QOG

UNIVERSITY OF GOTHENBURG

THE EARLY MODERN ORIGINS OF CONTEMPORARY EUROPEAN TAX SYSTEMS

MICHELLE D'ARCY

MARINA NISTOTSKAYA

WORKING PAPER SERIES 2016:6

QOG THE QUALITY OF GOVERNMENT INSTITUTE
Department of Political Science
University of Gothenburg
Box 711, SE 405 30 GÖTEBORG
March 2016
ISSN 1653-8919

The Early Modern Origins of Contemporary European Tax Systems
Michelle D'arcy
Marina Nistotskaya
QoG Working Paper Series 2016:6
March 2016
ISSN 1653-8919

ABSTRACT

What explains variation in tax outcomes? Many studies emphasize the role played by institutions, focusing on those of relatively recent times. We argue that contemporary tax systems have deeper institutional origins in the early modern period when states undertook reforms to centralize and rationalize taxation. We argue that the varying outcomes of these reforms map onto contemporary tax outcomes through the mechanisms of state capacity and social norms. Where states succeeded in introducing more comprehensive reforms they developed higher capacity to extract more tax, more equitably, and developing direct fiscal contracts with social groups below elites, fostering norms of trust. We test our argument using the extent of cadastral registration of land in the early modern period. We find that on average countries where reforms were more extensive have higher tax revenues, state capacity and trust in state authorities today than countries with limited early modern tax reforms.

Michelle D´Arcy
Trinity College Dublin
darcym1@tcd.ie

Marina Nistotskaya
The Quality of Government Institute
Department of Political Science
University of Gothenburg
Marina.nistotskaya@gu.se

The recent fiscal crises in some European countries have again made clear the stark differences between these states in terms of their fiscal sustainability. While most existing accounts of divergent tax outcomes explain these patterns in terms of institutional differences dating from the modern period – regime type, constitutional structure, electoral systems, parties and industrial relations – some contemporary tax systems bear a striking resemblance to their predecessors in the early modern period, as illustrated by the contrasting examples of Sweden and Greece.

Sweden is often seen as one of the strongest and most stable tax states, able to collect tax from its citizens and use this money to fund a substantial welfare state. According to Steinmo, "the hallmarks of the Swedish tax system have been its broad base, its stability and its high yield" (1993, 41). While his explanations for this impressive tax performance focus on the institutional framework established in the last one hundred years, the modern Swedish tax state is remarkably similar to that of the early modern period. From the 1530s onwards, the Swedish state began replacing medieval fiscal systems, where elites were used as intermediaries, with a centralized, rationalized system of taxation administered by state officials that was capable of extracting high levels of resources from the bulk of the population. As an innovator in establishing centralized tax records and creating the first nation-wide cadastral map by surveying individual land parcels, the state had acquired the information necessary to directly "supervise and scrutinize the peasants" (Lindkvist 1987, 62). With this formidable fiscal monitoring capacity the Swedish state had created a broad-based tax system that could extract taxes, both in cash and in kind, from a relatively poor economy, sufficient to support one of the largest standing armies in Europe (Tilly 1992, 59) and to become an imperial power in mainland Europe. In the early modern period Sweden was already one of the most impressive tax states.

By contrast, contemporary Greece is one of the weakest tax states among the advanced European states. In the 1600s when Sweden was developing centralized, broad based taxation, in Greece, then part of the Ottoman Empire, taxes were collected through extensive use of tax farming (Balla and Johnson 2009). Tax farmers, members of the elite who were not state officials, paid the state up front and any additional revenue collected was kept as profit.[1] This system persisted for the next three hundred years. It was not until the nineteenth century that the Ottomans undertook reforms. However, as Greece became independent in 1833, it missed the introduction of the Ottoman Land

[1] For an overview of the variety of tax collection methods under tax farming see Coşgel and Miceli 2009.

Code of 1858, which required the state registration of land. Since independence, the state has faced persistent budget deficits and a high debt-to-GDP ratio (Lazaretou 2014). Greece still does not have comprehensive land and property registration systems (Markatos 2014). Taxation is "the essential function that makes government possible and the one that the modern Greek state has never quite mastered in almost two centuries of existence" (Palaiologos 2014, 32).

The points of continuity between the early modern and contemporary Swedish and Greek tax states raise questions about how far back we need to look to explain the variation in tax outcomes between European states. This paper analyzes to what extent, and in what ways, early modern tax systems in European states explain the variation in contemporary tax outcomes. In the early modern period the rulers of European states were engaged in efforts to reform fiscal systems. We contend that the extent to which reform happened in the early modern period had consequences for how much tax was collected, the distribution of the tax burden, the strength of the state and the relationship between the majority of the population and the state. We argue that where states began collecting tax directly they developed stronger states, capable of extracting more tax, more equitably, and developing direct fiscal contracts with social groups below elites, fostering norms of trust in the state. On the basis of these arguments we predict that the outcome of early modern tax reforms have an effect on contemporary tax outcomes through the mechanisms of state capacity and social norms, particularly trust in the state. We test our argument using a new measure of the extent and quality of state-administered cadastral records of land, which taps into the timing, extent and depth of tax reforms. Our analysis suggests that on average countries where tax reforms were undertaken earlier and more comprehensively have higher tax revenues, stronger state capacity and higher trust than countries where reform was more limited.

We contribute to the existing literature in three ways. First, we add a new explanatory variable to existing explanations by focusing on institutional development in the long run and emphasizing the importance of the early modern period. Second, we suggest theoretical mechanisms for how institutional legacies in the area of taxation might persist – state capacity and social norms. Third, we test our hypotheses with a new measure of the extent and quality of state-administered cadastral records that taps into the success of tax reforms in the early modern period.

The paper proceeds as follows: in the next section we review the literature on modern tax systems, which focuses on the micro-behavioral foundations of compliance in societal norms and macro-institutional environment, particularly recent institutional characteristics. We then discuss taxation in the early modern period, drawing on the very rich literature which has analyzed the formative relationship between taxation, state-building and state-society relations in this period. We use this as the backdrop for a theoretical discussion that puts forward testable hypotheses. We then describe our data and empirical strategy and the results of the analysis. We conclude by considering the implications of our argument for the fiscal sustainability of contemporary European states.

Existing Explanations of Contemporary Tax Outcomes

Many classic works in the social sciences have addressed the variation in tax outcomes. Beyond the basic economic variables that clearly matter – the size and structure of the economy – the literature has focused on two main areas: the micro-behavioral foundations of compliance related to societal norms and the macro-institutional environment.

In terms of the micro-behavioral foundations of taxation, as originally modeled by economists, compliance was simply a function of the individual's calculation about the probability of being caught evading and penalized (Allingham and Sandmo 1972). However, subsequent empirical studies showed that some countries with low enforcement rates still have comparatively high compliance levels, suggesting that factors beyond deterrence influenced tax behavior (Alm, Sanchez, and De Juan 1995).

In terms of explaining this gap, researchers have put forward a number of explanations. First, the fiscal exchange framework, which envisages a contract between citizens who pay tax and states who provide services in return, maintains that taxpayers "will meet obligations to pay taxes, but only if other taxpayers and the state also meet their obligations to the implicit tax contract" (Scholz 2003, 190). Within this framework the focus has been on the importance of the taxpayers' perceptions that the public goods received are appropriate and of equivalent value to the payments made (Becker et al 1987; Bordignon 1993; Cummings et al 2009; Levi, Sachs, and Tyler 2009) and that other citizens are not shirking on their tax obligations (Castro and Rizzo 2014; Fortin, Lacroix and Villeval 2007; Moser, Evans, and Kim 1995; Scholz and Lubell 1998). Second, in what is known as the "slippery slope" framework, power of and trust in authorities have been at the center of theoretical and empirical investigation of tax behavior (Kirchler, Hoelzel and Wahl 2008). Finally, there are those who have focused on tax morale – the "intrinsic motivation to pay tax" (Torgler 2007, 4) which is determined by a range of individual and system-level factors (Alm and Torgler 2006, Lago-Peñas and Lago-Peñas 2010).

This first literature suggests that much of what determines tax behavior at the micro level is derived from the broader institutional environment, which is the focus of a second literature. At the most basic level the institutional literature has considered the impact of regime type on tax outcomes (Cheibub 1998; Boix 2003; Ross 2004). Beyond regime type studies have found that differences between democracies also matter: majoritarian systems seem to produce less redistribution than proportional systems (Wilensky 2002), and there is also a positive link between leftist parties and higher levels of taxation (Allers, De Haan, and Sterks 2001; Cusak and Beramendi 2006), although left governments may also champion larger tax cuts than right ones (Hallerberg and Basinger 1998, 338). Strong corporatism and unionization also have a positive impact on taxation (Crepaz 1992; Hall and Soskice 2001; Steinmo and Tolbert 1989).

Some of the most influential institutionalist accounts adopt a "whole systems" approach, looking at how institutional structures in their totality affect tax. Steinmo's (1993) influential study argues that institutions structure how power is exercised and thereby provide the context that determines both how policy makers view the choices available to them and how policy will be implemented. States with "centripetal" constitutions (unitary states with parliamentary systems and proportional electoral systems) can collect more tax (Gerring, Thacker, and Moreno 2005). This is congruent with the "number of veto players" argument (Hallerberg and Basinger 1998; Besley and Persson 2014).
The institutionalist literature on modern tax systems often draws on research on taxation in earlier periods that has emphasized the key role tax played in European institutional development, yet the institutions it examines as explanatory variables for current tax outcomes are those that arose in relatively recent times, leaving open questions about the effect of earlier patterns of development.

Taxation in the Early Modern Period

A very rich literature has analyzed the formative developments in taxation, state-building and state-society relations in the early modern period in Europe. According to a classic literature, war created a revenue imperative that required the development of tax and new forms of administration (Brewer 1988; Downing 1992; Ertman 1997; Hintze 1975; Tilly 1990). A more recent literature examining the variation in fiscal outcomes of early modern states in Europe in the context of warfare, highlights an interaction effect between economic structure and political regime type (Karaman and Pamuk 2013), centralized states with representative institutions (Dincecco 2009) and unified and powerful voting institutions (Kiser and Linton 2001). While this literature has contributed richly to our understanding of tax outcomes in the early modern period, a question that is unexplored is how the variation in fiscal capacity that emerged in this period may matter for tax outcomes today. To address it we need to explore the ways in which tax systems were reformed in this period.

