes the value 0 for all countries before 1914, and 1 afterwards only for countries that participated in World War I (Austria, France, Germany, the UK and Italy).

The goal of these models is to assess whether other variables account for the variation in the timing of the adoption of income taxes, once we control for the effect of war. We assess the level of democracy of a country using two controls. The first variable measures the scope of suffrage and was constructed by Aidt and Jensen (2009). We also include for the Polity IV measure of democracy (Marshall and Jaggers, 2000), which captures dimension other than franchise expansion (these being executive recruitment and constraints on the executive). The capacity to adopt permanently the income tax at a given point of time might be driven by previous spells of income taxation, either at the national or local level. To account for this possibility, we add two variables, *local tax* and *temporary tax*, indicating whether a country had had any temporary experience with income taxation at any level of government before its permanent adoption at the national level. These variables were constructed by Aidt and Jensen (2009) and generously shared by these authors. Our models also include a battery of socio-demographic controls, which include (the log of) population and economic development of a country (GDP/capita). These variables are strongly correlated with other proxies of state capacity, such as post mail coverage or educational enrollment, which we have omitted to minimize multicollinearity.[3] To account for the level of monetization of the economy (Tilly, 1990), we also control for the urbanization level. This variable that takes the value 1 if more than 10 percent of inhabitants lived in cities with over 20.000 inhabitants.[4]

The models reported in Table 1 assess the importance of war in explaining the adoption of income taxes. These findings show considerable support for the established theoretical hypothesis that preparations for war affect political investments in institutions of fiscal extraction. Model 1 shows that participation in wars affects the probability of income tax adoption. Model 2 and 3 include lags of war participation to account for war-generated debt requiring additional revenue. The contemporaneous war indictor remains statistically significant in both models, and its lags almost are too. By contrast, mobilization does not seem to increase the probability of income tax adoption despite it holds the expected sign.[5] In model 5, we also find support for the recent finding reported by Scheve and Stasavage (2010): military participation in World War I did significantly increase the probability of adoption of an income tax. However, as Model 6 suggests, this effect seems to be particularly strong the larger the franchise level.

The models presented in Table 1 recon-

[3] Nevertheless, results are virtually identical when we include either of these variables.

[4] See Aidt and Jensen (2009) for the original sources of the socio-economic controls.

[5] We lack complete data for war mobilization. That explains the smaller N for Model 4.

TABLE 1: The Adoption of the Income Tax in Europe. Is War all that matters?

	(1)	(2)	(3)	(4)	(5)	(6)
Franchise	-0.069***	-0.078***	-0.092***	-0.077*	-0.079***	-0.080***
	(0.019)	(0.015)	(0.017)	(0.045)	(0.024)	(0.025)
Polity	-0.259	-0.321	-0.398*	-0.178	-0.189	-0.230
	(0.184)	(0.202)	(0.237)	(0.218)	(0.219)	(0.205)
War	1.802*	1.873*	2.192**	1.736*	1.675*	1.696*
	(0.983)	(1.079)	(1.077)	(0.932)	(1.000)	(0.978)
War_{t-1}		1.600	1.692*			
		(1.185)	(0.901)			
War_{t-2}			1.614			
			(1.054)			
% military/population				0.146		
				(0.132)		
WW1 participant					4.853	-65.097**
					(2.977)	(29.496)
WW1 participant × Franchise						0.737**
						(0.302)
Temporary tax	-2.747	-3.297	-4.103	-3.149*	-3.160*	-3.515**
	(2.060)	(2.205)	(2.646)	(1.650)	(1.766)	(1.687)
Local tax	2.704**	2.936***	3.275***	3.565	2.162	2.167
	(1.248)	(1.082)	(1.166)	(3.568)	(1.409)	(1.440)
ln(Population)	1.179***	1.138***	1.201***	1.047***	0.677	0.800
	(0.419)	(0.421)	(0.441)	(0.382)	(0.753)	(0.681)
ln(GDP/Capita)	4.617*	5.785**	7.375**	2.724	4.353*	4.968**
	(2.651)	(2.805)	(3.373)	(4.522)	(2.614)	(2.367)
Urbanization	-0.527	-0.843	-1.313	0.440	-0.668	-0.685
	(0.971)	(1.016)	(1.116)	(2.077)	(1.010)	(1.020)
Intercept	1.658	3.645	6.343	-2.416	2.687	3.609
	(5.547)	(5.750)	(6.876)	(11.371)	(5.058)	(4.720)
N	640	629	618	575	640	640

All models include a third-order flexible polynomial of the number of years elapsed without the income tax to model duration dependence. Robust, country-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

firm long-standing explanations of fiscal capacity development. War is main predictor of fiscal innovations. Yet, the same models also highlight the importance of domestic political conditions in affecting the probability of income tax adoption. Consistent with Aidt and Jensen (2009), we find a strong, robust negative relationship between the scope of the suffrage and the probability of adoption of income taxes. These results challenge predictions coming from the standard model of taxation and redistribution, the Meltzer and Richard (1981) model. The latter predicts that the extension of suffrage and the enfranchisement of low-income voters should facilitate the adoption of taxes that impose higher burdens of higher income earners. By contrast, countries with narrow levels of suffrage are hypothesized to encounter high difficulties in adopting an income tax. The findings raise thus the puzzle why and under what conditions elites in countries with limited suffrage agree to adopt an income tax? We turn next to a formulation of a set of hypotheses that can account for these findings.

THE NON-DEMOCRATIC ADOPTION OF INCOME TAXES: TWO HYPOTHESES

In this section we formulate two hypotheses that account for the adoption of income taxes under conditions of limited political suffrage. Our first hypothesis assumes that the adoption of the income tax results from a political bargain in which owners of different assets attempt to roll off the burden of taxation onto the other class. This is, in essence, an argument of inter-sectoral redistribution through taxation. Specifically, we argue that at early stages of political development, owners of fixed assets (landed elites or *old elites*) were more successful in imposing the new tax on owners of mobile assets (urban elites or *new elites*). We find that structural economic conditions increasing the bargaining power of landowning elites -such as high levels of landholding inequality and shorter-term changes in the economic environment- facilitated the adoption of income taxes in the conditions of limited political suffrage.

