

# Franchise extension and tax structure in the presence of home production: Evidence from the Kingdom of Greece

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**Abstract:** This paper examines the impact of franchise extension on tax structure in an agrarian economy where goods can be produced for own consumption. We first develop a theoretical model of optimal taxation with heterogeneous agents that considers the possibility of working at home or in the market. Individual consumption is composed of a good produced and purchased in the market -and therefore is subject to a consumption tax- and a good that is produced by work at home and is self-consumed. The good that is self-consumed is not subject to consumption tax but the level of its production is harmed by direct taxes that burden home production (such as the *land tithes*). Our theoretical framework suggests that extension of the voting franchise to the poorer segments of the population exerts a negative impact on the share of direct to indirect taxes. This is because after the reform the new political majority is mostly constituted by agents working at home and is in favor of lower direct taxes and higher indirect taxes since the latter can be avoided through self-consumption. Our central theoretical prediction is established empirically based on a unique dataset of tax revenues of the Kingdom of Greece, a typical agrarian economy characterized by a substantial level of home production when universal male suffrage was established in 1864. Our analysis suggests that Greek governments decreased direct taxes and increased indirect taxes in order to meet the preferences of the newly enfranchised electorate, who was mostly constituted by peasants and farmers. This specific group of agents was harmed by *direct taxes on land* but was able to avoid *indirect taxes* through self-consumption. Finally, our analysis employs a sample of 12 Western European countries over the same period and provides evidence for a similar change in tax policy when the agricultural sector dominates the economy.

**JEL:** P16, H2, H5; **Keywords:** democracy, tax structure, fiscal capacity

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## 1. Introduction

Conventional theory suggests that extending the voting franchise to poorer segments of the society increases the demand for redistribution and fiscal expansion (see, e.g., Meltzer and Richard, 1981). This is attributed to competing political parties that are expected to shift their policy platforms to respond to the preferences of the hitherto disenfranchised voters.<sup>1</sup> A large number of studies employing historical data investigate whether the so-called “first wave of democratisation” that took place from 1828 to 1926 (Huntington, 1993), affected the level and the pattern of government spending and taxation (see Lindert, 1994; Lindert, 2004; Aidt et al., 2006; Aidt and Jensen, 2009a; Aidt and Jensen, 2013).<sup>2</sup>

Interestingly, some of these studies highlight the importance of various intermediating factors that make the relationship between democratisation and fiscal policy much more complex (see, e.g., Aidt et al., 2010; Aidt and Jensen, 2013). One significant factor seems to be the phase of economic development and consequently the structure of the domestic economy (see e.g., Aidt and Jensen, 2009b). In particular, economic history suggests that industrialised economies were in need of increased fiscal revenues that would ensure the provision of public goods, such as health and education. This is due to the accumulation of physical capital during the process of industrialisation that raised the importance of human capital in the growth process, reflecting the complementarity between capital and skills.<sup>3</sup> Since the pure laissez-faire policy failed to develop a proper educational system, citizens demanded from the authorities the provision of this public good (see e.g., Galor, 2005). At the same time, domestic migration of the working population from the countryside to the urban centres generated severe problems of increased urban mortality and morbidity that should have been addressed by investments in health-related amenities (see e.g., Szreter, 1997; Szreter and Mooney, 1998).<sup>4</sup>

The resulted arise of public education and the subsequent increase in the literacy rate of the domestic population facilitated the improvement of the tax collection capacity of the state and the reliance on efficient direct forms of taxation (see Aidt and Jensen, 2009b).<sup>5</sup> Therefore, when franchise

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<sup>1</sup>This poses the question, though, why powerful elites dilute power by offering voting rights to the poorer segments of society. Recent research has stressed income inequality (Justman & Gradstein, 1999; Acemoglu & Robinson, 2000; Boix, 2003) and conflicting interests within the elite (Lizzeri & Persico, 2004; Llavador and Oxby, 2005) as significant factors of enfranchisement in Western Europe during the 19<sup>th</sup> century. However, irrespective of the reason that triggered the reform, scholars share the prediction that full enfranchisement should increase the size of the government. For an excellent review of alternative theories of franchise extension, see Przeworski (2009).

<sup>2</sup> A parallel strand of this literature investigates this relationship by focusing on the second and third waves of democratization, employing modern data for a large set of developed and developing countries (see Boix, 2003; Mulligan et al., 2004; Profeta et al., 2013; Acemoglu et al., 2015; Kammas and Sarantides, 2018).

<sup>3</sup> Evidence for the complementarity between technological progress (or capital) and skills is provided by Goldin and Katz (1998).

<sup>4</sup> The standards of living issue in the era of the industrial revolution has been investigated by a large number of scholars (see e.g., Hobsbawm, 1957). For instance, Szreter and Mooney (1998), focusing on the largest industrial British cities, show that life expectancy at birth was lower in 1871 than in 1821, despite rising real wages, attributing this decline to the deteriorating urban environment.

<sup>5</sup> Specifically, Aidt and Jensen (2009b) suggest that the cost of collecting income and other direct taxes relative to the cost of collecting indirect taxes fell as literacy and numerical skills of the potential taxpayers improve. Related to that, Besley and Persson (2011; 2013) show that developed countries rely to a greater extent on income taxes as opposed to indirect taxes (e.g., customs) than developing

extension takes place in the context of a developed, industrialized economy -characterized by high tax collection capacity- both total tax revenues (as a share of GDP) and the share of direct taxes, are expected to increase. However, this effect of democratisation on the size and composition of tax revenues might not necessarily be the case for developing economies, and even more so for a newly democratised agrarian economy. This is because, in such a case, the tax collection capacity of the state is definitely low, whereas public investment in human capital, which could help alleviate this problem over time, is not that urgent as in an industrialised economy.<sup>6</sup>

Moreover, in a less developed, agrarian economy a large number of the population is working in the home production sector and consumes a substantial portion of the household production. Even when the economy is not the typical *subsistence production* economy (where the production is just sufficient to meet the consumption of the producer), self-consumption is expected to be substantially high -especially in the rural areas- and the potential home production surplus is usually exchanged through barter, rather than a market system. The presence of a large home production sector is expected to affect considerably the implemented tax policy (see e.g., Kleven et al., 2000; Olovsson, 2015), and as a consequence the effect of voting franchise extension on the size and the composition of tax revenues.