Early Modern Tax Reforms

In the early modern period European states began reforming medieval tax systems, with varying degrees of success. Rulers' escalating need for revenue, particularly after the military revolution from 1550 onwards (Tilly 1990; Downing 1992), led to the need to reform systems of taxation. Medieval tax systems involved collective obligations on towns and villages, administered by the local nobility. The state had neither the capacity nor the information necessary to collect taxes directly without using elites as intermediaries (Scott 1998, 38).

The more effective tax systems that emerged in some European countries in the early modern period moved from the medieval system of collective obligations administered by the elite, towards a centralized, rationalized model that used state officials to collect tax directly (Dincecco 2009). These reformed systems had at least three important consequences; for tax levels, the distribution of the tax burden, and the directness of the tax relationship between the state and ordinary people.
First, direct, centralized state-administered systems were more efficient at raising revenue (Dincecco 2009). This was in part because they did not have to negotiate separate rates with different local elites (Dincecco 2009, 51) and in part because of reduced collection losses, as happened for example, in the Ottoman empire of the seventeenth and eighteenth centuries, where central revenues remained low because "more than half… of the gross tax receipts were retained by various intermediaries, most importantly the urban elites in the provinces" (Pamuk 2014, 5; see also Karaman 2009).

Rationalized, centralized tax collection led to not only more tax being collected, but also to a fairer distribution of the tax burden. Feudal taxation was highly unevenly distributed. For example, in France under the pre-Revolutionary *taille* system communities were held collectively responsible for a fixed tax burden. Who paid what was largely at the discretion of local elites who collected the taxes, meaning the tax burden was not always equitably distributed (Schremmer 1989). This was detrimental to both the royal income and to local communities (Touzery 2002, 136). These disparities were a key source of grievance on the eve of the French Revolution (White 1995). Similarly, summarizing a large literature on pre-1800 tax systems in England, Kiser and Kane state that

> "…taxes never adequately tapped subjects' wealth" (2001, 200). Eighteenth century reformers in Italy identified inequalities of taxation "not only between one province and another, or one town and another ... but also among the individual tax-payers in a single village. This was a consequence of the degree to which the power to distribute and collect taxes was in the hands of local administrators who generally had ties to the large land owners that appointed the tax collectors, themselves" (Capra 2002, 129).

Reforms in some countries were explicitly focused on equalizing the unfair distribution of taxation. In France efforts to collect more accurate information on land holdings, the *cadastre parcellaire*, was designed "to be an instrument of government fiscal policy to ensure the fair calculation and apportionment of land tax commune by commune and property by property" (Kain and Baigent 1992, 233). In Italy, reforms in Savoy and Milan took discretionary powers away from traditional authorities and empowered an administration that was "able to guarantee fiscal equality and public wellbeing" (Alimento 2002, 120). In these cases, as in others, the pursuit of centralization was linked to the attempt to decrease the fiscal privileges of elites (Alimento 2002, 122).

A third consequence of fiscal reforms was that it brought ordinary people into direct contact with the state, as opposed to the interface through noble intermediaries under tax farming, allowing a direct relationship to emerge. In Sweden, as the crown had begun collecting tax directly as early as the sixteenth century, "the state bureaucracy extended its monitoring directly to peasants and labourers" (Tilly 1990, 136). Peasants regularly challenged tax assessments, and their grievances were dealt with directly by state officials in a number of ways (Frohnert 2001; Hallenberg 2012, Hallenberg, Holm and Johansson 2008). The essence of the Swedish state, set forth by Gustav Vasa, "was a new fiscal and military organization… But the by-product was a system of interaction that opened up direct communication lines between the King and his subjects" (Hallenberg, Holm and Johansson 2008, 254). By contrast, in the Ottoman empire of the seventeenth and eighteenth centuries,

> "…the tax farmer or his agent was at total liberty to use a multitude of means to realize his objective, and peasants no longer had any way of acquiring real protection against these" (Kasaba 1988, 13).

Thus successful reforms had important consequences for taxation, equity and state-society relations. However, these reforms were not as comprehensive in every state, as rulers faced significant resistance from elites because reforms undercut their social power at the local level and increased their tax burden. Rationalizing and centralizing tax collection involved limiting the fiscal privileges and political "freedoms" of the elite (Alimento 2002, 122), transferring to the state the aristocracy's coercion-based extractive capacity and displacing nobles as the key representatives of the state in the locality (Anderson 1974). As a result these reforms were keenly resisted. For example, in France the Frondes (1648-1653) – a series of armed conflicts between the French Crown and the French nobility – was sparked by the attempts of Louis XIV to limit the privileges of local elites in general and to increase central control of direct tax administration in particular (Chapman 2004 70-72; Kiser and Kane 2010, 203).

As a result of elite resistance, in some states rulers were able to introduce reforms and in others they were not as successful. In Denmark, the king successfully introduced reforms in the 1680s that rationalized taxation, consolidated state revenue and increased the independence of the crown from aristocratic power (Kain and Baigent 1992, 97). In Catalonia, following the War of the Spanish Succession, the crown succeeded in reasserting royal power and imposing new modes of taxation (Camarero Bullón, 2007, 152). In Bourbon Spain, the attempt in 1754 to implement a head tax in Castile was defeated by noble opposition (Black 2008, 97). In England, "throughout the medieval and early modern eras, rulers gave up on developing a centralized system that adequately assessed landed wealth or "movable" assets and accepted fixed lump sum payments collected by locally controlled agents" (Kiser and Kane 2001, 198). In Hungary, Joseph II's attempts to introduce land tax reform, based on a comprehensive land registry, failed following a noble revolt in 1789 during which the records were destroyed (Black 2008, 97). In France, a few significant attempts at reform foundered on the intractable problem of *ancien régime* privilege (Behrens 1963; Touzery 2002, 138-139).

Tax reforms in the early modern period had significant implications for the levels of tax, its distribution and state-society relations but these reforms were not implemented to the same extent in every state. In the next section we explore theoretically how variation in the extent of early modern reforms may have had long-term implications.

Theoretical Discussion

Why should we expect the outcomes of tax reforms hundreds of years ago to impact on fiscal outcomes today? Three bodies of literature support the suggestion that developments in early modern states may have an impact on contemporary outcomes. First, it is supported by the literature on path dependency, which emphasizes the ways in which institutions replicate and persist as the incentives of actors become inscribed within the prevailing institutional structures. The high degree of path dependency in tax systems has been particularly emphasized: "once established, tax systems last until the end of the government that instituted them" (Ames and Rapp 1977, 177). Tax reform is a "revolutionary undertaking" that is inherently politically risky and hence the basic contours of tax systems are preserved for hundreds of years (Kiser and Kane 2001). Second, a growing body of literature emphasizes the long-term impact of early institutions on divergent levels of development today (Acemoglu, Johnson and Robinson 2002; Bockstette, Chanda and Putterman 2002; Michalopoulos and Papaioannou 2013). Third, the fiscal sociology literature discussed above sees the early modern period as formative for European states (Ertman 1997; Tilly 1990). To the best of our knowledge, the impact of the differences that emerged in this period on later tax outcomes has not been tested.

Furthermore, an important question is, 'what are the mechanisms through which early modern tax systems might persist?' Following recent research that has emphasized the persistence of historical institutional legacies through mechanisms of both formal institutions and informal ones - values, beliefs and norms (Becker et al 2015); we investigate two mechanisms that matter for tax outcomes that can require a longer time period to develop: state capacity and social norms.

State Capacity

All European states ultimately reformed their tax systems by moving to direct allocation and collection of taxes by state officials, yet significant differences in tax capacity still exist (Besley and Persson 2014; Prichard, Cobham and Goodall 2014). The first plausible mechanism therefore is that the degree of state capacity acquired during the early modern period persisted through formal institutions.

As Levi has argued, "the history of state revenue production is the history of the evolution of the state" (1988, 1). Where states rationalized and centralized tax systems in the early modern period they increased the "hard power" of the state in terms of bureaucratic and monitoring capacity. As has been well documented, collecting taxes in a rational, centralized way requires bureaucratic development (Brewer 1989). It also requires the state to increase its monitoring capacity. For example, to collect land taxes the state used such innovations as property registers and cadastral maps – large-scale cartographic records of individual land parcels that successfully linked the in-depth information on this key economic asset with their users in a single record. These enabled rulers to rationalize taxation by making the quality and the use of economic assets, as well as their owners (or users), visible to the state (Kain and Baigent 1992). Thus, states had higher infrastructural state capacity where they collected taxes directly, rather than relying on elites.

Relatedly, states that reformed their tax systems in the early modern period developed the ability to broadcast power more evenly over people and territory. The reach of the state is a critical but often overlooked aspect of state capacity. As Herbst has argued, "states are only viable if they are able to control the territory defined by their borders" (2000, 3). The unevenness of state power and quality of government in contemporary European states at the sub-national level has been clearly demonstrated (Charron, Dijkstra and Lapuente 2014) and shown to impact on economic outcomes (Nistotskaya, Charron and Lapuente 2015).

If the outcome of the early modern tax reforms led to differing levels in the extent and strength of state capacity, this may have set states on divergent paths in their development of state capacity (D'Arcy and Nistotskaya forthcoming). Political institutions, particularly those of the state, have been argued to be highly path dependent (Pierson 2000). The resulting differences in the levels of capacity today could then impact on taxation both directly, as it is essential for revenue extraction, and indirectly, as state capacity is necessary for delivering public goods necessary to upholding the fiscal contract (Besley and Persson 2014).