Economic considerations about the distribution of the tax burden among the owners of different factors are not the only factor driving the early adoption of income taxes in non-democracies. Conditional on some pre-existing electoral provisions - censitary rules and the vote-tax link - the income tax, we argue, offered a good opportunity to maintain inequality in political representation. These electoral provision conditioned political participation on income tax payments in ways we develop below. Thus, by adopting the income tax, the incumbent elites (either landed or urban) added a new impediment to political participation of the working class. We explore this second set of hypotheses codifying these very particular electoral provisions for the eleven Western European economies in our sample.

Economic considerations for income tax adoption: sectoral incidence

Prior to the adoption of the income taxes, governments relied on very heterogenous sources of taxes to collect the necessary fiscal revenue. These taxes included poll taxes, property taxes, and a variety of consumption taxes (Popitz, 1926; Seligman, 1911). The income tax promised to bring two changes and innovation to this policy landscape. The first innovation was that of uniformity. The income tax sought to replace a variety of different sources of revenue with one single category: income. The income tax also carried the promise of higher fiscal revenues by enlisting previously unused fiscal resources. These resources that were previously untaxed by governments were distributed unequally across sectors. Precisely, this unevenness in the location of the new income was a source of distributional conflict.

Two questions were at the center of the inter-sectoral conflict. The first was the desirability of the taxation of income, as compared to the taxation of other sources of revenue. The second question concerned

the inter-sectoral allocation of the tax burden (i.e., the incidence of taxation), particularly relevant in a period of major economic change produced by the industrialization of Western economies. We hypothesize that owners of fixed assets considered the income as a much more attractive fiscal instrument as compared to owners of mobile assets. First, owners of fixed assets favored the reliance on income as the category that defined the tax liability of the individuals. That allowed fiscal authorities to draw on and enlist new sources of revenue, such as profits, that had previously escaped taxation and that were more likely to be found in the newly rising industrial sector. Secondly, owners of fixed assets also hoped that the introduction of the new income tax would relief the taxation of other assets, such as land. By contrast, owners of mobile assets were more likely to express worries and concerns about the desirability of the introduction of a new tax on income. The income tax would not only target profits (previously untaxed) but also make manufacturing products more expensive in a context of increasing international competition. Accordingly, owners of mobile capital were likely to oppose the new income tax.

This first hypothesis postulates the existence of sectoral conflict between landed and industrial elites over the adoption of the new income tax. Economic conditions are likely to affect the relative bargaining power of owners of different assets. Specifically, economic factors that increase the relative bargaining power of owners of fixed factors are likely to increase the probability of income tax adoption. One such economic condition is the level of rural inequality. The latter is a fairly constant variable over time. To account for short-term variation in the bargaining power of the landed elite, we utilize a proxy of the yearly productivity of agriculture, one of the two main sources of income of fixed-capital owners (the other being real estate). Specifically, we use the close relationship between rainfall and yield crops to account for short-term fluctuation in agriculture productivity. Altogether, we hypothesize that the likelihood of adoption of the income tax is increasing in the bargaining power of the landed elite, which is a function of its short- and long-term economic predominance. By contrast, in countries where landed elite is weaker, we expect delays in the adoption of income taxes due to the opposition of mobile capital owners.

Our theoretical hypothesis about the effect of rural inequality about the ability of elites to reach compromises about the new income tax is the opposite of the prediction in the existing literature (Sokoloff and Zolt, 2007). In our account, rural inequality affects political expectations about the implementation of the new tax and (conditional on other factors) should have a positive effect on the probability of income tax adoption. This hypothesis is consistent with Hallerberg (1996)'s analysis of tax competition in the Wilhelmine Germany (1871-1914). He documents how Länders with limited suffrage and strong landed elites in Parliament - Prussia being the paradigm - proved successful in passing the incidence of direct taxation onto the mobile capital owners (see also Hallerberg (2002) for a case-specific analysis). By contrast, Länders with more open franchises and weaker landed elites in Parliament (e.g. Baden) increased the tax rate on mobile capital and labor *together with* the land tax.

Political considerations for income tax adoption: the effects of electoral institutions

In many European countries, political negotiations about the adoption of the income tax took place in an environment characterized by restrictive electoral rules. Many of the electoral systems that were in place in nineteenth century Europe used both wealth and the payment of taxes as criteria that allocated electoral rights. An important issue facing politicians that adopted the income tax was whether the new law could modify the existing electoral power of incumbent elites in a given electoral system. In this section, we consider these additional political calculations about the effects of the income tax. Specifically, we assess the consequences of two of these restrictive electoral rules:

tax-based censitary rules and the vote-tax link.

By tax-based censitary rules we refer to those electoral institutions that weigh the vote of each elector to his tax payments.[6] Tax-based censitary rules can take one of two forms. Voters might be assigned to different *estates* or *curias* in Parliament depending on the amount of their tax payments. Estates are assigned a number of seats disproportional to the number of individuals allocated to them. Ultimately, the seat-to-vote ratio is favorable to the higher income voters, that is, those who pay higher taxes and concentrate in the upper estate. France adopted this system temporarily (1820-1831) while Austria-Hungary kept it until the early twentieth-century. The second form of tax-based censitary rule is much simpler: the number of votes an individual casts is made a function of the amount of tax-money he pays. In this system, one individual may cast one, two, or n votes for the national parliament depending on her tax records. This system was adopted in Belgium from 1894 to 1919.

The *vote-tax link* is the other type of electoral provision that used payment of direct taxes to refrain individuals from political participation in nineteenth century Western Europe. Specifically, the vote-tax link is an electoral institution that conditions the right to vote on prompt payment of direct taxes. In other words, the right to vote was *linked* to the payment of direct taxes. The vote-tax link was widely used in Europe. Austria-Hungary (1849-1907), Belgium (1830-1892), France (1815-1852), Italy (1848-1912), the Netherlands (1849-1917), and Norway (1885-1897) adopted this electoral provision. The United Kingdom for most of the nineteenth century adopted it too, but only for local elections.