The paper at hand, seeks to explore the effect of democratisation on the size and the composition of tax revenues in the Kingdom of Greece that was a typical agrarian economy when universal male suffrage was established in 1864 with approximately 76 percent of the workforce employed in agriculture. To formalise the testable empirical hypotheses in such a context, we first develop a theoretical model of optimal taxation with heterogeneous agents that builds upon Persson and Tabellini (2000) adding also the possibility these agents to work in home production. More precisely, the economy is populated by a continuum of agents that differ on their private productivity. Individual consumption is composed of a good produced and purchased in the market -and therefore is subject to a consumption tax- and a good that is produced by work at home and is in turn self-consumed.<sup>7</sup> The good that is self-consumed is not subject to the consumption tax but the level of its production is harmed by specific forms of direct taxation (such as the *land tithes*) that burden home

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countries do. A fundamental reason is that it is much harder for developing countries to collect direct taxes, which require major investments in fiscal capacity, namely in enforcement and compliance structures throughout the entire economy.

<sup>6</sup> Two reasons that can justify the lower level of public investment in human capital in a developing/agrarian economy are the following: (i) The complementarity between human capital and land is very low in the production process and definitely much lower than in the case of an industrialised economy (see Galor, 2005 for more details on this). On top of this, it should not be overlooked that landed elites do not benefit from public investment in human capital, since universal public education will increase the cost of labor beyond the increase in average labor productivity in the agricultural sector, reducing in this way the return of land (Galor et al., 2009); (ii) The priorities of a government for internal stability at this early stage of development can significantly affect the allocation of the public budget in favour of security expenditures and against health and education expenditures (see, Aidt et al., 2006).

<sup>7</sup> Following the rationale of the relevant literature we assume the economy produces a single homogeneous good in the rural (home production) sector and in the market sector (see Ashraf and Galor, 2011 for more details on this).

production. Differences on private productivity are reflected on the optimal choices of the agents concerning the allocation of their time between working in the market or at home. More precisely, higher productivity's individuals are working in the market. Consequently, agents differ on their levels of home and market consumption and therefore have different preferences concerning the implemented tax policy.

Solving the model for the median voter political equilibrium, our results are as follows. An extension of the voting rights to the poorer segments of the population -that inevitably implies lower levels of median productivity of the electorate- exerts a positive impact on consumption taxes and a negative impact on direct taxes that burden home production. As a result, franchise extension causes the share of direct to indirect taxes to decrease. This is because the new political majority after the reform is mostly constituted by agents working at home and is in favor of lower direct taxes and higher indirect taxes since the latter can be avoided through self-consumption. Moreover, our analysis suggest that this effect is conditional on the level of economic development and therefore the size of home production (and self-consumption) in the economy. In particular, the negative impact of democratization on the share of direct to indirect taxes mitigates as the level of economic development increases.

In order to investigate the empirical validity of our central theoretical prediction we develop a unique dataset of the Greek state that contains information for a large variety of tax instruments at: (i) the national level during the period 1833-1933, and (ii) the regional (i.e., provinces) level during the period 1853-1879. The empirical findings obtained from the national layer of our analysis suggest that the reform of enfranchisement in 1864 did not affect the level of *total taxes* as a share of GDP but exerted a significant impact on tax composition (see also Dertilis 1993; 2015). More precisely, universal male suffrage was accompanied by a significant decrease in the share of *rural taxes* (i.e., *land* and *assessed taxes*) and increases in specific categories of *indirect taxes* –mostly *custom duties* and *excises taxes*. Political economy motives were behind the observed shifts in the implemented tax policy.<sup>8</sup> Specifically, Greek governments decreased taxes on agriculture and livestock production in order to satisfy the large majority of the electorate -who was mostly constituted by peasants and

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<sup>8</sup> According to Dertilis (2015, pp 789-790), the major priority of the elected governments (but also of the Crown), at least during the first decades after independence in 1833, was to legitimize their authority. To this end, they mainly focused on policies that aimed to ensure a minimum level of social consensus and to convince the citizens of the young Greek state - the vast majority of which were living in rural areas - that the public demands of the war of independence, i.e., “social justice”, “democracy”, and “equality of political rights”, would be satisfied.

farmers<sup>9</sup>- and at the same time increased indirect taxes that did not harm the rural population, since the latter was able to avoid them through self-consumption.<sup>10</sup>

To reinforce further this argument, building on a dataset of 43 tax administrative units (i.e., public cashiers) from 1853 to 1879, our analysis investigates whether the negative effect after democratization on *rural taxes* was more intensive in provinces characterized by a higher share of population employed in the agriculture. This Difference-in-Difference (DD) specification directly relates to the idea of using the “dosage” of suffrage in examining its effect on political and economic outcomes (see, e.g., Berlinski and Dewan, 2011). Consistent with our expectations, obtained empirical findings suggest that there is a clear-cut negative and significant relationship between the intensity of workforce in agriculture and *rural taxes* per capita at the regional level after democratization.

Finally, in order to check the generality of our results, we test our second hypothesis that this effect on tax structure is conditional on the level of economic development (as proxied by the prevalence of the agricultural sector). To this end, we explore the effect of democratisation on the size and composition of taxation for a sample of 12 Western European countries for the period 1841-1933. Our empirical findings suggest that democratisation is negatively correlated with the share of *direct to indirect taxes* when the percent of workforce occupied in agriculture is substantially high (above 60 percent) as in the case of Greece. This effect is reversed gradually and becomes positive and significant when the agricultural sector drops below a certain threshold (~38 percent), leading also at high levels of development to an increase of *total taxes* as a share GDP. These results for Europe are compatible with previous empirical studies investigating similar issues (see e.g., Aidt and Jensen, 2009b) as well as with our theoretical priors.

The rest of the paper is organised as follows. In Section 2, we provide some stylized facts about the tax structure in the Kingdom of Greece and we develop the theoretical framework. In Sections 3 and 4 we discuss the data, our empirical strategy and the empirical results obtained from the national and regional empirical analysis in Greece. In Section 5 we present the corresponding empirical findings from the European sample. Finally, in Section 6 we conclude.