Social Norms

A body of literature suggests that even if formal institutions change or disappear they can have persistent effects through the mechanism of norms (Becker et al 2015; Putnam 1993; Tabellini 2010). Since norms are quasi-inertial forces (Gambetta 1987), they are not necessarily directly reflective of immediate conditions, but rather have evolved over time out of the interactions between states and populations over the *longue durée*. Norms are part of an institutional complex which, as Greif has argued, "is not a static optimal response to economic needs, [but rather] a reflection of an historical process in which past economic, political, social, and cultural features interrelate and have a lasting impact on the nature and economic implications of a society's institutions" (1998, 82). In light of this, the claim that the outcomes of past interactions with the state have an effect today through the mechanism of social norms seems plausible and has been found to have empirical support (Becker et al 2015).

In terms of the social norms that matter for tax compliance, trust in authorities, particularly the authorities responsible for implementation of laws, is argued to have a critical impact (Cummings et al 2009; Levi, Sachs and Tyler 2009; Scholz and Lubell 1998; Wahl, Kastlunger and Kirchler 2010). One of the best theorized mechanisms that links trust in authorities to tax compliance, and citizens' compliance with law in general (Tyler 1990), is procedural fairness or impartiality in the implementation of political power (Rothstein 2005; Rothstein and Teorell 2008).[2] This view is supported by the empirical literature showing that willingness to pay taxes is higher when individuals perceive that tax affairs are administered fairly (Slemrod 1992; D'Arcy 2011).

If we conceive trust in authorities as a norm that emerges over the longer term out of the interaction between the state and citizens, and that it is determined by perceptions of the degree of fairness and impartiality of state institutions, then it seems plausible that the early modern tax reforms may have an impact through this mechanism. As detailed above, the outcome of early modern tax reforms had distributional consequences, and determined whether more direct and fairer (compared to feudal taxation) fiscal contracts between subjects and states emerged. Where tax became more centralized and rationalized the tax burden was distributed more fairly and, though it could

[2] Although some conceptualize trust in authorities as citizens' judgement that the authorities will deliver on their promises, linking it to pro-compliance norms, they also acknowledge their conception of trust as intertwined with procedural fairness (Levy, Sacks and Tyler 2009, 356).

increase, ordinary people were in a better position to negotiate directly with the state. They entered into a direct, vertical fiscal contract. In Sweden, the above-discussed regular interaction between crown officials and the population developed tolerable administration and a situation whereby the state was seen as the proper medium for solving problems from an early stage (Hallenberg 2012; Hallenberg, Holm, Johansson 2008). A direct and fair fiscal contract between the state and society established in the past may then have led to higher levels of trust in authorities, supportive of higher tax compliance today.

The above theoretical discussion informs the following hypothesis, and two sub-hypotheses about the mechanisms:

> H1: all other things being equal, European countries where early modern tax reforms were more comprehensive collect more tax revenues today, relative to countries where such reforms were of a more limited character.

> MH1: all other things being equal, European countries where early modern tax reforms were more comprehensive have higher state capacity today, relative to countries where such reforms were of a more limited character.

> MH2: all other things being equal, European countries where early modern tax reforms were more comprehensive have higher trust in authorities, relative to countries where such reforms were of a more limited character.

Data and Method

Measuring the Outcome of Tax Reforms in the Early Modern Period

There are no existing indicators of tax reform in the early modern period to our knowledge.[3] We construct a new measure of the existence and quality of state-administered cadasters, capturing the timing and extent of tax reforms. A cadaster is a methodically arranged inventory of data concerning land, based on a survey of individual land parcels. As two of the foremost experts of cadastral

[3] Dincecco (2009) creates a dichotomous measure of fiscal centralization for the period 1650-1913, which runs outside our focus on the early modern period and is only available only for eleven countries.

maps explain, "…their essential feature is that they identify property owners, usually by linking properties on a map to a written register on which details of the property, such as the owner's name and its area, are recorded" (Kain and Baigent 1992, xviii). During the early modern period land was a key economic asset and rulers were primarily interested in cadastral maps because they "provide a parsimonious and accurate means of both fairly assessing and permanently recording the tax liabilities of a particular parcel of land" (Kain, 2007, 710). As such they were a key instrument in the state's efforts to reform taxation.

Not all states were able to reform tax systems, as discussed above, because of the resistance of local elites, which included resistance to cadastres. Prior to the state having the information cadastres provided, landlords could misrepresent the amount of land and its yield, therefore minimizing their tax burden and extending their own income. As Scott noted, "the point of the cadastral map and land register was precisely to eliminate the fiscal feudalism and rationalize the fiscal take of the state" (1998, 38). For example, the English state did not manage to introduce centralized direct tax collection in the early modern period (Daunton 2001) and never managed to introduce a comprehensive cadastral map due to the strength of the resistance of the nobility (Kain and Baigent 1992, 343). In contrast, the Swedish crown, with little resistance from weak nobility, began centralizing the tax system in the 1540s, including introducing narrative cadastres and a comprehensive cadastral map of the country in 1628. However, in their Baltic territories the strength of the semi-independent nobility led to a much less effective cadaster (Kain and Baigent 1992, 72). Thus, the presence of an extensive state-administered cadaster is indicative of a state that implemented comprehensive tax reform. As such we consider the extent and the quality of cadastral records to be an appropriate indicator of the extent of tax reform in the early modern period. We use standardized scores of *Cadaster* for easier interpretation of substantive effects.

Constructing the *Cadaster* Indicator

In the light of the above discussion, we created an original indicator *Cadaster* for 42 European countries, including Turkey and Russia, as accepted in the field (Karaman and Pamuk 2013), for the period between 1450 and 1800, a standard definition of the early modern period (Wiesner-Hanks 2006) (Appendix A).

We capture the comprehensiveness of cadasters, our indicator of tax reforms, using two dimensions – its geographic extent and whether it was narrative or cartographic. Narrative cadasters are registers or lists of property recording ownership through verbal description, but without a detailed cartographic/graphical representation such as provided by a map. Cartographic cadasters are given more weight because they are more accurate in terms of measurements of parcels, and are particularly effective in "linking properties on a map to a written register on which details of the property, such as the owner's name and its area, are recorded" (Kain and Baigent 1992, xviii). They give the state more detailed information and are therefore a more powerful tool for taxation.

For each year of the period we assigned a score based on the answers to the following three questions: Was there a state-administered cadaster? Was this cadaster narrative or cartographic? How much of the territory of the modern country was covered by the cadaster?

We allocated points for each year as follows:

0: no cadaster;
0.25: a narrative cadaster, covering less than 75% of the territory of the modern state;
0.5: a narrative cadaster, covering more than 75% of the territory of the modern state;
0.75: a cartographic cadaster, covering less than 75% of the territory of the modern state;
1: a cartographic cadaster, covering over 75% of the current territory. [4]

This coding schema allows us to take into account changes over time and instances of the reversal of tax reforms. For example, from c. 1600 onwards tax farming became the dominant mode of tax collection in the Ottoman Empire, having overtaken the previous tax system, based on state-administered narrative cadasters (*tahrir defterleri*) which fell out of use.[5] Therefore we assigned the countries under Ottoman rule a score of .5 between 1450 and 1599, and 0 between 1600 and 1800.

The resulting indicator is the sum of the weighted scores (figure 1). To illustrate, in Sweden in 1530 rulers began to use narrative cadasters, with coverage of more than 75% of modern Sweden. In

---

[4] Using a threshold for the percentage of the territory covered by the cadastre enables us to deal with the discrepancy, for some countries, between the modern and historical boundaries of the state.
[5] Although the earliest evidence of tax farming in the Ottoman Empire goes back as far as the later fourteenth century (Fleet 2003), the increased use of tax farming is observed in the sixteenth century (Balla and Johnson 2009), making it a dominant form of tax collection between c 1600 and 1858, when the obligatory state registration of land was re-introduced.

1628 the Swedish crown started the first, in Europe, state-administered cadastral mapping of the territory of the state. Therefore, for each year between 1530 and 1628 (98 years) we assigned the score 0.5, and for each year between 1628 and 1800 (172 years) we assign 1. The total weighted score is 221. Sweden has the highest *Cadaster* score, followed by Finland (214) and Netherlands (158.25). On the other end of the distribution there are eight countries with the score of zero, including the UK and Ireland.[6]

The information on cadasters is taken from: the UN-sponsored Cadastral Template Project developed by the International Federation of Surveyors; the Permanent Committee on Cadasters in the European Union; specialized academic literature, especially Kain and Baigent (1992).

Dependent and Control Variables

Although there is no clear consensus on measurement in relation to the tax performance of countries, tax to GDP ratio is the most commonly used as "it allows for effective comparison of cash revenues for the same economy as it grows over time, and across economies of different sizes" (Cobham 2015). In the main specification we use data from the International Centre for Tax and Development (ICTD) by Prichard, Cobham and Goodall 2014. As a robustness check we employ the IMF's government revenues, which is highly correlated in our sample with the ICTD's total tax indicator (r = .95***). We also test the effect of *Cadaster* on direct tax alone, as this tax is one of the most progressive ones, but also most difficult to administer, requiring high state capacity (Lieberman 2002, 99).

We employ three measures capturing contemporary state capacity, including both expert evaluations and public perceptions, and capturing different dimensions of state capacity – both general and specifically related to tax. The first is the International Country Risk Guide's (ICRG) composite measure of quality of public bureaucracy, extent of corruption and law and order, which is customarily used as a measure of state capacity (Bäck and Hadenius 2008; Knutsen 2013). The second is an

[6] We do not give scores for the Munster Survey of 1586 or the Down Survey of 1655 (Ireland). These were state-administered maps of land titles for large landowners, whose intent was not fiscal – they were produced to redistribute lands as part of the broader expansion of British control in Ireland after a failed rebellion in 1579-83the Cromwellian conquest 1649-53. Since the intent of the Domesday Book (UK) of 1086 – whether it was fiscal, legal or multi-purpose – is disputed (for overview see Higham 1993, 8-9), we err on the side of caution and do not assign scores, which sets a harder test for our theory as the assignment of a score for the UK does improve the fit of our model.

indicator measuring corruption in national tax authorities, from Transparency International. The third is perceptions of the efficiency of the tax authority from the 2008 European Social Survey (ESS).