The pre-existence of tax-based censitary rules and the vote-tax link might establish convenient political tools for incumbent elites. These electoral institutions offered a technology that could be easily reconfigured as a tool of political exclusion and fiscal conservatism once the new tax was in place. Censitary rules could easily reinforce the political advantage of incumbent elites by raising the bar to access the higher, more influential estates in Parliament. The more direct taxes one had to pay to access the top electoral brackets, the more exclusive the latter became. Similarly, the vote-tax link created two distinct opportunities of political exclusion of the poor. On the one hand, by making the cost of political participation visible, the vote-tax link was likely to discourage demands of low-income voters for franchise expansion. On the other hand, the pecuniary cost of political participation was likely to depress the participation rates of the poorer strata among those qualified to vote (i.e., the urban middle classes). With respect to the fiscal outcomes, the vote-tax link was seen as a guarantee of fiscal conservatism -much in vogue in the second half of the nineteenth century in Europe. At the time, it was believed that voters would refrain from demanding high expenditure programs (and thus, high taxes) only if they were to fund these programs out of their own pockets (Daunton, 2001). Under that belief, a linkage between voting rights and income taxation was seen as a natural mechanism to prevent overspending.[7] In the words of William E. Gladstone: "it is desirable in a high degree, when it can be effected, to connect the possession of the franchise with the payment of taxes" (quoted in Matthew (1988, p.127)). For all these reasons, we expect that the pre-existence of tax-based electoral institutions should facilitate the adoption of the income tax in a non-democratic setting.

Table 2 summarizes our hypotheses about the desirability of an income tax of rich voters in countries with restrictive suffrage. These hypotheses formulate a range of plausible micro-logics that may explain the early adoption of income taxes by non-

[6] This tax-based censitary rule is one of the many censitary rules operating in nineteenth century Europe. Others were based on occupation or wealth criteria. However, ours is particularly relevant to understand political benefits derived from the adoption of the income tax.

[7] This same goal still inspired electoral provisions in many democracies in the late twentieth century (Ardanaz and Scartascini, 2013).

TABLE 2: Summary of Hypotheses under the Assumption of Future Changes in Economic Positions.

	Economic gains from income taxes	Political gains from income taxes
Owners of fixed assets (old elites)	Yes	Yes
Owners of mobile assets (new elites)	No	Yes

democracies. We have identified both economic and political considerations of owners of fixed and mobile assets, respectively. With respect to economic gains, we have hypothesized that owners of fixed assets are more likely to gain from the adoption of an income tax than owners of mobile assets. We have also hypothesized that pre-existing electoral rules may offer political advantages to insiders upon the adoption of income taxes. The latter might amplify the inequality in representation and thus reinforce the political advantage of incumbent elites. In this regard, we expect that *both* owners of fixed and mobile assets should benefit from the adoption of income tax in presence of these very particular electoral provisions (censitary rules and the vote-tax link). Precisely, this common gain might bring together elites from different sectors in what, otherwise, would cause strong disagreement.

A test of the economic hypothesis of income tax adoption

Our economic hypotheses suggest that politicians representing fixed factors should be more supportive of the adoption of an income tax as compared to politicians representing mobile assets. As the income tax taxed previously undetected income, it imposed a higher burden on the owners of mobile assets as opposed to the owners of fixed assets. Secondly we have argued that expectations of future changes in the balance of power among owners of fixed and owners of mobile assets are likely to affect their relative preferences about the desirability of the new income tax. Particularly, we claim that in a time of major economic change landed elites in limited democracies favored the adoption of income taxes because the incidence of this tax fell mainly on the new urban elites. The income tax was, in other words, an institutional mechanism of economic balancing.

The observable implication of this economic hypothesis is that economic and political factors that strengthen relative bargaining power of owners of fixed assets are likely to increase the probability of income tax adoption. We follow the empirical strategy of the literature on democratization and proxy the economic power of landowning elites using a measure of land concentration. To test this hypothesis, our estimations include a time-varying measure of land-inequality, as constructed by Vanhanen (2003) from the agricultural census sources of the periods.[8] We expect a positive relationship between this variable and adoption of the income tax.

For each country, land inequality displays fairly high levels of temporal stability. This variable might not capture short-term changes in the bargaining power of landed elites. The latter might be conditioned by a myriad of political and economic conditions. We pick one of them: their actual economic performance. Specifically, we assume that the bargaining capacity of landed elites in parliament vis-à-vis urban elites is conditioned by the economic performance of agriculture. Basically, a wealthy landed elite that is economically concentrated should be

[8] Vanhanen (2003) offers decennial values of land ownership concentration. We run a linear interpolation to complete his series.

able to mobilize more political resources in order to pass (even impose) a new levy in Parliament, the income tax, which imposes higher burdens on the modern sector.[9] On the other extreme, a ruined landed elite would lack the political resources to pass such a law, despite the concentration of landholding.

To capture short-term changes in the landed elite economic status (and thus, bargaining power in parliament) we measure to the productivity of land, which is itself a function of precipitation levels. Crop yields are negatively affected by sustained periods of high or low precipitation records (Olesen and Bindi, 2002). To measure favorable and unfavorable conditions for agriculture, we start by computing yearly average precipitation levels for each European country. For that purpose, we use the historical rainfall dataset assembled by Pauling, Luterbacher, Casty and Wanner (2006). Then, in order to capture precipitation shocks, we have calculated the annual percent change in the level of precipitation and took moving averages of various lengths. Here, we report three of them: four-, five- and ten-year moving averages (including the current year). Extreme sustained rainfall conditions (either too high or too low) are expected to reduce the productivity of land. To take into account nonlinearities in the relationship between average rainfall and crop productivity, we take the square value of the moving average of precipitation. We call that variable, *Poor Weather*. When *Poor Weather* takes high values, agricultural producers faced negative economic shocks. On the contrary, low values of *Poor Weather* are expected to approximate favorable crop conditions for agricultural producers. In models 2 to 5, we treat POOR WEATHER as a modifying variable which only magnifies or reduces the effect of income inequality, the main factor affecting the bargaining power of the landed elite.