## 2. Stylized facts and the theoretical framework

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<sup>9</sup> It must be noted that during that period, Greece was a typical agrarian economy characterized by a large number of small farmers and an amazingly equal distribution of land. Therefore, decreases in land tithes did not have significant distributional implications between the landowners. See below for more details on this.

<sup>10</sup> The policy decision to increase indirect taxes was compatible with the weak administrative capabilities and the narrow tax collection capacity of the Greek state during that period. This change harmed the population living in urban regions, since local or imported basic goods (wheat, textiles, and energy producing raw materials) were burdened by indirect taxes (see Dertilis, 2015, pp.794-799; pp.806-808).

## 2.1 Stylized facts and empirical motivation

In this section, we present some first descriptive evidence for the shape of tax policy in the Kingdom of Greece before and after the democratization episode in 1864. Our national tax data contain information from the final fiscal accounts (i.e., *Apologismoi*) of the Greek state between 1833-1933. This database was developed mainly from the heroic efforts of Dertilis (1993) who tracked a significant number of historical fiscal accounts of the Greek state, and the subsequent significant contribution of Prontzas et al. (2011). George Dertilis has donated the original archival material to the Historical Archive of the National Bank of Greece (HANBG). It should be noted that in the HANBG, we obtained the fiscal statistics of the years 1853-1879 that we use in the regional analysis in Section 4.

Dertilis (1993) classification is based on the methodology of Flora et al. (1983) that divides taxes into 13 broad tax categories: (1) *land taxes*, (2) *assessed taxes*, (3) *trade taxes*, (4) *corporation taxes*, (5) *income tax*, (6) *property taxes*, (7) *inheritance taxes*, (8) *extraordinary taxes*, (9) *other direct taxes*, (10) *customs taxes*, (11) *excise taxes*, (12) *turnover taxes*, and (13) *other indirect taxes*.<sup>11</sup> All fiscal data are based on central government accounts. This is not a major shortcoming, since during that period local government finances in Greece were not significantly developed. Based on this classification, we construct two variables to measure the size and composition of taxation. First, we develop the variable *total taxes* as a share of GDP that is the sum of all tax categories (i.e., (1) to (13)). Data for GDP are taken from Kostelenos et al. (2007), who managed to compose reliable estimates of the magnitude of the Greek economy for the period of 1830-1939. Second, we develop the variable *direct/indirect* that is defined as the ratio of *direct taxes* (i.e., categories (1) to (9)) to *indirect taxes* (i.e., categories (10) to (13)).

In turn, in order to further investigate the distributional implications of taxation, we develop the following variables - all expressed as a percentage of total taxes. The first variable is defined as *rural taxes* and is comprised by the summation of *land* and *assessed taxes* (i.e., categories (1) and (2)). Obviously, this variable covers taxes that are levied on land and/or earnings from agriculture and livestock production. Second, we construct the variable *urban taxes* that includes the remaining tax categories (i.e., categories (3) to (9)). This includes taxes that are levied on earnings of small firms and profits of corporations, real estate property and inheritance taxes and, after 1911, the newly established (personal) income tax. As can be understood, *urban taxes* were mostly burden citizens that were living in more urbanised areas. Focusing on indirect taxation, we construct the variable *customs taxes* (i.e., category (10)) consisting of customs duties on the basis of the value of the imported commodities

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<sup>11</sup> All variables are expressed in Drachmas, the currency of Greece during the 19th and 20th centuries.

passing through custom houses.<sup>12</sup> Finally, we develop the variable *market taxes* that is comprised by the summation of *excise taxes*, *turnover taxes*, and *other indirect taxes* (i.e., categories (11) to (13)). In Section A1 of Appendix A, we provide additional details about the national tax dataset employed in the analysis.

Table 1 and Figure 1 record quantitative information on the tax structure in the Kingdom of Greece from 1833 to 1933. Table 1 presents the average values of the above-described variables for five selected periods, two before and three after the radical reform of enfranchisement in 1864. It is important to note that during the first period (1833-1844), the political regime was an *absolute monarchy* under the reign of King Otto that transformed to a *constitutional monarchy* (1845-1864) after the adoption of the Constitution of 1844.<sup>13</sup> Then, in 1862, King Otto was overthrown by a rising of the guard and people of Athens and a series of events led to the appointment of a new monarch (George I) and the new Constitution of 1864 that established a *crowned democracy* with universal suffrage for all males aged 21 years old and above. According to the new constitution, instead of a ballot, voters could cast a small lead ball into one of the ballot boxes allocated to each one of the candidates standing for elections (see Figure C1 in Appendix C). This is of paramount importance since it allowed illiterates to participate in the electoral process without intervention of third parties, transferring therefore real power to the people.

The first interesting stylized fact observed in Table 1 is that the level of total taxes remains relatively constant between the sub-periods (1845-1864) and (1865-1879). In other words, the reform of enfranchisement in 1864 did not lead to fiscal expansion as suggested by the relevant theoretical literature (see e.g., Meltzer and Richard, 1981) and previous historical empirical studies (see e.g., Aidt and Jensen, 2009b). The second interesting finding is that between the same sub-periods, *rural taxes* present a stark decrease from 56.7 to 38.5 percent of total taxes, whereas indirect taxes (summation of *custom* and *market taxes*) increased from 40.9 to 56.5.<sup>14</sup> This stylized fact becomes also clear in Figure 1 where for years before 1864 the evolution of *total taxes* follows closely the evolution of *rural taxes* -that obviously constituted the main source of tax revenues during that period- whereas from 1864 to 1920 *total taxes* commove with *indirect taxes*.

[Insert Table 1 and Figure 1 here]

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<sup>12</sup> For exported commodities that the vast majority is agricultural goods, the duties form part of rural taxation. See Section A3 in Appendix A for more details on this.

<sup>13</sup> In Section 3.1 we provide a more detailed description of the historical events that led to the gradual transformation of the political regime from *absolute monarchy* (1833-1844) to *constitutional monarchy* (1845-1864) and then (from 1865) to a *crowned democracy*.