To gauge trust in authorities we use questions from the ESS. First, following Kirchler, Hoelzl, and Wahl (2008), who define trust in tax authorities as "a general opinion of individuals and social groups that the tax authorities are benevolent and work beneficially for the common good" (212), we employ a specific question on the impartiality of tax authorities in dealing with citizens from Round 4. Second, we use the questions on trust in the legal system and police – prominent institutions of the implementation of political power – that were utilized as the key measure of trust in authorities in the previous research on tax compliance (Torgler 2007). Finally, we use a question that asks respondents if they would prefer more tax and more public goods or less tax and less public goods as a proxy of their willingness to enter into a fiscal contract with the state, which is reflective of trust in the state.

Constrained by the number of observations, we employ across all models the four control variables that, according to the literature, control for the other most important determinants of tax: the number of years since the inception of democracy (DEMY), the spatial organization of government (UNITAR), level of economic development (EconDevelop) and its short-term rate of change (GROWTH). Years of democracy and unitarism reflect two major political and constitutional differences among the countries that have been found to be salient institutional factors affecting the tax performance (Gerring, Thacker and Moreno 2005; Melo 2007).[7] The Economic Complexity Index (ECI) is a novel measure of economic development, which is based on the evaluation of complexity and diversification of products in an economy (Hausmann et al 2008). We use this indicator, rather than GDP per capita, as our dependent variables for tax are already normalized by GDP and because it captures the structure of the economy as well as its size, which is important for tax. Most of the variables are measured as averages for several years to limit the impact of yearly fluctuations. Full description of the variables, years of measurement and data sources are provided in Appendix B. Appendix C provides summary statistics.

---

[7] Constrained by the degrees of freedom, we use democracy years to control for both levels of democracy and age of democracy. As our sample is European countries, there is limited variation in levels of democracy, but significant variation in age.

Results

Graph 1 visualizes the bivariate relation between z*Cadaster* and the ICTD's total tax revenue, suggesting that on average the linear relation fits the data well. Table 1 reports the results of the regression analysis of the relationship between z*Cadaster* and tax revenues under all the above-specified controls. Across all three models, the impact of z*Cadaster* is significant at least at the 95% level, and signed as expected: higher values of cadaster are associated with higher tax revenues.[8] The quantitative impact of our measure of the extent of the early modern tax reforms is also substantial: one standard deviation increase in z*Cadaster* is associated with 2 to 3 percent increase in tax revenues on average. Together the predictors explain more than 50% of the variance of the total tax revenue (models 1 and 3) and about two thirds of the direct tax revenues (model 2). We reran the models with GDP per capita as an alternative measure for the levels of economic development and two alternative measures for years of democracy (not reported), and model specification (for example, by controlling for income inequality or ethnic, language or religious fractionalization), finding the results to be largely similar to those reported in the main specifications (Appendix E).

In addition, to control for the argument that more recently developed cadasters may matter more than ones that were developed in the more distant past, we reran all regressions with z*Cadaster's* scores being discounted by 5% for each 50 years between 1800 and 1450 as per the original formula in Bockstette, Chanda and Putterman 2002, who measure the age of the contemporary state. The results are substantively similar to the main analysis (Appendix F). Overall these findings provide strong support for H1 in that those European countries that more comprehensively reformed their tax systems during the early modern period exhibit higher tax revenues today, relative to European countries in which such reforms were less successful.

Testing Mechanisms

Hypotheses MH1 and MH2 relate to the two mechanisms through which the outcomes of early modern tax reforms may be relevant to present day state capacity and trust in authorities.

[8] z*Cadaster* is consistently significant across all model specifications, for details see Appendix D.

Table 2 reports the estimates of three fully specified models of the impact of z*Cadaster* on contemporary state capacity. Across all three models z*Cadaster* is significant and signed in the expected direction. In models 1 and 2, higher values of our key explanatory variable are associated with higher quality of government in general and higher efficiency of tax authorities in particularly. In model 3, higher values of z*Cadaster* are associated with lower corruption in tax authorities. Ranging from 49 to 83 percent, the R^2 evidences the goodness of fit between the models and the data. This analysis provides support to HM1, suggesting that where European rulers implemented more comprehensive tax reform during the period under study, one can observe higher state capacity today.

Regarding the trust in authorities (table 3), z*Cadaster* estimates are significant at the level of .05 or above across all models, and its higher values are associated with higher levels of trust in different state authorities (models 1-3) and citizens' propensity to enter the fiscal contract (model 4) as per MH2. Among the trust in authorities variables, z*Cadaster* has the largest effect on perceived impartiality of the tax authority and trust in the legal system. Models 1-3 fit the data well, explaining 64 to 71 per cent of the variance in the variables. Admittedly, R^2 in model 4 is rather low (.38), suggesting potentially omitted variables, as for instance ideological preferences. We conclude that the data provides strong support to hypothesis MH2.

Overall, the proposition that early European tax history has not lost its relevance for contemporary tax outcomes finds support in the data. On average, European countries where rulers reformed their tax systems earlier and more comprehensively, as measured by the timing, coverage and quality of historical cadasters, have higher tax revenues, greater state capacity and higher trust in authorities today. The behavior of our main explanatory variable is robust to the inclusion to a number of demanding control variables, including democracy and the levels of economic development. We are also reasonably confident that our analysis is not biased by the problem of reverse causality since the data in the *Cadaster* variable is separated from the outcomes variable by centuries.

Conclusion

In this paper we have explored the nature of early modern tax reforms and suggested why and in what ways they might impact on contemporary tax states. We argue that the extent and depth of these reforms had consequences for the capacity of the state, distribution of the tax burden, and the relationship between the state, elites and ordinary people. Thus, depending on the extent of reforms, states were set on trajectories that either led to the emergence of a stronger and more trustworthy state, or they were not.

To test our theoretical propositions we constructed a novel indicator that captures the extent and depth of early modern tax reforms. Our hypotheses find support in the data. On average, those European countries that experienced more comprehensive tax reform in the early modern period have higher tax revenues. The data also provides support to our hypotheses stipulating the mechanisms through which this may have happened: extensive tax reforms in the early modern period are associated with higher state capacity and trust in authorities, measured in a number of ways. These associations are robust to the inclusion of a variety of demanding control variables.

There are a number of aspects of our theory and data that require further development. In common with many accounts that work within the theoretical framework of path dependency, in this paper we assume cumulative, self-reinforcing pathways that keep institutions on particular trajectories. However, there is certainly some degree of fluctuation in tax systems, state capacity and revenue levels over time even if the broad trajectory remains. For example, much as Sweden was a formidable tax state in the early modern period, it was relatively late in adopting more modern taxes like income tax. The main avenue for future research is to examine exactly how institutional persistence and institutional change occurred in European tax systems. While case-studies are certainly an obvious choice for such explorations (Balla and Johnson 2009; Johnson and Koyama 2014; Pamuk 2014), we believe that the ongoing time-series expansion of the data on state-administered cadasters will enable us to address these issues in a more comparative, yet fine-grained and dynamic fashion.
Although great care was taken in constructing the *Cadaster* measure, and the empirical tests presented here provide a great deal of confidence in its validity and strength as an indicator of the state of the tax state in early modern Europe, there is still room for measurement error, as suggested by outliers, such as Armenia, whose modest record of tax revenues does not square well with its score on *Cadaster* (graph 1). While land was a critical asset during the period under consideration, equivalent measures in other areas of tax reform related to other assets may be needed to develop an all-encompassing indicator. This will also help to address the zero values for *Cadaster* for such countries as the UK and Ireland.

The recent fiscal crises in some European states have again highlighted that these states vary considerably in their tax systems and tax capacities. Thus there is a very contemporary reason for asking questions about early modern tax states. If the reasons behind this variation are deeply rooted in long-run historical processes, we need to be aware of this to know what kind of reform may, or may not, be possible.

REFERENCES

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *The American Economic Review* 91(5): 1369-1401.

Alimento, Antonella. 2002. "Eighteenth-Century Cadastres, between Tradition and Modernity." *Revista CT/Catastro* N°46 http://www.catastro.meh.es/documentos/publicaciones/ct/ct46/09.2%20Antonella%20Alimento.pdf

Allers, Maarten, De Haan, Jakob and Cees Sterks. 2001. "Partisan Influence on the Local Tax Burden in the Netherlands." *Public Choice* 106 (3-4): 351-363.

Allingham, Michael G. and Angar Sandmo. 1972. "Income Tax Evasion: A Theoretical Analysis." *Journal of Public Economics* (1): 323-338.

Alm, James and Benno Torgler. 2006. "Culture Differences and Tax Morale in the United States and in Europe." *Journal of Economic Psychology* 27(2): 224-246.

Alm, James, Sanchez, Isabel, and Ana De Juan. 1995. "Economic and Noneconomic Factors in Tax Compliance." *Kyklos* 48 (1): 1-18.

Ames, Edward and Richard T. Rapp. 1977. "The Birth and Death of Taxes: A Hypothesis." *The Journal of Economic History* 37(1): 161-178.

Anderson, Perry. 1974. *Lineages of the Absolutist State*. London: NLB.

Balla, Eliana and Noel D. Johnson. 2009. "Fiscal Crisis and Institutional Change in the Ottoman Empire and France." *The Journal of Economic History* 69(3): 809-845.

Bäck, Hanna and Alexis Hadenius. 2008. "Democracy and State Capacity: Exploring a J- shaped relationship." *Governance* 21(1): 1-24.

Becker, Sasha O., Boeckh, Katrin, Hainz, Christa and Ludger Woessmann. 2015. "The Empire is Dead, Long Live the Empire! Long-run Persistence of Trust and Corruption in the Bureaucracy." *The Economic Journal* 126: 40-74.

Behrens, Betty. 1963. "Nobels, Privileges and Taxes in France at the End of the Ancient Regime." *The Economic History Review* 15(3): 451-475.

Besley, Timothy and Torsten Persson. 2014. "Why Do Developing Countries Tax so Little?" *Journal of Economic Perspectives* 28(4): 99-120.

Black, Jeremy. 2008. "Government, State, and Cartography: Mapping, Power and Politics in Europe, 1650-1800." *Cartographica* 43 (2): 95-105.