Our different specifications use moving averages of different length. Model 2 uses a 4-year moving average, which is the standard term limit duration. Model 3 uses a 5-year moving average as a robustness check. Model 4 includes a 10-year moving average to account for longer periods of rainfall shocks.

The models presented in Table 3 present various tests of the economic hypotheses of income tax adoption. These models build on the specification of Model 2 in Table 1, where a lagged variable for WAR was considered. Model 1 in Table 3 simply adds a slow time-variant measure of economic inequality, our main proxy of landed elite bargaining power. We find that increases in landholding inequality increase the probability of adoption of income taxes. Models 2 to 5 explore the consequences of exogenous changes in agricultural productivity on the adoption of income taxes. To this end, we interact measures of landholding inequality with a variety of measures that proxy changes in agricultural conditions. The main effect of inequality indicates the average effect of inequality when precipitation conditions over the last 4, 5 or 10 years are good . In such circumstances, we expect the old elite to have more bargaining power vis-à-vis the new elites. When their pockets are full, they can mobilize resources to get this law passed. Consistent with this intuition, the coefficient for this variable is positive and statistically significant.

For the same token, we expect the coefficient of the interactions to be negative. When precipitation conditions are poor over long periods of time, we expect landed elite to lose bargaining power in Parliament. The interaction coefficient for models 2 and 4 (four-year and ten-year moving average) are negative and statistically significant, consistent with the hypothesis. On the other hand, the interaction of model 3, where a five-year moving average is used instead, is negative but not significant. This difference between contiguous years might sug-

[9] Political resources might take different forms: one is political mobilization. When agricultural conditions are good, farmers do better and are more likely to align with landed elites against the urban interest. Transfers are another realization of political resources. When the pockets of landed elites are full, they can use their wealth to buy favors from urban elite representatives in Parliament. In both cases, the capacity to pass an income tax law should be larger.

TABLE 3: Economic motives of the Adoption of the Income Tax

	(1)	(2)	(3)	(4)
Franchise	-0.112***	-0.116***	-0.101***	-0.109***
	(0.027)	(0.035)	(0.027)	(0.036)
Polity	-0.338**	-0.428*	-0.434**	-0.394**
	(0.159)	(0.222)	(0.192)	(0.165)
Land Inequality	0.118***	0.136***	0.126***	0.140***
	(0.031)	(0.042)	(0.034)	(0.037)
Poor Weather$_{4y}$		1.667		
		(1.077)		
Land Inequality × Poor Weather$_{4y}$		-0.049*		
		(0.029)		
Poor Weather$_{5y}$			2.070	
			(2.504)	
Inequality × Poor Weather$_{5y}$			-0.061	
			(0.054)	
Poor Weather$_{10y}$				7.584
				(5.665)
Land Inequality × Poor Weather$_{10y}$				-0.204*
				(0.119)
War	2.237*	2.076*	2.323	2.185
	(1.192)	(1.230)	(1.694)	(1.370)
Temporary Tax	-4.773*	-5.928	-5.925*	-5.384*
	(2.806)	(3.677)	(3.200)	(2.929)
Local Tax	6.971***	6.574***	5.772***	6.732***
	(1.765)	(1.755)	(1.509)	(2.384)
ln(Population)	1.375***	1.305**	1.273***	1.508**
	(0.467)	(0.514)	(0.428)	(0.607)
ln(GDP/cap)	7.049***	8.955**	8.497***	7.796***
	(2.706)	(4.149)	(3.083)	(2.494)
Urbanization	-2.025*	-2.187*	-2.449**	-2.301***
	(1.061)	(1.167)	(1.070)	(0.876)
Intercept	-8.045	-5.316	-5.238	-8.250
	(5.457)	(5.372)	(4.751)	(5.055)
N	629	629	629	629

All models include a third-order flexible polynomial of the number of years elapsed without the income tax to model duration dependence, and a first lag of War. Robust, country-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

gest that the models are not robust enough. However, it is worth mentioning that the main effect of inequality remains significant, what indicates a strong positive relationship between agriculture productivity and income tax adoption. Overall, the results of these specifications lend support to our central expectation that the probability of income tax adoption is higher when landed elites have greater economic bargaining power.

Did the income taxes that were adopted by countries with high inequality in landholding and low levels of suffrage include more favorable policy conditions for the owners of fixed assets? A brief examination of the provisions of income taxes adopted by these countries lend support to the economic hypothesis. The 1842 income tax adopted in Britain *de facto* replaced the tax on land and, as such, imposed no additional tax burden on landed elites. The income tax adopted by Austria in 1849 also exempted land and buildings, but imposed a rather progressive rate of taxation on profits and other professional incomes. The latter tax rate rose to 20% during the first years of existence of the new tax (Kennan, 1910; Seligman, 1911). The Italian income tax adopted in 1864 did not tax incomes derived from the ownership of land, but taxed profits and capital investments.

To assess whether income taxes adopted by countries with high levels of landholding inequality disproportionately favored owners of fixed assets, we can also examine evidence of the share of income taxes paid by owners of different factors. We can conduct such an analysis for countries with scheduled income taxes that recorded the sources of various tax revenues collected by the income tax. The UK schedule system provides a convenient setting to examine these questions. The 1842 income tax in the UK was levied under five different schedules. Two of these schedules (A and B respectively) collected income from the traditional sectors: income from land, real estate and agriculture. Schedule D, by contrast, collected income from profit and liberal professions. In the 1840s decade, 51.8% of total revenue came from schedules A and B, as compared to 29.4% from schedule D (First Report of the Commissioners of Inland Revenue on the Inland Revenue, 1857). At first glance, one would see no harm done by the new law to the industrial elite. However, the incidence of the tax turned out to be unfavorable to the latter. Figure 3 represents the average tax rate for each of these two sectors for the first 10 years of the law.

The value of assets in the traditional sectors doubled that of the modern sector (Parliamentary Papers, 1861). That explains why revenue stemming from them should surpassed the modern sector. However, keeping the value of the assets constants, the effective tax rate for the modern sector was 30% larger than the rate charged on the traditional sector.[10] Thus, from its very inception, the incidence of the income tax fell more heavily on the modern sector. Eventually, total tax revenue from schedules A and B was surpassed by that of schedule D too. By 1907, the weight of income raised from schedules A and B accounted from 25.8 percent of the total tax revenues raised by the income tax, as compared to the 59 percent accounted by schedule D (Daunton, 2001, table 7.2).