<sup>14</sup> The years just before democratisation (1861-1863) decreases of *rural taxes* depicted in Figure 1 are mainly attributed to incidents of political instability after the expulsion of King Otto from Greece, which precluded the collection or submission of locally collected taxes to the Greek state (see Petrakis, 1985).

This co-movement of *total taxes* with *indirect taxes* seems to disrupt around 1920 due to the sharp increase of *urban taxes* that takes place from 1920 to 1933. Although *urban taxes* remained relatively constant to a low level from 1864 to 1915 (around 6.7 percent of total taxes on average), after 1920 they increased substantially and remained at much higher levels (18.7 on average) - becoming in this way one additional basic source of tax revenues for the Kingdom of Greece.

However, it should be noted that in the case of Greece increased tax revenues from *urban taxes* during that period were not driven by higher reliance on regular forms of direct taxes like the (personal) income tax, rather than by increases on specific types of direct taxation (such as the *extraordinary tax* and *other direct taxes*).<sup>15</sup> After 1920 the sharp increase in *total taxes* was the result of fiscal innovations -that were aiming to increase tax revenues- undertaken by the Kingdom of Greece during the previous years (i.e., before the Balkan Wars and WWI) mostly in order to encounter a series of military challenges. This stylized fact is in line with the theoretical predictions of scholars who suggest that military competition promoted investments in fiscal capacity that enabled states to raise tax revenues (see e.g., Hintze, 1906; Tilly 1975, 1985; Dincecco and Prado, 2012). In Appendix A2 we provide a brief history of the evolution of the Greek tax system during the period 1833-1933, whereas in Appendix A3 we describe -in a more detailed way- the fiscal practices followed by the Kingdom of Greece to collect rural taxes from 1853 to 1879.

## 2.2 Theoretical framework: Tax structure in the presence of home production

Motivated by the stylized facts described above, this section elaborates on the theoretical link between democratization and the composition of taxes in the presence of home production. More precisely, we develop a theoretical model of optimal taxation with heterogeneous agents that builds upon Persson and Tabellini (2000) but takes also into account the possibility of the agents to work in home production (as in Gronau, 1977; 1986). Thus, individual consumption is composed of a good produced and purchased in the market and is subject to a consumption tax and a good that is produced by work at home and in turn is self-consumed. Home produced good is not subject to any indirect tax but the level of its consumption is harmed by taxes that burden home production (such as the *land tithes*). Private agents differ on their productivity and they conclude to different levels of labor supply in the market, work at home and leisure. More precisely, the higher the productivity of the individuals the more likely is to work in the market. As a consequence, agents differ on the levels of home and market consumption and consequently have different preferences concerning the implemented tax policy. We

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<sup>15</sup> We note that although in 1911, Eleftherios Venizelos introduced the first modern personal income tax, the tax revenues from personal income taxation were insignificant until 1918 and exceeded 5 percent as a share of total taxes only in 1919.

solve the model for the median voter political equilibrium and then we investigate the effects of changes on median productivity on the structure of taxation.<sup>16</sup>

### 2.2.1 Behaviour of Private Agents

#### The Households

The economy is populated by a continuum of agents indexed by  $i$ . The preferences of individual  $i$  are quasi-linear, namely:

$$u^i = c^i + V(x^i) + g \quad (1)$$

where  $c^i$  and  $x^i$  represents individual consumption and individual leisure whereas  $g$  represents a public good which is common to all agents. Moreover,  $V(\cdot)$  is increasing and concave in  $x^i$ . Individual consumption  $c^i$  is composed of goods produced and purchased in the market  $c_M^i$  and of goods produced at home that in turn are self-consumed  $c_H^i$ . So, total individual consumption equals:

$$c^i = \theta c_M^i + (1 - \theta) c_H^i \quad (2)$$

where  $0 < \theta < 1$  represents the level of economic development - with higher values denoting a more advanced economy characterized by higher levels of market consumption and lower levels of self-consumption.

The market budget constraint for each agent is:

$$c_M^i (1 + q_C) = w l^i \quad (3a)$$

where  $q_C$  is the consumption tax,  $w$  is the real wage rate and  $l^i$  the individual labor supply in the market.<sup>17</sup>

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<sup>16</sup> This is because franchise extension to the poorer segments of the population inevitably implies a reduction in the median productivity of those with the right to vote.

<sup>17</sup> Since the main focus of the paper lies in agrarian economies with limited tax capacity, as in the case of Greece, we decided to solve our model without the income/labor tax that could have burdened market production. It must be noted that most of the 19th century fiscal states of Western Europe relied heavily on indirect taxes (*custom taxes, excise duties* etc) as well as taxes on land (i.e. *land tithes*) (see e.g. Aidt and Jensen, 2009b). It must be noted that a permanent income tax was first introduced during the mid-19th century in a small number of economies (e.g., United Kingdom (1842), Austrian Empire (1849), Italy (1864)), and during the early 20th century in most of the current developed economies (e.g., Sweden (1902), France (1911), United States (1913), Germany (1920)). Moreover, in most of these economies tax revenues from income taxes stayed below 5 percent as a share of total tax revenues until 1905 (see Aidt and Jensen, 2009a for more details no this).

Home goods are produced by work at home,  $h^i$ , according to a Cobb-Douglas production function  $A_H(h_i)^\alpha$  ( $0 < \alpha < 1$ ), subject to a proportional tax  $q_H$ .<sup>18</sup> So, the consumption of goods produced at home for each agent is:

$$c_H^i = (1 - q_H)A_H(h_i)^\alpha \quad (3b)$$

Substituting (3a) and (3b) into (2) we get the total private budget constraint:

$$c^i = \frac{\theta w l^i}{1 + q_C} + (1 - \theta)(1 - q_H)A_H(h_i)^\alpha \quad (4)$$

Each agent has a private productivity parameter  $e^i$  so that individuals have different amounts of productive time available. More precisely, they face the following “time constraint”:

$$1 + e^i = l^i + x^i + h^i \quad (5)$$

We assume that  $e^i$  is distributed in the population with mean  $\bar{e}$  and median  $e^m$ . The government raises taxes using tax rates  $Q = (q_C, q_H)$ , in order to finance the public good  $g$ .