Bockstette, Valerie, Chanda Areendam and Louis Putterman. 2002. "States and Markets: The Advantage of an Early Start." *Journal of Economic Growth* 7: 347-369.

Boix, Carles. 2003. *Democracy and Redistribution*. New York: Cambridge University Press.

Bordignon, Massimo. 1993. "A Fairness Approach to Income Tax Evasion." *Journal of Public Economics* 52(3): 345-62.

Brewer, John. 1989. *Sinews of Power; War, Money and the English State 1688-1783*. London: Unwin Hyman.

Castro, Massimo Finocchiaro and Ilde Rizzo. 2014. "Tax Compliance Under Horizontal and Vertical Equity Conditions: An Experimental Approach." *International Tax and Public Finance* 21(4): 560-577.

Camarero Bullón, C. 2007. Les trois cadastres de l'Espagne du XVIII[e] siècle. In Touzery, M. (ed), *De l'estime au cadastre en Europe: L'époque moderne*. Paris: Ministère de l'Économie, des Finances et de l'Emploi et Ministère du Budget, des Comptes Publics et de la Function Public.

Capra, Carlo 2002. "The State of Milan's "New Census." *Revista CT/Catastro* 46. http://www.catastro.meh.es/documentos/publicaciones/ct/ct46/09.4%20Carlo%20Capra.pdf

Chapman, Sara E. 2004. *Private Ambition and Political Alliances: The Phélypeaux de Pontchartrain Family and Louis XIV's Government, 1650-1715*. Rochester, NY: University of Rochester Press.

Charron, Nicholas, Dijkstra, Lewis and Victor Lapuente. 2014. "Regional Governance Matters: Quality of Government within European Union Member States." *Regional Studies* 48: 68-90.

Cheibub, Jose A. 1998. "Political Regimes and the Extractive Capacities of Governments Taxation in Democracies and Dictatorships." *World Politics* 50: 349-76.

Cobham, Alex. 2015. "A Tax Target for post-2015". Blog-post http://uncounted.org/2015/02/27/tax-target-post-2015/

Coşgel, Metin M. and Thomas J. Miceli 2009. "Tax Collection in History." *Public Finance Review* 37(4): 399-420.

Crepaz, Markus. 1992. "Corporatism in Decline? An Empirical Analysis of the Impact of Corporatism on Macroeconomic Performance and Industrial Disputes in 18 Industrialized Democracies." *Comparative Political Studies* 25: 139-168.

Cummings, Ronald G., Jorge Martinez-Vazquez, Michael McKee and Benno Torgler. 2009. "Tax Morale Affects Tax Compliance: Evidence from Surveys and an Artefactual field Experiment." *Journal of Economic Behaviour and Organization* 70(3): 447-457.

Cusak, Thomas R. and Pablo Beramendi. 2006. "Taxing Work." *European Journal of Political Research* 45 (1): 43-73.

D'Arcy, Michelle. 2011. Why Do Citizens Assent to Pay Tax? Legitimacy, Taxation and the African State. *Afrobarometer Working Papers No 126*. http://afrobarometer.org/sites/default/files/publications/Working%20paper/AfropaperNo126.pdf

D'Arcy, Michelle and Marina Nistotskaya. 2015. "State First, The Democracy: Using Cadastral Records to Explain Governmental Performance in Public Goods Production."

The Quality of Government Institute Working Paper No 11. http://qog.pol.gu.se/digitalAssets/1537/1537779_2015_11_darcy_nistotskaya.pdf

Daunton, Martin J. 2001. *Trusting Leviathan: The Politics of British Taxation, 1799-1914*. Cambridge: Cambridge University Press.

Dincecco, Mark. 2009. "Fiscal Centralization, Limited Government, and Public Revenues in Europe, 1650–1913." *The Journal of Economic History* 69(1): 48-103.

Downing, Brain. 1992. *The Military Revolution and Political Change: Origins of Democracy and Autocracy in Early Modern Europe*. Princeton: Princeton University Press.

Ertman, Thomas. 1997. *Birth of the Leviathan: Building States and Regimes in Medieval and Early Modern Europe*. New York: Cambridge University Press.

Fleet, Kate. 2003. "Tax Farming in the Early Ottoman State." *The Medieval History Journal* 6(2): 249-258.

Flora, Peter and Arnold J. Heidenheimer (eds.). 1981. *The Development of Welfare States in Europe and America*. New Brunswick: Transaction Books.

Fortin, Bernard, Lacroix, Guy, and Marie-Claire Villeval. 2007. "Tax Evasion and Social Interaction." *Journal of Public Economics* 91(11-12): 2089-2112.

Frohnert, Pär. 2001. "Kronan, Individen och Lokalsamhället. Förvaltningen som forum för konflicthantering i Sverige 1600-1800." In Börje Harnesk and Marja Taussi Sjöberg (eds.) *Mellan Marken och Menigheten. Ämbetsmän i det Tidigmoderna Sverige*. Stockholm: Stockholm University. P. 143-175.

Gambetta, Diego. 1987. *Were They Pushed or Did They Jump? Individual Decision Mechanisms in Education*. Cambridge: Cambridge University Press.

Gerring, John, Thacker, Strom C., and Carola Moreno. 2005. "Centripetal Democratic Governance: A Theory and Global Inquiry." *American Political Science Review* 99: 567-581.

Greif, Avner. "Historical and Comparative Institutional Analysis." *The American Economic Review* 88.2 (1998): 80-84.

Hall, Peter A. and David Soskice (eds.). 2001. *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press.

Hallerberg, Mark and Scott Basinger. 1998. "Internationalization and Changes in Tax Policy in OECD Countries: The Importance of Domestic Veto Players." *Comparative Political Studies* 31: 321-352.

Hallenberg, Mats. 2012. "For the Wealth of the Realm: the Transformation of the Public Sphere in Swedish Politics, c. 1434-1650." *Scandinavian Journal of History* 35(5): 557-577.

Hallenberg, Mats, Holm, Johan, and Dan Johansson. 2008. "Organization, Legitimation, Participation: State Formation as a Dynamic Process – the Swedish example, c. 1523-1680." *Scandinavian Journal of History* 33(3): 247-268.

Hausmann, Ricardo, César A. Hidalgo, Sebastián Bustos, Michele Coscia, Alexander Simoes and Muhammed A. Yildirim. 2008. *The Atlas of Economic Complexity: Mapping Paths to Prosperity*. The Observatory of Economic Complexity (Harvard HKS/CDI - MIT Media Lab). http://www.chidalgo.com/Atlas/HarvardMIT_AtlasOfEconomicComplexity_Part_I.pdf

Herbst, Jeffrey. 2000. *States and Power in Africa*. Princeton: Princeton University Press.

Higham, Nicholas J. "The Domesday Survey: Context and Purposes." *History* 78(252): 7-21.

Hintze, Otto. 1975. *The Historical Essays of Otto Hintze*, ed. Felix Gilbert. New York: Oxford University Press.

Jonson, Noel D. and Mark Koyama. 2014. "Tax Farming and the Origings of State Capacity in England and France." *Explorations in Economic History* 51:1-20.

Kain, Roger J. P. and Elizabeth Baigent. 1992. *The Cadastral Map in the Service of the State: A History of Property Mapping*. Chicago: University of Chicago Press.

Kain, Roger. J. P. 2007. Maps and Rural Land Management in Early Modern Europe. In Woodward, D. (ed), *The History of Cartography, Vol. 3 "Cartography in the European Renaissance*. Chicago: Chicago University Press.

Karaman, Kivanc. 2009. "Decentralized Coercion and Self-restraint in Provincial Taxation The Ottoman Empire, 15th-16th century." *Journal of Economic Behaviour and Organization*. 71(3): 690-703.

Karaman, Kivanc and Sevket Pamuk. 2013. "Different Paths to the Modern State in Europe: The Interaction Between Warfare, Economic Structure, and Political Regime." *American Political Science Review* 107(3): 603-626.

Kasaba, Resat. 1988. *The Ottoman Empire and the World Economy: The Nineteenth Century*. Albany: State University of New York.

Kirchler, Erich, Erik Hoelzl, and Ingrid Wahl. 2008. "Enforced Versus Voluntary Tax Compliance: The 'Slippery Slope' Framework," *Journal of Economic Psychology* 29: 210–25.

Kiser, Edgar and Yong Cai. 2003. "War and Bureaucratization in Qin China: Exploring an Anomalous Case" *American Sociological Review* 68(4): 511-539.

Kiser, Edgar and Joshua Kane. 2001. "Revolution and State Structure: The Bureaucratization of Tax Administration in Early Modern England and France." *American Journal of Sociology* 107(1): 183-223.

Kiser, Edgar and April Linton. 2001. "Determinants of the Growth of the State: War and Taxation in Early Modern France and England." *Social Forces* 80: 411–448.

Knutsen, Cark Henrik. 2013. "Democracy, State Capacity, and Development." *World Development* 43: 1-18.

Lago-Peñas, Ignacio and Santiago Lago-Peñas. 2010. "The Determinants of Tax Morale in Comparative Perspective: Evidence from European Countries." *European Journal of Political Economy* 26(4): 441-453.

Lazaretou, Sophia. 2014. 'Greece: from 1833 to 1949'. In S*outh-Eastern European Monetary and Economic Statistics from the Nineteenth Century to World War II*, Bank of Greece, Bulgarian National Bank, National Bank of Romania, Oesterreichische Nationalbank, Athens, Sofia, Bucharest, Vienna .

Levi, Margaret. 1988. *Of Rule and Revenue*. Berkeley: University of California Press.

Levi, Margaret, Sacks, Audrey and Tom Tyler. 2009. "Conceptualizing Legitimacy, Measuring Legitimating Beliefs." *American Behavioral Scientist* 53(3): 354-375.

Lieberman, Evan. S. 2002. "Taxation Data as Indicators of State-Society Relations: Possibilities and Pitfalls in Cross-national Research." *Studies in Comparative International Development* 36 (4): 89-115.

Lindkvist, Thomas. 1987. Fiscal Systems, the Peasantry and the State in Medieval and Early Modern Sweden. In Genêt, J.-Ph. & Le Mené, M. (eds), *Genése de L'état Moderne: prélèvement et redistribution : actes du colloque de Fontevraud, 1984*. Paris: Editions du Centre national de la recherche scientifique.