Altogether, the British experience illustrates how the short- and long-run distribution of fiscal responsibilities among owners of fixed and mobile factors are consistent with the hypothesized preferences of the owners of immobile assets at the time the new income tax was adopted. Industrial elites became the main contributor of the

[10] The absolute values of the tax rate and their difference might seem marginal for modern standards. However, these rates were considered high by the time and caused heated debates in Parliament precisely because it tapped previously unknown income and had major distributive consequences. Interestingly, by law all sectors were required to pay the same tax rate: 7d in the pound on income of 150 l. and upwards (on average, that represented a 2.9% tax rate). In practice, the fine print usually benefited those individuals with an economic interest in the traditional sectors. For instance, when income arose under different schedules, the abatement was allowed preferably from the amounts reported in schedules D and E (Kennan, 1910). Landed elites, in essence, were exempted from paying taxes for their activity in the newer sectors.

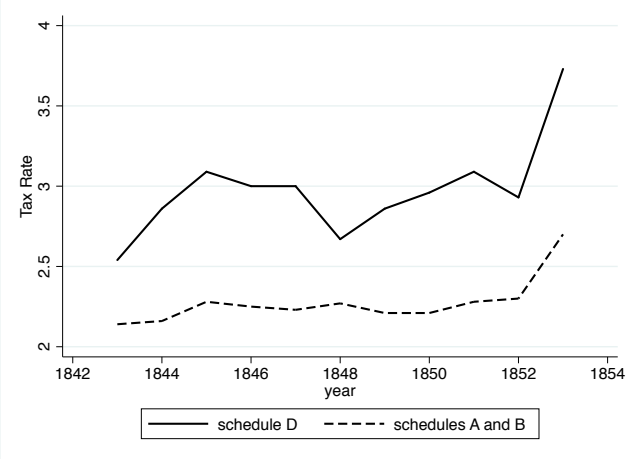

FIGURE 3: Tax Rate of the Traditional sector (dashed curve) and Modern sector (solid curve). The rates represent the ratio of actual tax collection to total assessed value of assets cataloged on schedules A and B (Traditional sector) and D (Modern sector). Source: Parliamentary Papers (1861) and Parliamentary Papers (1857).

new income tax. To provide additional evidence, the Appendix includes a roll call vote analysis of the income tax adoption in the UK in 1842. This additional test illustrates using individual-level data that partisanship and sectoral alignments in the British Parliament were consistent with the economic hypothesis.

A test of the political hypothesis of income tax adoption

Electoral rules varied significantly among European countries during the period prior before each country adopted universal suffrage. We have formulated a number of hypotheses highlighting the consequences of these differences in the design of electoral rules and how they affected the calculations of higher income voters about the desirability of the new tax. In particular, we have explored the effects of two types of restrictive electoral rules which were in place in nineteenth century Europe prior to the adoption of universal suffrage: tax-based censitary rules and the vote-tax link.

We have hypothesized that censitary electoral rules and the vote-tax link affected the calculations of owners of different types of assets about the desirability of income taxes. Specifically, we expect both electoral provisions to maintain the political advantage of incumbent elites (either landed or urban), all else constant.

To test for the political hypothesis, we have constructed two additional variables that code differences in electoral systems among European countries during the period prior to the adoption of income taxes. The first variable *Link*, takes the value 1 if the national electoral system uses the payment of taxes to restrict electoral rights of low income voters. The second variable, *Censitary*, takes the value 1 when tax-based censitary electoral rules are in place for the national Parliament. We have coded these variables using information presented in Caramani (2000), Flora (1983) and Nohlen and Stöver (2010).

In Table 4, we present three additional models that examine the effects of restrictive electoral institutions on the probability of adoption of income taxes. These models build on the specifications presented in Table 3, by adding the variables measuring differences in electoral rules. Model 1 indicates that *Link* facilitated the adoption of the income tax. The coefficient is positive and statistically significant. Model 2 suggests that tax-based *Censitary* rules were only weakly conducive to the adoption of the tax. Its coefficients holds the expected positive sign but it does not reach conventional levels of statistical significance.

The political motives hypothesis is partic-

TABLE 4: The Political Motives of the Adoption of Income Taxes.

	(1)	(2)	(3)
Franchise	-0.106***	-0.138**	-0.149**
	(0.032)	(0.066)	(0.066)
Polity	-0.326**	-0.328*	-0.077
	(0.162)	(0.170)	(0.227)
Land Inequality	0.123***	0.137**	0.163***
	(0.036)	(0.055)	(0.049)
Link	1.059*		-1.887
	(0.571)		(1.874)
Censitary Rules		2.275	
		(3.104)	
Link × Polity			-1.498*
			(0.853)
War	2.331*	1.926**	2.060
	(1.284)	(0.942)	(1.367)
Temporary Tax	-4.374	-4.886*	-1.929
	(2.968)	(2.966)	(3.630)
Local Tax	7.120***	8.753*	10.872**
	(2.142)	(4.540)	(5.170)
ln(Population)	1.346**	1.940	2.007*
	(0.537)	(1.249)	(1.199)
ln(GDP/Capita)	6.744**	7.532**	4.215
	(2.679)	(3.250)	(2.977)
Urbanization	-1.651	-1.376	-0.976
	(1.392)	(1.229)	(1.118)
Intercept	-10.056	-10.952	-24.353*
	(6.716)	(8.714)	(14.618)
N	629	629	629

All models include a third-order flexible polynomial of the number of years elapsed without the income tax to model duration dependence, and a first lag of War. Robust, country-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

ularly designed for non-democratic settings. We claim that an underlying motif of the permanent adoption of the income tax in pre-democratic Europe might be the exclusion of middle and working classes. By attaching a monetary cost to political participation, the vote-tax link would intentionally preclude lower income strata from the electoral arena. Model 3 handles this hypothesis more accurately. Specifically, we test whether the facilitating effect of the vote-tax link on the adoption of income taxes is higher the less democratic the country. For that purpose, we interact *Link* and the *Polity* score. The best way to interpret the results of Model 3 is by plotting the predicted probability of the adoption of the income tax in presence of the vote-tax link for the full range of the *Polity* score.