Households act competitively by taking the real wage rate  $w$ , the level of economic development  $\theta$  and the policy variables  $q_C, q_H$  as given. Substituting equations (4) and (5) into (1), the first-order conditions with respect to  $l^i$  and  $h^i$  give, respectively:

$$l^i = 1 + e_i - h_i - V_x^{-1} \left[ \frac{\theta w}{1 + q_C} \right] \quad (6)$$

$$h^i = \left[ \frac{\alpha A_H (1 - \theta)(1 - q_H)(1 + q_C)}{\theta w} \right]^{\frac{1}{1 - \alpha}} \quad (7)$$

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<sup>18</sup> Before the emergence of solid fiscal states -characterized by increased capacity to levy income taxes- a usual practice to raise tax revenues was the so-called *land tithes* that were compulsory taxes imposed on home production (which was mostly constituted by agricultural crops) (see e.g., Aidt and Jensen, 2009b and Booney, 1999 for more details on this). In the case of Greece, taxes on gross home production consisted by *dekati* (that was a special form of *land tithe*) and *epikarpia*. For more details on the tax system in case of Greece during the 19<sup>th</sup> century see Appendix A2 and A3.

Then, by substituting (6) and (7) into (5) and solving for  $x^i$  we get:

$$x^i = V_x^{-1} \left[ \frac{\theta w}{1 + q_C} \right] \quad (8)$$

### *The Firms*

The market economy is populated by  $j$  identical firms. We assume that the output produced in the market is governed by a linear, production technology  $y^j = A_M l^j$ .<sup>19</sup> Firms act competitively by taking the real wage rate  $w$  as given, and maximize their profits defined as:

$$\pi^j = A_M l^j - w l^j \quad (9)$$

where  $A_M$  is the level of productivity in the market and  $l^j$  the amount of labor employed by each identical firm  $j$ . The first order condition implies that:

$$w = A_M \quad (10)$$

so that  $\pi^j = 0$  in equilibrium. Equation (10) suggests that the real wage rate always equals to  $A_M$  in the market.

### *2.2.2. Average economic outcomes (labor supply, work at home, market and home consumption).*

Let  $L(q_C, q_H)$  denote the average labor supply in the market. By definition of the distribution:

$$L(q_C, q_H) = 1 + \bar{e} - \left[ \frac{\alpha A_H (1 - \theta)(1 - q_H)(1 + q_C)}{\theta A_M} \right]^{\frac{1}{1 - \alpha}} - V_x^{-1} \left[ \frac{\theta A_M}{1 + q_C} \right] \quad (11)$$

which is decreasing in  $q_C$  and increasing in  $q_H$ .

Similarly, let  $C_M(q_C, q_H)$  be the average market consumption, we can conclude that:

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<sup>19</sup> Our analysis follows a similar rationale to that developed by Ashraf and Galor (2011) according to which the output produced in the rural sector is governed by a Cobb Douglas production technology and the output produced in the manufacturing sector is determined by a linear production technology.

$$C_M(q_C, q_H) = \frac{A_M L(q_C, q_H)}{(1 + q_C)} \quad (12)$$

Let  $H(q_C, q_H)$  denote the average work at home. It can be easily verified that:

$$H(q_C, q_H) = \left[ \frac{\alpha A_H (1 - \theta) (1 - q_H) (1 + q_C)}{\theta A_M} \right]^{\frac{1}{1-\alpha}} \quad (13)$$

which is increasing in  $q_C$  and decreasing in  $q_H$ .

Similarly, let  $C_H(q_C, q_H)$  be the average consumption of home produced goods, we can conclude that:

$$C_H(q_C, q_H) = (1 - q_H) A_H \left[ \frac{\alpha A_H (1 - \theta) (1 - q_H) (1 + q_C)}{\theta A_M} \right]^{\frac{\alpha}{1-\alpha}} \quad (14)$$

It can be easily established from equations (6) and (11) that:

$$l^i = L(q_C, q_H) + (e_i - \bar{e}) \quad (15)$$

So, for each agent with private productivity  $e_i > \bar{e}$  we have  $l_i > L(q_C, q_H)$  and consequently (from equations (3a) and (12)) we get that  $c_M^i > C_M(q_C, q_H)$ . Similarly, equations (7) and (13) suggest that all agents decide the same amount of work at home  $h^i = H(q_C, q_H)$  and consequently (from equations (3b) and (14)) the same amount of self-consumption  $c_H^i = C_H(q_C, q_H)$  irrespective of their private productivity  $e_i$ .<sup>20</sup>

### 2.2.3 National government budget constraint

Having defined the average economic outcomes in the economy, we can now describe the budget constraint of the government. Tax revenues are raised through market consumption taxes ( $q_C$ ) and

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<sup>20</sup> Similarly we conclude that all agents decide the same amount of leisure irrespective of their private productivity,

$$x^i = X(q_C) = V_x^{-1} \left[ \frac{\theta A_M}{1 + q_C} \right]$$

taxes on home production ( $q_H$ ) in order to finance the public good  $g$  which is common to all agents. So, the budget constraint is as follows:

$$g = \theta q_C C_M(q_C, q_H) + (1 - \theta) q_H A_H(H(q_C, q_H))^a \quad (16)$$

where  $C_M(q_C, q_H)$  is the average market consumption [given by equation (12)] and  $H(q_C, q_H)$  is the average work at home [given by equation (13)].

#### 2.2.4 Determination on national tax policies

Substituting equations (4), (6)-(8), (10)-(14) into (1) we get that the policy preferences of agent  $i$  are:

$$W^i(q_C, q_H) = \frac{\theta A_M}{1 + q_C} (e_i - \bar{e}) + \theta A_M L(q_C, q_H) + V(X(q_C)) + (1 - \theta) q_H A_H(H(q_C, q_H)) \quad (17a)$$

The policy preferences of agent  $i$  can be rewritten as:

$$W^i(q_C, q_H) = K(e_i)S(q_C) + J(q_C, q_H) \quad (17b)$$

where  $K(e_i)$  is monotonic in  $e_i$  and  $S(q_C), J(q_C, q_H)$  are common to all agents. Therefore, agents have intermediate preferences and consequently a Condorcet winner always exists and is given by the bliss point of the median voter (i.e., the agent with the median productivity  $e^m$ ) (see e.g., Grandmont, 1978 for more details on this).