Markatos, Akis. 2014. "Completing the Greek Cadaster." GIM International Interviews. http://www.gim-international.com/content/article/completing-the-greek-cadastre

Michalopoulos, Stelios and Elias Papaioannou. 2013. "Pre-Colonial Institutions and Contemporary African Development." *Econometrica* 81(1): 113-152.

Moser, Donald, John Evans, III and Chung Kim. 1995. "The Effects of Horizontal and Exchange Inequity on Tax Reporting Decisions." *The Accounting Review* 70(4): 619-634.

Nistotskaya, Marina, Charron, Nicholas and Victor Lapuente. 2015. "The Wealth of Regions: Quality of Government and SMEs in 172 European Regions." *Environment and Planning C: Government and Policy*. doi: http://epc.sagepub.com/content/early/2015/09/04/c13224r.abstract

Palaiologos. Yannis. 2014. *The 13th Labour of Hercules: Inside the Greek Crisis*. London: Portobello Books.

Pamuk, Sevket. 2014. "Fiscal Centralisation and the Rise of the Modern State in the Ottoman Empire." *The Medieval History Journal* 17(1): 1-26.

Pierson, Paul. 2000. "Increasing Returns, Path Dependence, and the Study of Politics." *American Political Science Review* 94 (1): 251–66.

Prichard, Wilson, Cobham, Alex and Andrew Goodall. 2014. "The ICTD Government Revenue Dataset." *International Center for Tax and Development Working Paper 19*. Institute for Development Studies, Brighton. http://r4d.dfid.gov.uk/pdf/outputs/taxation/ICTD-WP19.pdf

Putnam, Robert D., Leonardi, Robert and Raffaells Y. Nanetti. 1994. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.

Ross, Michael L. 2004. "Does Taxation Lead to Representation?" *British Journal of Political Science* 34 (2): 229-249.

Rothstein, Bo. 2005. *Social Traps and the Problem of Trust*. New York: Cambridge University Press.

Rothstein, Bo and Jan Teorell. 2008. "What is Quality of Government? A Theory of Impartial Government Institutions." *Governance* 21(2): 165-90.

Schremmer, D.E. 1989. "Taxation and Public Finance: Britain, France and Germany." In Peter Mathias and Sidney Pollard (eds) *The Cambridge Economic History of Europe from the Ddecline of the Roman Empire Volume 8: The Industrial Economies: The Development of Economic and Social Policies.* Cambridge: Cambridge University Press. Pp. 315-494.

Scholz, John T. "Contractual Compliance and the Federal Income Tax System." *Washington University Journal of Law and Policy* 13:139-203.

Scholz, John T. and Mark Lubell. 1998. "Adaptive Political Attitudes: Duty, Trust, and Fear as Monitors of Tax Policy." *American Journal of Political Science* 42(3): 903-920.

Schön, Lennart. 2010. "The Rise of the Fiscal State in Sweden, 1800-1914." In José Luis Cardoso and Pedro Lains (eds.) *Paying for the Liberal State: The Rise of Public Finance in Nineteenth-Century Europe*. Cambridge: Cambridge University Press. Pp. 162-185.

Scott, James. C. 1998. *Seeing Like A State: How Certain Schemes to Improve the Human Condition have Failed.* New Haven: Yale University Press.

Slemrod, Joel. 1992. *Why people Pay Taxes: Tax Compliance and Enforcement*. Michigan: University of Michigan Press.

Steinmo, Sven. 1993. *Taxation and Democracy*. New Haven and London: Yale University Press.

Steinmo, Sven and Caroline J. Tolbert. 1998. "Do Institutions Really Matter? Taxation in Industrialized Democracies." *Comparative Political Studies* 31(2): 165-187.

Tabellini, Guido. 2010. "Culture and Institutions: Economic Development in the Regions of Europe." *Journal of the European Economic Association* 8(4): 677–716.

Tilly, Charles. 1990. *Coercion, Capital, and European States, AD 990-1992*. Cambridge, MA: Blackwell.

Torgler, Benno. 2007. *Tax Compliance and Tax Morale: a Theoretical and Empirical Analysis*. Cheltenham: Edward Elgar Publishing.

Touzery, Mireille. 2007. Cadastres en Europe à l'Époque Moderne. Modèles Continentaux et Absence Anglaise. In Mireille Touzery (ed), *De l'estime au cadastre en Europe: L'époque moderne*. Paris: Ministère de l'Économie, des Finances et de l'Emploi et Ministère du Budget, des Comptes Publics et de la Function Public.

Tyler, Tom R. 1990. *Why People Obey the Law*. New Haven, CT: Yale Univ. Press.

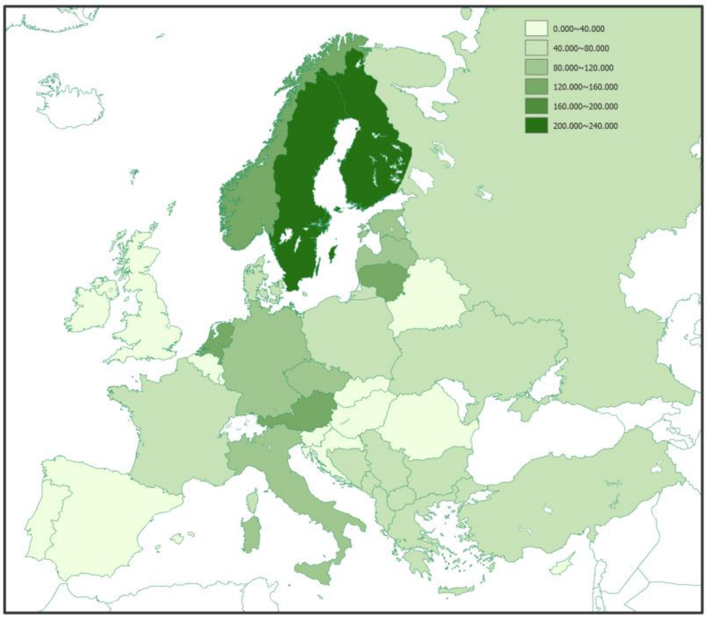
Wahl, Ingrid, Kastlunger Barbara, and Erich Kirchler. 2010. "Trust in Authorities and Power to Enforce Tax Compliance: An Empirical Analysis of the "Slippery Slope Framework." *Law and Policy* 32(4): 383–406.

Wiesner-Hanks, Merry E. 2006. *Early Modern Europe, 1450-1789.* Cambridge: Cambridge University Press.

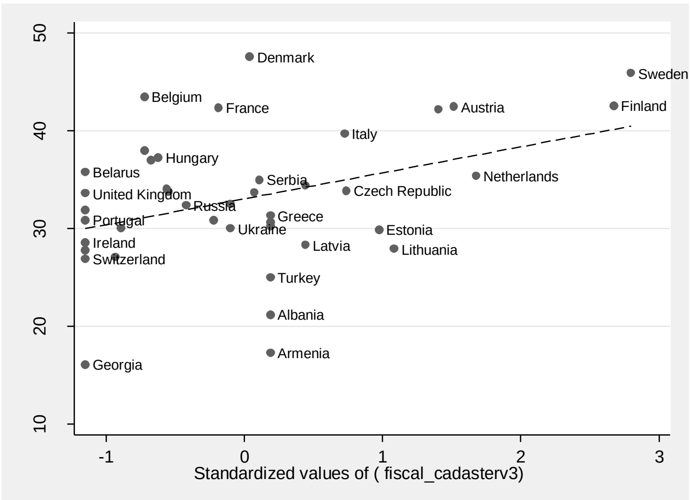
White, Eugene N. 1995. "The French Revolution and the Politics of Government Finance, 1770–1815." *Journal of Economic History* 55(2): 227–55.

Wilensky, Harold. 2002. *Rich Democracies: Political Economy, Public Policy, and Performance*. Berkeley: University of California Press.

FIGURE 1, CADASTER IN 42 EUROPEAN COUNTRIES, 1450-1800. SOURCE: AUTHORS' ORIGINAL DATA



GRAPH 1, CADASTER AND TOTAL TAX REVENUE (2001-2005, AVERAGED, ICTD).



Note: Total Tax Revenue as % of GDP, 2001-2005, averaged, ICTD; Cadaster – authors' original data.

TABLE 1, *CADASTER* AND CONTEMPORARY TAX PERFORMANCE

VARIABLES	(1)	(2)	(3)
zCadaster	1.82**	2.12**	3.11***
	(0.83)	(0.87)	(1.08)
EconDevelop	4.52**	5.79***	3.19
	(1.87)	(1.95)	(2.41)
GROWTH	-0.69	-0.04	-0.87
	(0.49)	(0.50)	(0.63)
DEMY	0.01	0.06**	0.03
	(0.03)	(0.03)	(0.03)
UNITAR	1.42	0.51	0.24
	(1.53)	(1.56)	(1.98)
Constant	29.04***	10.90**	38.22***
	(4.43)	(4.55)	(5.73)
Observations	36	35	36
R-squared	0.54	0.67	0.52

*Note: dependent variables: Total Tax Revenue as % of GDP, ICTD, 2001-2005, averaged; Direct Taxes as % of GDP, ICTD, 2001-2005, averaged; Government Revenue as % of GDP, IMF, 2001-2005, averaged. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

TABLE 2, *CADASTER* AND CURRENT STATE CAPACITY

VARIABLES	(1)	(2)	(3)
zCadaster	0.03*	0.23**	-0.20**
	(0.01)	(0.11)	(0.08)
EconDevelop	0.14***	0.29	-0.56***
	(0.04)	(0.27)	(0.19)
GROWTH	-0.02**	-0.10	0.01
	(0.01)	(0.07)	(0.04)
DEMY	0.00**	0.00	-0.00
	(0.00)	(0.00)	(0.00)
UNITAR	0.09***	-0.02	-0.12
	(0.03)	(0.19)	(0.15)
Constant	0.43***	4.99***	3.92***
	(0.09)	(0.68)	(0.41)
Observations	33	29	31
R-squared	0.83	0.49	0.64