Figure 4 plots two curves: the solid one describes the predicted probability of adopting the income tax in presence of the vote-tax link. The dashed curve plots the probability in absence of this electoral provision. We observe how the probability of adopting the income tax under non-democratic settings is higher whenever the vote-tax link is in place. As the country becomes more democratic, the vote-tax link becomes inconsequential (the confidence interval of both curves overlap).[11] This evidence suggests that the vote-tax link and more generally, the exclusion of middle- and working-class, might be a strong motif for the adoption of the income tax in pre-democratic Europe, other things constant (among them, *War*). Indeed, this result should help us to understand why non-democracies were early adopters of what eventually became a democratic tax, under which income was redistributed from the wealthy (and powerful) to the poor (and powerless).

In combination, these findings suggest that electoral institutions in non-democratic settings affected political calculations about the desirability of income tax adoption. We find support of our hypothesis suggesting that the vote-tax link modified the calculations of political insiders about the desirability of an income tax. The presence of the vote-tax link to political participation did increase the probability of adoption of an income tax. By contrast, the presence of censitary electoral rules did not significantly increase the probability of income tax adoption.[12]

CONCLUSION

The adoption of the income tax has paved the way for a dramatic increase in the size of government expenditures and represents a decisive turning point in the evolution of the modern state. The political decision to assess taxes on income gave governments the means to tap into a variety of revenues that had been hitherto not assessed. The adoption of the income tax also went hand in hand with the development of additional institutions that sought to assess income that originated from various sources and ensure compliance of citizens with their tax obligations. This paper seeks to provide an explanation of this decisive turning point in the development of the modern fiscal state.

Existing explanations stress the importance of war as factor accounting for the evolution of the modern state. We reconfirm this long-standing result of the literature in our paper. However, wars and preparations for armed military conflicts are not sufficient in explaining political decisions to adopt income taxes. The calculations of political elites about the desirability of the instruments of revenue extraction were affected by domestic economic conditions, on the one hand, and by existing electoral rules, on the other hand. We provide a set of hypotheses about the most decisive economic and political factors that affected the considerations of politicians about desirability of the adoption of a new income tax adoption. We test these hypotheses, by examining the variation in the timing of income

[11] The interval of the parameter space for which the vote-tax link has an effect is non-empty: 24% of country-year observations have Polity scores below -5.

[12] One possible explanation might lie in the seldom use of tax-based censitary rules in Europe as compared to the vote-tax link. This might be an possible cause for the lack of statistical power of this estimate.

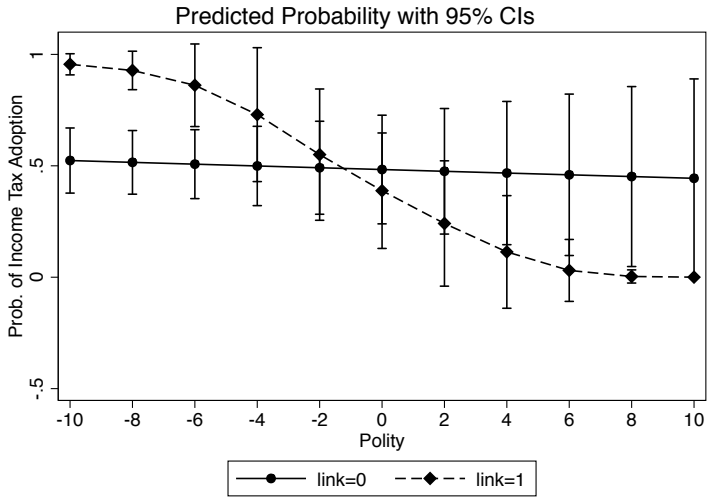

FIGURE 4: Predicted Probability of the Adoption of the Income Tax for the full range of Polity score and the two values of the Vote-Tax Link.

tax adoption across Europe during the period between 1815 and 1939.

Our paper identifies two empirical regularities in the timing of income tax adoption across European countries during this period. We find that countries with high levels of inequality and low levels of suffrage pioneered the adoption of the new income tax. These findings challenge a widely held proposition which suggests that democratization spurs fiscal redistribution. The theoretical expectations of standard models of taxation and redistribution do not hold in this important policy domain. To account for these empirical regularities, we examine the calculations of higher income individuals in countries with restrictive electoral rules about the desirability of the new tax. We suggest that owners of fixed and mobile assets will have different expectations about their future tax liability under the new income tax. While owners of fixed assets supported the income tax because of the ability of the latter to roll off a higher tax burden on owners of mobile assets, mobile asset holders were likely to resist the latter. Our empirical analysis confirms this hypothesis, which posits the existence of a sectoral conflict over the adoption of an income tax. We find that both structural and short-term economic factors that increase the economic bargaining power of landed elites increased the probability of income tax adoption.

In many of the early adopters of income taxation, political negotiations about the introduction of a new income tax took place in environments characterized by very restrictive electoral rules. The electoral rules among these non-democratic countries varied significantly in their institutional design. In our final part of the paper, we examine the effects of two types of electoral rules that were in place in many European countries prior to the adoption of universal suffrage - censitary electoral systems and the vote-tax link - on the calculations of incumbents about the desirability of the new income tax. We find that the presence of a vote-tax link increased the probability of income tax adoption in non-democracies, but detect no effect of censitary electoral rules on the probability of income tax adoption.

The findings in our paper open up interesting avenues of future research for the politics of taxation and redistribution in non-democratic regimes. Our findings suggest that existing models of redistribution operate with assumptions about preferences for taxation that are too simplistic and that overlook important sources of cleavages political incumbents in countries with limited electoral suffrage. We leave it to future research to examine whether the surprising support of owners of high fixed assets for

policies with high redistributive potential such as the income tax can be also found in the case of other policy areas.