So, the political equilibrium is the policy preferred by the voter with the median productivity  $e^m$  and is given by the following equation:

$$\frac{\partial W^m}{\partial q_C} = \frac{\partial W^m}{\partial q_H} = 0 \quad (18)$$

where  $W^m$  denotes the indirect utility function of the median voter. Then, Appendix B shows:

**Proposition 1.** *For given levels of  $g$ , a decrease in the median productivity  $e^m$  of the electorate, increases  $q_C$  and decreases  $q_H$ . Therefore, the extension of the voting franchise to the poorer segments*

of the population -that implies a lower level of  $e^m$  for those with the right to vote- exerts a negative impact on the share of direct to indirect taxes ( $\frac{q_H}{q_C}$ ).

This effect of changing median productivity on the structure of taxation is in line with the stylized facts we observe in Table 1 and Figure 1 for the case of Greece that was a typical agrarian economy characterized by substantial levels of home production (and consequently self-consumption) during the whole 19<sup>th</sup> century.

Moreover, Appendix B shows:

**Proposition 2.** *The positive effect of changing median productivity  $e^m$  on the share of direct to indirect taxes ( $\frac{q_H}{q_C}$ ) is conditional on the size of  $\theta$  (i.e., the level of economic development). In particular, for lower values of  $\theta$  the positive effect of changing median productivity on the share of direct to indirect taxes is stronger.*

In the following sections we seek to investigate the empirical validity of *Propositions 1* and *2*. More precisely, in Sections 3 and 4 we explore whether *Proposition 1* holds in the case of the Kingdom of Greece that was a typical agrarian economy (characterized by substantial levels of home production) and in which the democratization episode of 1864 led to a decrease in the median productivity of the electorate. In turn, in Section 5, we investigate the empirical validity of *Proposition 2*, using a sample of 12 Western European countries which are characterized by different levels of economic development (and consequently different levels of home production) during the period 1841-1933. Specifically, we investigate whether the impact of franchise extension on tax composition is conditional on the phase of economic development, and consistent to that case of Greece for countries with a similar structure in the economy.

### **3. National analysis for the Kingdom of Greece**

#### *3.1 Change on the political regime*

The main explanatory variable in the national layer of our analysis is a dichotomous variable developed by Boix et al. (2013) that takes the value of 1 if a country is categorized as democratic and 0 otherwise. The key political factors that Boix et al. (2013) considered in order to codify a period as democratic are: (1) popular elections of the executive and legislature; (2) multiple parties competing in the

election; (3) unconsolidated incumbent advantage; and (4) at least half of the male electorate is enfranchised. According to these criteria, Greece is classified as democratic over the periods 1865-1914 and 1926-1933, and as autocratic the remaining years, namely 1833-1864 and 1915-1925.

During the first decade after independence (1833-1843), the political regime was an *absolute monarchy* under the reign of King Otto.<sup>21</sup> Only after the insurrection of 1843, which was led by Athenian garrisons backed by the demands of the Greek oligarchy, the ruler was compelled to adopt a constitution establishing a regime of *constitutional monarchy*. Remarkably, Greece was among the first three countries of the world who granted voting rights to almost all adult males aged 25 years old and over.<sup>22</sup> However, the new constitution was monarchical, with all executive and legislative powers vested in the King. Moreover, this massive reform was mainly the result of the absence of a dominant, cohesive elite faction that would be able to impose a clear-cut authoritarian solution. In particular, the political environment consisted of evenly balanced elite factions that viewed enfranchisement of the illiterate rural population (~90 percent) as a good system of adjudicating their conflicts, while restricting the power of the King (see Alivizatos, 2011; Kalyvas, 2015, pp.50-52).<sup>23</sup>

In 1862, King Otto was overthrown by a rising of the guard and people of Athens. A series of events led to the appointment of a new monarch, George I, and after long debates the new constitution of 1864 established a *crowned democracy* with universal suffrage for all males aged 21 years old and over. According to the new constitution, instead of a ballot, voters could cast a small lead ball into one of the ballot boxes allocated to each one of the candidates standing for elections (see Figure C1 in Appendix C). Interestingly, this reform was not part of the constitution when it was drafted initially. It was proposed by the delegates of the Ionian Islands in their first participation in the National Assembly after the annexation of this region in Greece in 1864 (Alivizatos, 2011). Actually, the Ionian Islands had long tradition applying this method of voting, even from the period that were under the Venetian rule between the 14th and the 18th centuries (see e.g., Sotirelis, 1991). This external shock which facilitated voting without a ballot, is of paramount importance since it allowed illiterates to participate in the electoral process without intervention of third parties, transferring therefore real power to the people.

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<sup>21</sup> Actually, until Otto reach the majority of age (June 1, 1835), his sovereign rights in Greece were exercised by the so-called regency, which was made up of three councils appointed by the King of Bavaria Ludwig I.

<sup>22</sup> Only paying guests or apprentices were excluded from this right. The other two countries that adopted universal male suffrage before Greece were France and Liberia (see Przeworski, 2009). In France, it was introduced with the constitution of 1793, but it never went into effect and no elections were held under it. Liberia proceeded in universal male suffrage in 1839, but voting rights were restricted again in 1847.

<sup>23</sup> According to Przeworski (2006), a political environment of evenly balanced elite factions is a *sine qua non* for a stable, self-enforcing democratic regime. In other words, democracy survives only when all the political forces that could overthrow it agree that democratic elections are a good system of adjudicating their conflicts or at least are preferable over the feasible alternatives.

Despite various incidents of political instability, parliamentary governments functioned regularly for many decades and until 1914. However, disagreements between King Constantine, who succeeded King George after his assassination in 1913, and the Prime Minister Eleftherios Venizelos initiated a prolonged period of political instability. According to the Boix et al. (2013) classification, Greece is categorized as autocratic during the period of 1915-1925. This categorization is based on Greece's experience of a deep *National Schism*, the start of the Greco-Turkish war, and two military coups in 1922 and 1925 - each lasting two years. From 1926 until 1933, the remaining years of our sample, political stability was restored and Greece once again is classified as democratic.