*Note: dependent variables: ICRG_qog, 2001-2005, averaged; citizens' perception of efficiency of tax authorities, ESS, 2008; experts' perception of corruption in tax authorities, TI, 2007. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

TABLE 3, *CADASTER* AND TRUST IN AUTHORITIES

VARIABLES	(1)	(2)	(3)	(4)
zCadaster	0.49***	0.49***	0.34**	0.19**
	(0.13)	(0.17)	(0.14)	(0.08)
EconDevelop	0.56	0.23	0.28	-0.04
	(0.35)	(0.40)	(0.33)	(0.21)
GROWTH	-0.11	-0.15	-0.27***	-0.01
	(0.09)	(0.11)	(0.09)	(0.06)
DEMY	0.01	0.01***	0.01**	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)
UNITART	0.38	0.13	0.41	-0.03
	(0.25)	(0.30)	(0.25)	(0.15)
Constant	3.63***	4.00***	5.20***	4.87***
	(0.86)	(0.99)	(0.82)	(0.53)
Observations	29	31	31	29
R-squared	0.66	0.64	0.71	0.38

*Note: dependent variables: Citizens' perception of impartiality of tax authorities, 2008, ESS; Trust in the legal system, 2004-2014, ESS; trust in police, ESS, 2004-2014; Citizens' willingness to enter tax contract, ESS, 2008. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Appendix A: List of countries in the sample

Albania
Armenia
Austria
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Ireland
Italy
Kosovo
Latvia
Lithuania
Luxembourg
Macedonia, FYR
Moldova
Montenegro
Netherlands
Norway
Poland
Portugal
Romania
Russian Federation
Serbia
Slovak Republic
Slovenia
Spain
Sweden
Switzerland

Turkey
Ukraine
United Kingdom

Appendix B: Variables - Description and Sources

DV: TAX PERFORMANCE

TotalTax: total tax revenue, including social contributions, % of GDP, 2001-2005, averaged (Armenia 2000, 2001, 2003-2005; Macedonia 2000, 2001, 2002, 2006-2007). Source: the ICTD Government Revenue Dataset (Prichard, Cobham, and Goodall, 2014).

DirectTax: direct taxes including social contributions, excluding resource revenue, general government , % of GDP, 2001-2005, averaged (Armenia 2001, 2003-2005; Macedonia 2001-2002). Source: the ICTD Government Revenue Dataset (Prichard, Cobham, and Goodall, 2014)

IMF_Rev: General government revenue, including taxes, social contributions, grants receivable and other revenue, % of GDP. 2001-2005 averaged. Croatia and Turkey 2002-2005 averaged. Source: IMF, The QoG standard dataset, version Jan 2015 (imf_rev).

DV: STATE CAPACITY

ICRG_qog: the mean value of the ICRG variables "Corruption", "Law and Order" and "Bureaucracy Quality", scaled 0-1. Higher values indicate higher quality of government. The score for Serbia and Montenegro are from the united "Serbia and Montenegro" entity. 2001-2005, averaged. Source: International Country Risk Guide (ICRG), The QoG standard dataset, version Jan 2015 (icrg_qog).

Tax_corruptibility: To what extent do you perceive the following categories in this country to be affected by corruption? Tax revenue. 1 (Not at all corrupt) - 5 (Extremely corrupt). 2004 (for most of the cases), 2007 for the rest. Source: Transparency International, The QoG standard dataset, version Jan 2015 (gcb_ptax).

Tax_efficiency: How efficient do you think the tax authorities are at things like handling queries on time, avoiding mistakes and preventing fraud? 0 (extremely inefficient in doing their job) - 10 (extremely efficient). All scores are adjusted by Design and Population size weights. Source: European Social Survey, 2008, Question D31.

DV: TRUST in AUTHORITIES

Impartiality: Do the tax authorities in [country] give special advantages to certain people or deal with everyone equally? 0 – (Give special advantage to certain people) – 10 (Deal with everyone equally). All scores are adjusted by Design and Population size weights. Source: European Social Survey, Round 4 Data, 2008, Question D33.

Trust in the legal system: On a score of 0-10 how much you personally trust each of the institutions I read out. 0 mean s you do not trust an institution at all, and 10 means you have complete trust. All scores are adjusted by Design and Population size weights. Source: European Social Survey, 2004-2014, Round 7 (2014): Austria, Belgium, Czech R, Denmark, Estonia, Finland, France, Germany, Ireland, Netherlands, Norway, Poland, Slovenia, Sweden and Switzerland. Round 6 (2012): Albania, Bulgaria, Cyprus, Hungary, Italy, Kosovo, Lithuania, Russia, Slovakia, Spain, Ukraine, UK, and Portugal. Round 5 (2010): Croatia, Greece. Round 4 (2008): Turkey, Romania, and Latvia. Round 2 (2004): Luxembourg, Question B3.

Trust in police: On a score of 0-10 how much you personally trust each of the institutions I read out. 0 mean s you do not trust an institution at all, and 10 means you have complete trust. All scores are adjusted by Design and Population size weights. Source: European Social Survey, 2004-2014 (countries per round as above), Question B4.

Willingness to enter fiscal contract: Many social benefits and services are paid for by taxes. If the government had to choose between increasing taxes and spending more on social benefits and services, or decreasing taxes and spending less on social benefits and services, which should they do? 0 (Decrease taxes and social spending a lot) – 10 (Increase taxes and social spending a lot). All scores are adjusted by Design and Population size weights. Source: European Social Survey, Round 4, 2008, Question D34.

IV and CONTROLS:

z*Cadaster*: Extend and quality of state-administered fiscal cadasters, 1450-1800, normalized. Source: Constructed by the authors.

UNITARISM: 0= federal (elective regional legislatures plus conditional recognition of subnational authority), 1=semifederal (where there are elective legislatures at the regional level but in which constitutional sovereignty is reserved to the national government) or 2 = unitary. 1990-2000 average. (Armenia 1992-1995, 1998-2000; Belarus 1992-1995; Bosnia and Herzegovina 1992-1994, 1996-2000). Source: Gerring et al 2005, The QoG standard dataset, version Jan 2015 (gtm_unit) and constructed by the authors for countries that are not covered by the Gerring et al's sample.

Economic Development: Economic Complexity Index, a measure of complexity and diversification of products in an economy, an alternative measure of economic development. 1996-2000, averaged. Source: Hausmann et al 2008.

GROWTH: annual percentage rate of GDP at market prices based on constant local currency, 2001-2004, averaged. Source: World Bank Development Indicators, The QoG standard dataset, version Jan 2015 (wdi_gdpgr).

DEMY: the number of years under democratic rule (Polity 6 or more) since the inception of democracy until 2000.

ROBUSTNESS CHECKS:

zCadaster_5%: extent and quality of state-administered cadasters, discounted by 5% for every 50 years between 1800 and 1450, normalized. Source: Constructed by the authors

Language fraction: reflects probability that two randomly selected people from a given country will not belong to the same linguistic group. The higher the number, the more fractionalized society. Years: 2001-2005, averaged. Source: The QoG standard dataset, version Jan 2015 (al_language)

GINI index: a measurement of the income distribution of a country's residents, ranging from 0 (perfect equality) to 1 (perfect inequality) Year: 2002. Source: the World Bank, World Development Indicators, http://data.worldbank.org/data-catalog/world-development-indicators

Appendix C: Summary Statistics

Variable	N	mean	sd	min	max
Response variables: contemporary tax outcomes					
Cadaster	42	64.48	55.94	0	221
z*Cadaster*	42	3.55e-10	1	-1.15	2.8
Total Tax Revenue, ICTD	41	33.06	6.94	16.1	47.6
Government Revenue, IMF	39	39.2	9.15	16.47	56.15
Direct Tax Revenue, ICTD	40	19.24	8.19	2.66	35.43
Response variables: contemporary state capacity					
ICRG_qog	38	.68	.20	.34	1
Tax authorities efficiency	30	5.07	.77	3.01	6.76
Tax authorities corruptibility	33	3.07	.68	1.72	4.22
Response Variables: trust in government					
Tax authorities impartiality	30	4.88	1.18	2.68	7.03
Trust in the legal system	34	4.69	1.42	1.89	7.4
Trust in police	34	5.64	1.28	2	7.9
Willingness to enter fiscal contract	30	5.04	.54	3.54	5.98
Control variables					
Years under democratic rule	42	40.19	44.05	0	152
Economic Complexity Index	36	1.01	.67	-.35	2.21
Annual GDP growth	39	4.07	2.62	.58	11.81
Unitarism	41	1.62	.6	0	2
Robustness checks					
z*Cadaster*_5%	42	-4.61 e-09	1	-1.25	2.8
GINI	41	.32	.04	.26	.41
Language fractionalization	32	.26	.2	.02	.64

Appendix D: Cadaster and Contemporary Tax performance

TABLE 1, *CADASTER* AND TOTAL TAX REVENUE

VARIABLES	(1)	(2)	(3)	(4)	(5)
z*Cadaster*	2.65**	2.10**	1.96**	1.97**	1.82**
	(1.01)	(0.82)	(0.81)	(0.82)	(0.83)
EconDevelopment		5.64***	4.10**	3.91**	4.52**
		(1.30)	(1.59)	(1.74)	(1.87)
GROWTH			-0.72	-0.67	-0.69
			(0.45)	(0.49)	(0.49)
DEMY				0.01	0.01
				(0.03)	(0.03)
UNITAR					1.42
					(1.53)
Constant	33.07***	27.65***	32.04***	31.72***	29.04***
	(1.01)	(1.56)	(3.12)	(3.36)	(4.43)
Observations	41	36	36	36	36
R-squared	0.15	0.49	0.52	0.53	0.54

*Note: dependent variable: Total Tax Revenue as % of GDP, 2001-2005, averaged, ICTD. Standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$*