APPENDIX 1

In this Appendix we include an analysis of the final roll call in the British Parliament relative to the adoption of the income tax.

The third and last reading of the Income Tax was held on May 31, 1842. This roll call for the adoption of the income tax was voted in Westminster by 404 MPs.[13] We have tracked down 367 of them (91%), representing English, Welsh and Scottish constituencies. For each of these MPs we have coded individual-level characteristics about their biographies and the districts they represented. The biographical data comes from the William O. Aydelotte dataset (1984), which includes socio-economic variables of all MPs for the period 1841 to 1847.[14] In addition to the biographical characteristics of the MPs, we have matched all MPs to a battery of socio-economic indicators of the districts they represented. For this purpose, we have used data from the 1831 UK Census, as coded by Southall et al. 2004.[15]

The UK is the only early adopter of the income tax that had no *vote-tax link* for the national election at adoption time. Therefore, we only test for the economic hypothesis. If the hypothesis is correct, rural representatives are expected to support the adoption of the income tax. By contrast, the urban, industrial representatives are expected to oppose its adoption.

We can measure rural interest in different ways. We can simply rely on the partisanship of the MP. That is probably the most reliable indicator of landed interest, as conservatives were very strong in the rural districts while liberals in urban areas (Aydelotte, 1977, Table 7.1). Alternatively, we can include a simple dummy for rural/urban district. We can also compute a ratio of the total population working in rural and urban activities. Finally, we can also use Aydelottes Guttman Scale on *landed interests*. The latter scale is based on the behavior of each MP in 9 different roll call votes affecting landed interests in the 1841-1847 session.[16]

As we can observe in Table A1-1, all measures work in the expected direction. Liberal MPs opposed the income tax adoption (93% of them did), as did representatives from boroughs (as opposed to counties). The *old-sector* ratio indicates the number of individuals hiring laborers for agriculture (self-employed farmers are thus excluded, although results do not change when we include them) to total district population. The *new-sector* ratio, on the other hand, indicates the number of individuals employed in retail trade, liberal professions (including bankers) and manufacturing industry to total district population. The higher the old-sector ratio, the more likely its representative is to vote in favor of the income tax adoption. To the contrary, the more individuals work in the new-sector activities in a given district, the lower the likelihood of its representative to support the income tax bill. Finally, the Aydelotte *landed interest scale* based on the composite MP behavior over the 1841-7 session is also a strong predictor of support for the income tax. That is, the more an MP aligns with landed interests in other bills, the higher the chances he also votes in favor of the income tax.

The only difference between the four models in Table A1-1 is the effective sample size: the variables that compose the *old-* and *new-sector* employment ratios are only available for England and Wales. Unlike the other three indicators, which are drawn from Aydelotte database, these two ratios are constructed from the 1831 British Census, which covers England and Wales only. Thus, the 66 Scottish districts are lost. On top of that, we cannot match the parish data to the legislative boundaries for some of the

[13] Parliamentary Debates. 1842. *Third Reading of the Income Tax*. Hansard's Parliamentary Papers, Third Series. 5 Victoriae, 1832. vol. LXIII. p.1048.

[14] Aydelotte, William O. 1984. *British House of Commons Roll Call Data, 1841-1847*, Inter-university Consortium for Political and Social Research (ICPSR), SN: 7384, http://dx.doi.org/10.3886/ICPSR07384.v1.

[15] Southall, H.R. et al. 2004. *Great Britain Historical Database : Census Data : Parish-Level Population Statistics, 1801-1951*. Colchester, Essex: UK Data Archive [distributor], SN: 4560, http://dx.doi.org/10.5255/UKDA-SN-4560-1.

[16] For details, refer to the original Aydellote codebook cited in the previous footnote.

TABLE A1-1: Testing for the Economic Hypothesis in the Adoption of the Income Tax in the UK. Benchmark models. Logistic Model of the May 31, 1842 Roll Call Vote.

	(1)	(2)	(3)	(4)
Liberal	-6.348***			
	(0.539)			
City		-1.952***		
		(0.289)		
Old Sector Employment			13.538***	
			(3.855)	
New Sector Employment			-3.917***	
			(1.122)	
Landed Interest Scale				0.498***
				(0.047)
Intercept	3.701***	2.019***	0.425**	-7.260***
	(0.414)	(0.258)	(0.181)	(0.630)
N	385	385	309	385

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

remaining British and Welsh districts. Altogether, the sample size reduces by 20% when we use the occupation ratios to predict landed interest. In the remaining tests, where we test for the effect of potential confounding factors, we focus on the other three indicators to maximize statistical power.

Table A1-2 controls for a series of potential confounders based on personal interest. According to the economic hypothesis, MPs with a vested interest in business activity (*business interest*) should have a lower probability to adopt the income tax.[17] Column 1 in Table A1-2 does not move along this expectation. However, when we restrict attention to the flourishing financial market (a specific subset of *business interests*) we do find a strong opposition to the adoption of this new tax that tapped into previously undeclared income. Column 3 in Table A1-2 adds a variable indicating whether the MP possessed a nobility title (another proxy for landed aristocracy). The coefficient for this variable is again positive and statistically significant. Finally, Model 4 in Table A1-2 adds a measure of the MP personal wealth. This is a nine-category variable, ranging from $< £2,000$ to $> £1,000,000$. This variable positively predicts the adoption of the income tax. This is indeed consistent with the sectoral redistribution hypothesis, as landed elites were richest among rich in 1842 Britain.

Table A1-3 adjusts for the socio-economic conditions of the MPs district. Specifically, columns 1 and 2 add two different measures of the district aggregate wealth. The first one is total population, the second one is population density, computed here as the ratio of population to total houses in the district. Total population per district is coded from the 1831 census. Total housing is coded from multiple Parliamentary sources.[18] None of these two variables is statistically significant. But more importantly, they do not affect the association between

[17] Aydelotte database includes a battery of items indicating whether MPs had invested in different types of business.