### 3.2 Empirical specification for national analysis

To test the fiscal effects of the radical reform of 1864 in Greece at the national level, we estimate the following equation:

$$fiscal\ policy_t = \alpha_0 + \alpha_1 fiscal\ policy_{t-1} + \alpha_2 democracy_t + \beta X_t + \gamma_t + \varepsilon_t \quad (19)$$

where *fiscal policy<sub>t</sub>* stands for fiscal indicators, as described in Section 2.1; *democracy<sub>t</sub>* takes value 1 if Greece is categorized as democratic in year *t*, and 0 otherwise; *X<sub>t</sub>* is the vector of control to be discussed below;  $\gamma_t$  is a trend that measures the effect of time on the dependent variable; and  $\varepsilon_t$  is the error term. In all specifications, in line with many previous studies (e.g., Aidt et al., 2006), we include a lagged dependent variable on the right-hand side of our estimated equation to control for the fact that the evolution of tax policy exhibits a high degree of persistence.

Regarding the additional covariates, first, we consider the variable *GDP per capita*, the natural logarithm of real GDP per capita, to control for the effect of economic development on the level and composition of taxation (see Wagner, 1883). Related to that, we expect the structure of the economy, and more specifically the reliance on agricultural activity, to be a crucial determinant of the various tax bases and how taxes are levied. For this reason, we employ the percentage of population living in cities of less than two thousand people (denoted as *agricultural rate*), as proxy for the relative magnitude of the agricultural sector.<sup>24</sup> Second, we employ the variable *old*, which is defined as the percentage of the population aged 65 or older. According to Lindert (1994), the ageing of the

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<sup>24</sup> We use this variable, as provided by Dertilis (1993), to proxy for the size of the agricultural sector in Greece, since population statistics first became available in 1828 whereas occupational statistics in 1861. This allows us to avoid extrapolation of occupational data back in 1833 -the first year of our sample. However, when using the first occupational statistics from the census of 1861 we found that the percentage of the core occupations in agriculture -landowners, farmers and peasants- account for 63 percent of the total labour force. Moreover, when taking also into account other occupations related to the agricultural sector (e.g., muleteers, merchandisers and workers) this figure increases above 70 percent and very close to the figure obtained from population statistics.

population significantly increased the demand for intergenerational redistribution in Europe during the period of 1880-1930. Therefore, we expect a positive relationship between age structure and government size.

A number of dummy variables are also included in our empirical specification. We intended to use the population size in order to control for the possibility that the public sector exhibits economies of scale (see, e.g., Mulligan et al., 2004; Aidt et al., 2006). However, we abstain from using this variable in our specification since it is highly correlated with the variable *agricultural rate*. Instead, we construct the dummy variable *population spikes*, which takes the value of 1 in the years that we observe significant increases in the population (e.g., annexation of regions), and 0 otherwise. Our next covariates allow us to control for the impact of economic crises on the implementation of fiscal policy in Greece. The variables *debt crisis* and *currency crisis* take the value of 1 if a debt (domestic or external) or a currency crisis, respectively, occurred during the year, and 0 otherwise. Finally, we include two dummy variables to control for the pressure of *internal instability* and *wars* on the implementation of fiscal policy. Table C1 in Appendix C provides descriptions, data sources, and descriptive statistics for all variables included in our regressions analysis in Section 3.

### 3.3 Baseline results

Our baseline results are reported in Table 2. In column (1), the main variable of interest, *democracy*, bears a non-significant effect on the variable *total taxes*. Therefore, our analysis suggests that the voting franchise extension of 1864 did not lead to fiscal expansion as suggested by the relevant theoretical literature (see e.g., Meltzer and Richard, 1981) and previous historical empirical studies from Western European countries (see e.g., Aidt et al., 2006; Aidt and Jensen, 2009b). However, this empirical finding fits our theoretical priors since the Kingdom of Greece was an agrarian economy characterized by a low tax collection capacity. Moreover, this result is in accordance with previous historical studies for Greece suggesting that total tax revenues remained relatively stable during the whole 19th century (see Dertilis and Kostis, 1995; Kostis, 2006, pp.307-316).

In contrast, in column (2) *democracy* enters with a negative and statistically significant coefficient at the 1% level. This result highlights the significant reduction in the share of *direct to indirect taxes* after democratisation. Moreover, when *direct taxes* are further decomposed between *rural taxes* and *urban taxes* [in columns (3) and (4) respectively] we see that *democracy* bears a negative and highly significant coefficient in the former, whereas no effect is found on the latter. Finally, in columns (5) and (6), we investigate the impact of franchise extension on *indirect taxes*. As can be easily verified, *democracy* bears a positive and statistically significant coefficient when related to *customs taxes* at the 1% level.

[Insert Table 2 here]

These effects are consistent with our theoretical priors. As we have already noted, given the presence of a large home production sector, a decrease on median productivity after the franchise reform induces increases on *indirect taxes* and decreases on taxes that burden home production (i.e., *rural taxes*). Therefore, a franchise extension to the poorer segments of the population is expected to exert a negative impact on the share *direct to indirect taxes*. Obviously, these changes were in favour of the rural population and at expense of the population living in urban areas. This is because rural population at the one hand was affected positively by decreases on land and assessed taxes but also it was not substantially harmed from increases on indirect taxes due to the ability of self-consumption that was inevitably higher in rural areas.<sup>25</sup> In contrast, the population that was living in urban regions -including its poorer segments- did not exhibit the option of self-consumption and thus it was significantly harmed by increases on indirect taxes. Our analysis suggests that there were political economy incentives behind observed shifts in the implemented tax policy. The Greek authorities decided this composition of taxation in order to ensure a minimum social cohesion and moreover to satisfy the majority of their electorate who constituted by peasants and farmers living in rural areas (see Dertilis, 1993; Palairret, 1979).<sup>26</sup>