TABLE 2. CADASTER AND TOTAL TAX REVENUE, ROBUSTNESS CHECKS

VARIABLES	(1)	(2)	(3)	(4)	(5)
z*Cadaster*	3.83***	3.32***	3.11***	3.13***	3.11***
	(1.31)	(1.07)	(1.04)	(1.04)	(1.08)
EconDevelop		6.07***	3.82*	3.09	3.19
		(1.69)	(2.05)	(2.22)	(2.41)
GROWTH			-1.06*	-0.86	-0.87
			(0.58)	(0.62)	(0.63)
DEMY				0.03	0.03
				(0.03)	(0.03)
UNITAR					0.24
					(1.98)
Constant	39.21***	33.49***	39.91***	38.68***	38.22***
	(1.34)	(2.03)	(4.03)	(4.28)	(5.73)
Observations	39	36	36	36	36
R-squared	0.19	0.46	0.51	0.52	0.52

*Note: dependent variable: Government Revenue as % of GDP, IMF, 2001-2005, averaged. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

TABLE 3, *CADASTER* AND DIRECT TAX REVENUE

VARIABLES	(1)	(2)	(3)	(4)	(5)
z*Cadaster*	3.07**	2.09**	2.04**	2.18**	2.12**
	(1.23)	(0.88)	(0.89)	(0.84)	(0.87)
EconDevelop		8.04***	7.20***	5.56***	5.79***
		(1.37)	(1.74)	(1.79)	(1.95)
GROWTH			-0.39	-0.03	-0.04
			(0.49)	(0.49)	(0.50)
DEMY				0.06**	0.06**
				(0.03)	(0.03)
UNITAR					0.51
					(1.56)
Constant	19.36***	11.67***	14.08***	11.87***	10.90**
	(1.22)	(1.65)	(3.45)	(3.39)	(4.55)
Observations	40	35	35	35	35
R-squared	0.14	0.60	0.61	0.66	0.67

*Note: dependent variable: Direct Taxes as % of GDP, 2001-2005, averaged, ITCD; Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Appendix E: Robustness Checks

TABLE 1, *CADASTER*, CONTEMPORARY TAX PERFORMANCE, STATE CAPACITY AND TRUST IN GOVERNMENT, CONTROLLING FOR INCOME INEQUALITY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES		Tax Outcomes			State Capacity			Trust in Government		
zCadaster	1.55*	1.87**	2.75**	0.03*	0.26**	-0.14	0.53***	0.50***	0.38**	0.22**
	(0.81)	(0.85)	(1.04)	(0.02)	(0.11)	(0.08)	(0.14)	(0.18)	(0.16)	(0.08)
EconDevelop	2.84	3.99*	0.97	0.18***	0.72**	-0.39**	1.12***	0.57	0.96**	0.21
	(2.00)	(2.11)	(2.58)	(0.04)	(0.31)	(0.19)	(0.39)	(0.44)	(0.40)	(0.23)
DEMY	0.04	0.07***	0.07**	0.00***	0.00	-0.00	0.01	0.02***	0.01**	0.00
	(0.02)	(0.03)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
UNITAR	1.17	0.38	-0.08	0.09***	0.02	-0.14	0.43*	0.14	0.45	-0.01
	(1.45)	(1.50)	(1.88)	(0.03)	(0.20)	(0.14)	(0.24)	(0.31)	(0.29)	(0.14)
GINI	-61.53**	-42.62	-79.71**	0.05	4.89	5.49**	7.19	2.13	5.37	4.70
	(26.32)	(27.13)	(33.96)	(0.59)	(4.13)	(2.54)	(5.10)	(6.14)	(5.59)	(3.01)
Constant	46.95***	25.95**	61.62***	0.26	2.47	2.08**	0.24	2.28	1.52	3.05**
	(9.93)	(10.28)	(12.81)	(0.23)	(1.58)	(0.93)	(1.96)	(2.33)	(2.12)	(1.16)
Observations	36	35	36	33	29	31	29	31	31	29
R-squared	0.58	0.69	0.57	0.79	0.48	0.70	0.67	0.62	0.62	0.44

*Note: dependent variables: (1) Direct Taxes as % of GDP, 2001-2005, averaged, ITCD; (2) Direct Taxes as % of GDP, ICTD, 2001-2005, averaged; (3) Government Revenue as % of GDP, IMF, 2001-2005, averaged; (4) ICRG_qog, 2001-2005, averaged; (5) Citizens' perception of efficiency of tax authorities, ESS, 2008; (6) Experts' perception of corruption in tax authorities, TI, 2007; (7) Citizens' perception of impartiality of tax authorities, 2008, ESS; (8) Trust in the legal system, 2004-2014, ESS; (9) Trust in police, ESS, 2004-2014; (10) Citizens' willingness to enter tax contract, ESS, 2008. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

TABLE 2. *CADASTER*, CONTEMPORARY TAX PERFORMANCE, STATE CAPACITY AND TRUST IN GOVERNMENT, CONTROLLING FOR LANGUAGE FRACTIONALIZATION

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES		**Tax Outcomes**			**State Capacity**			**Trust in Government**		
zCadaster	1.77**	2.61***	2.91***	0.02	0.23*	-0.18*	0.44***	0.51**	0.36**	0.20**
	(0.85)	(0.84)	(1.00)	(0.02)	(0.13)	(0.09)	(0.15)	(0.19)	(0.17)	(0.09)
EconDevelop	5.93***	4.49**	5.50**	0.19***	0.54*	-0.65***	0.97**	0.45	0.65*	0.04
	(1.88)	(1.89)	(2.21)	(0.04)	(0.30)	(0.22)	(0.36)	(0.41)	(0.37)	(0.20)
DEMY	0.02	0.06**	0.04	0.00***	0.00	-0.00	0.01**	0.02***	0.01***	0.01***
	(0.02)	(0.02)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
UNITAR	2.70	-0.68	1.49	0.09**	0.11	-0.25	0.75*	0.06	0.13	0.15
	(1.97)	(1.91)	(2.32)	(0.04)	(0.31)	(0.22)	(0.37)	(0.44)	(0.39)	(0.21)
Language fractionalization	-1.76	-2.44	-4.05	-0.01	0.22	-0.06	0.92	-1.12	-1.39	0.24
	(4.97)	(4.93)	(5.86)	(0.10)	(0.85)	(0.53)	(1.02)	(1.19)	(1.07)	(0.58)
Constant	22.44***	14.62***	30.67***	0.27**	3.92***	4.30***	1.80*	3.39***	4.37***	4.27***
	(5.12)	(5.07)	(6.04)	(0.10)	(0.85)	(0.55)	(1.02)	(1.12)	(1.01)	(0.58)
Observations	30	29	30	29	26	27	26	28	28	26
R-squared	0.58	0.72	0.61	0.80	0.45	0.63	0.67	0.62	0.60	0.50

*Note: dependent variables: (1) Direct Taxes as % of GDP, 2001-2005, averaged, ITCD; (2) Direct Taxes as % of GDP, ICTD, 2001-2005, averaged; (3) Government Revenue as % of GDP, IMF, 2001-2005, averaged; (4) ICRG_qog, 2001-2005, averaged; (5) Citizens' perception of efficiency of tax authorities, ESS, 2008; (6) Experts' perception of corruption in tax authorities, TI, 2007; (7) Citizens' perception of impartiality of tax authorities, 2008, ESS; (8) Trust in the legal system, 2004-2014, ESS; (9) Trust in police, ESS, 2004-2014; (10) Citizens' willingness to enter tax contract, ESS, 2008. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

APPENDIX F, *CADASTER*, DISCOUNTED AT 5% PER EVERY 50 YEARS BETWEEN 1800 AND 1450, CONTEMPORARY TAX PERFORMANCE, STATE CAPACITY AND TRUST IN GOVERNMENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES		**Tax Outcomes**			**State Capacity**			**Trust in Government**		
zCadaster_5%	1.88**	2.20**	3.17***	0.03**	0.24**	-0.21**	0.51***	0.49***	0.36**	0.20**
	(0.84)	(0.88)	(1.08)	(0.01)	(0.11)	(0.08)	(0.13)	(0.17)	(0.14)	(0.08)
EconDevelop	4.30**	5.53***	2.83	0.14***	0.26	-0.53**	0.51	0.18	0.24	-0.06
	(1.87)	(1.96)	(2.43)	(0.04)	(0.27)	(0.19)	(0.34)	(0.40)	(0.33)	(0.21)
GROWTH	-0.71	-0.06	-0.90	-0.02**	-0.11	0.01	-0.11	-0.15	-0.27***	-0.01
	(0.49)	(0.49)	(0.63)	(0.01)	(0.07)	(0.04)	(0.09)	(0.11)	(0.09)	(0.06)
DEMY	0.01	0.06**	0.03	0.00**	0.00	-0.00	0.01	0.01***	0.01**	0.01**
	(0.03)	(0.03)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
UNITAR	1.38	0.46	0.18	0.09***	-0.02	-0.11	0.37	0.13	0.40	-0.03
	(1.53)	(1.56)	(1.98)	(0.03)	(0.19)	(0.15)	(0.24)	(0.30)	(0.25)	(0.15)
Constant	29.34***	11.27**	38.72***	0.43***	5.02***	3.88***	3.69***	4.04***	5.24***	4.89***
	(4.43)	(4.55)	(5.73)	(0.09)	(0.68)	(0.41)	(0.85)	(0.99)	(0.81)	(0.53)
Observations	36	35	36	33	29	31	29	31	31	29
R-squared	0.54	0.67	0.53	0.83	0.50	0.65	0.68	0.64	0.71	0.38

*Note: dependent variables: (1) Direct Taxes as % of GDP, 2001-2005, averaged, ITCD; (2) Direct Taxes as % of GDP, ICTD, 2001-2005, averaged; (3) Government Revenue as % of GDP, IMF, 2001-2005, averaged; (4) ICRG_qog, 2001-2005, averaged; (5) Citizens' perception of efficiency of tax authorities, ESS, 2008; (6) Experts' perception of corruption in tax authorities, TI, 2007; (7) Citizens' perception of impartiality of tax authorities, 2008, ESS; (8) Trust in the legal system, 2004-2014, ESS; (9) Trust in police, ESS, 2004-2014; (10) Citizens' willingness to enter tax contract, ESS, 2008. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1*