[18] PP 1830-1 (202), *Account of Number of Houses in Cities, Towns and Counties in England, Wales and Scotland returning and not returning Members to Parliament*, vol.X.9; PP 1831-2 (92) *Return of 120 Boroughs enumerated in Paper II*, vol. XXXVI.31; PP 1831-2 (126) *Further Return of 120 Boroughs in Paper II*, vol. XXXVI.91; PP 1831 (68) *Further Information as to Amount of Population, and Number and Value of Houses, in Towns and Districts sending Members to Parliament*, vol. XVI.81.

TABLE A1-2: Testing for the Economic Hypothesis in the Adoption of the Income Tax in the UK. Controlling for MPs Biographical Information. Logistic Model of the May 31, 1842 Roll Call Vote.

	(1)	(2)	(3)	(4)
Liberal	-4.718***	-4.702***	-4.814***	-5.583***
	(0.590)	(0.593)	(0.569)	(0.940)
City	-1.215**	-1.223**	-1.178**	-1.149
	(0.572)	(0.587)	(0.576)	(0.715)
Landed Interest Scale	0.227***	0.227***	0.242***	0.196**
	(0.060)	(0.058)	(0.064)	(0.080)
Business Interests	-0.015		0.348	-0.506
	(0.819)		(0.828)	(0.868)
Banking Interests		-0.714*		
		(0.385)		
Nobilty Title			1.233**	1.273*
			(0.560)	(0.713)
Personal Wealth				0.394*
				(0.216)
Intercept	0.086	0.129	-0.720	-1.284
	(1.156)	(1.130)	(1.237)	(1.767)
N	385	385	385	322

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

partisanship and landed interest with roll call vote positioning.

In Model 3 and 4 of Table A1-3 we add two proxies for potential social grievances, which might be driving the adoption of the income tax according to golden standard in the democratization literature. These two proxies are: the unemployment rate and the poverty rate. Both variables are drawn from the 1831 British Census, which surveys England and Wales only (that explains part of the reduction of the sample size). In addition to the Census data, the second measure, the poverty rate, required information from the poor relief programs. These were coded from the Parliamentary Papers.[19] Specifically, the poor rate indicates the ratio of individuals benefiting from the poor relief programs to district population. None of these measures seem to predict the support for the adoption of the income tax. In other words, social grievances do not seem to drive fiscal innovation in the UK. More importantly, the main association between partisanship and landed interests with the support for income tax adoption remains unaffected once we control for potential social grievances.

All in all, the roll call vote analysis for adoption of the income tax in the United Kingdom suggests that landed elites had a strong interest in adopting the income tax. Urban elites did not. This qualitative evidence seems consistent with the economic hypothesis, by which the adoption of the income tax could be instrumentalized by the landed elites as a mechanism of sectoral distribution.

[19] PP 1844 (241), *Return of Average Annual Expenditure of Parishes in each Union in England and Wales; Amount expended in Relief and Maintenance of Poor, 1841-43*, vol. XL.21.

TABLE A1-3: Testing for the Economic Hypothesis in the Adoption of the Income Tax in the UK. Controlling for District Characteristics. Logistic Model of the May 31, 1842 Roll Call Vote.

	(1)	(2)	(3)	(4)
Liberal	-4.815***	-4.628***	-4.588***	-4.859***
	(0.567)	(0.607)	(0.634)	(0.691)
City	-1.127**	-1.136*	-1.209	-1.535*
	(0.535)	(0.659)	(0.770)	(0.874)
Landed Interest Scale	0.243***	0.265***	0.276***	0.251***
	(0.065)	(0.066)	(0.065)	(0.071)
Business Interests	0.325	0.588	-0.256	-0.140
	(0.812)	(1.045)	(1.237)	(1.074)
Nobilty Title	1.230**	1.175**	1.350**	1.446**
	(0.568)	(0.582)	(0.646)	(0.682)
ln(Population)	0.027			
	(0.276)			
Population Density		-0.003		
		(0.004)		
Unemployed Rate			-8.670	
			(5.778)	
Poverty Rate				1.471
				(2.669)
Intercept	-1.040	-1.258	-0.808	-0.718
	(3.243)	(1.258)	(1.359)	(1.518)
N	382	299	274	331

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

APPENDIX 2

Following Carter and Signorino (2010), models in Tables 1, 3 and 4 include a flexible third-order polynomial of the years without income tax to model duration dependence. Alternatively, we could model dependence fitting natural cubic splines together with the time under risk of adopting the income tax (Beck, Katz and Tucker, 1998). This is in fact the way Aidt and Jensen (2009) approach this problem. Table A2-1 reports three specifications using this alternative method to model duration dependence. The first model tests the effect of franchise, the second one the economic hypothesis, and the third one the political hypothesis. The sign and significance of the key coefficients for each hypothesis (i.e. *franchise*, *land inequality* and the *vote-tax link*) are similar to those in Tables 1, 3 and 4. In other words, the results are not model dependent.

TABLE A2-1: Modeling Income Tax Adoption with Cubic Splines.

	Benchmark (1)	Economic Hyp. (2)	Political Hyp. (3)
Franchise	-0.083***	-0.114***	-0.108***
	(0.016)	(0.035)	(0.039)
Polity	-0.346	-0.347*	-0.357
	(0.261)	(0.204)	(0.223)
Land Inequality		0.105***	0.117**
		(0.041)	(0.048)
Link			1.546**
			(0.740)
War	2.488	2.986	3.097
	(1.739)	(2.004)	(2.129)
Lagged War	1.587	1.997	2.110*
	(1.316)	(1.267)	(1.235)
Temporary Tax	-2.301	-3.349	-3.155
	(2.860)	(2.347)	(2.409)
Local Tax	3.385***	7.002***	7.205**
	(1.271)	(2.702)	(2.940)
ln(Population)	1.536**	1.831**	1.834**
	(0.736)	(0.739)	(0.840)
ln(GDP/cap)	6.181	7.281**	7.504**
	(4.037)	(3.122)	(3.309)
Urbanization	-1.461	-2.642*	-2.137
	(1.748)	(1.353)	(1.779)
Intercept	1.848	-8.721	-10.873
	(5.801)	(7.977)	(8.515)
N	637	637	637

All models include three cubic splines (fitted with three knots) to model duration dependence as well as a counter of the number of years without the income tax. Robust, country-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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