It must be noted that obtained empirical findings -especially concerning the increases on *custom taxes*- cannot fully exclude alternative theoretical explanations. For instance, one may argue that countries characterized by poor fiscal capacity and low administrative capabilities inevitably rely heavier on international trade taxes which are a more easy-to-collect-tax (see e.g., Besley and Persson, 2011, 2013), or that increases on *custom duties* act as a mean of protection of the domestic production from international competition. Both of these arguments may sound sensible but fail to provide satisfactory answers for the full set of stylized facts under consideration. In particular, they fail to provide a clear-cut explanation for the decision of the Greek authorities to keep *total taxes* relatively constant and to combine increases in *indirect taxes* with reductions in *rural taxes*. After all, even if we assumed that *rural taxes* were a more difficult-to-collect tax, there is no economic argument supporting

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<sup>25</sup> It must be noted during that period the Kingdom of Greece was characterized by a noteworthy equal distribution of land and therefore decreases in *rural taxes* were in favour of the large majority of peasants and farmers. This is because after independence, Greek authorities nationalized the great bulk of lands that belonged to Ottoman landowners in most of the Greek regions. In turn, with the Law of Sotiropoulos in 1871 Greek authorities distributed officially these lands (the so-called "National Lands" *Ethnikes Gaies*) to the peasantry (see Dertilis, 2015)

<sup>26</sup> Along these lines, Brender and Drazen (2007) suggest that the attitude of the citizenry towards democracy is important in preventing democratic collapse, and fiscal manipulation can act as an instrument to convince them that "democracy works". In line with this argument, Kammass and Sarantides (2016) show that when the democratic regime is not fully consolidated (i.e., new democracy), incumbents implement pre-electoral redistributive policies in order to signal that "democracy works", thereby preventing a reversion to an autocratic status quo ante at a time of the regime's extreme vulnerability.

their remarkable reduction and that it took place after democratisation. Similarly, the protectionist argument fails to provide a sensible explanation of why trade policy should be combined by decreases in *land tithes* and increases in a series of domestic *market taxes*. It is clear from the above, that alternative arguments which do not highlight the distributional implication of the implemented tax policy, and the potential political economy incentives behind the policy shifts, are at best weak.<sup>27</sup>

We also estimate the long-run effect of democratisation on fiscal policy instruments. To do so, the coefficient of the variable *democracy* ( $\alpha_2$ ) from equation (19) should be divided by  $(1 - \alpha_1)$ , where  $\alpha_1$  is the coefficient of the lagged dependent variable. According to our estimates, the change in the composition of taxation in favour of indirect taxes is driven mainly by the long-run decrease in the share of *rural taxes* by 8.9 percent, and by the long-run increase in the share of *customs taxes* by 14.55 percent. Given that the mean value of the former is 32.48 percent and of the latter is 34.07 percent, it is clear that this effect is quantitatively sizable.

To close, we discuss our empirical findings concerning the rest of the covariates reported in Table 2. First, as expected, the lagged dependent variable bears a positive and statistically significant coefficient in all our estimates.<sup>28</sup> Moreover, we observe that the variables that capture the level of economic development, namely *GDP per capita* and *agricultural rate* enter with non-significant coefficients in most of the specifications. As expected, the variable *debt crisis* decreases the size of tax revenues, whereas the variable *currency crisis* is found to decrease the share of direct to indirect taxes mainly through its negative impact on *urban taxes*. Finally, the variable *internal instability* deteriorates the level of tax revenues.

### 3.4 Sensitivity analysis

In this section, we examine the robustness of the results obtained in Table 2. First, we check the sensitivity of our results to the set of covariates included in the analysis. Including a fairly large set of covariates, limits degrees of freedom, whereas coefficients could be unstable in the presence of collinearity. For this reason, we choose to exclude from the analysis controls *debt crisis*, *currency crisis*, *internal instability* and *wars*. This is because some of these covariates are likely, at least in part, to be effects of the regime type - for instance the occurrence of debt and currency crises. Such crises are endogenous to political decisions that may, in turn, differ systematically between democratic and non-democratic periods. Hence, the estimated effect of *democracy* may suffer from post-treatment

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<sup>27</sup> For an alternative political economy argument that builds on a theoretical model of trade in vertically differentiated products and explains the heavy reliance of developing economies on revenues from tariffs, see Moutos (2001) and Adam et al., (2011).

<sup>28</sup> To assess if the dynamic specification can affect the interpretation of our results, we transformed equation (19) to an Error Correction Model (ECM). As can be seen in panel A of Table C4 in Appendix C, the qualitative and quantitative results we obtain for the long-run effects of democratisation on fiscal instruments are essentially the same to those obtained from the estimates in Table 2.

bias. However, the qualitative results presented in panel A of Table 3, remain essentially the same as those depicted in Table 2.

[Insert Table 3 here]

Next, we check whether our results remain qualitatively similar when the time period of our sample is restricted from 1845 to 1915. Our motivation to employ this restricted sample is twofold: First, as already mentioned, the first significant political reform that increased the political power of the agricultural population took place in 1844. Therefore, if our results in the restricted sample continue to hold, we demonstrate that the second more radical constitution of 1864 is indeed a significant determinant of our results. Second, we choose to limit our sample prior to 1915, since after that year and for a decade, the Kingdom of Greece faced a prolonged period of instability with internal and external conflicts - with more important incidents the *Great Division* of Greece (the so-called *National Schism*) and the *Greco-Turkish war of 1919-1922*.<sup>29</sup> These events seem to have affected significantly the size and composition of taxation - see Table 1 and Figure 1- so we opt to restrict our sample before their start. As can be seen in panel B of Table 3, our results for the restricted sample continue to hold. A notable difference though is that the effect of franchise extension on the share of *direct* to *indirect taxes* appears to be significantly higher.

The final check we report in panel C of Table 3 is to restrict the time period of our sample even further and in particular from 1853 to 1879. This time period is identical to the time period of our sample when we proceed to the regional analysis for the Kingdom of Greece in the next section. The starting time period of our sample in the regional analysis is dictated by data availability and it is the first year for which tax data at the province level become available. The ending time period of our sample in 1879 guarantees a consistent set of instruments through which tax revenues are collected, and at the same time territorial stability regarding the provinces in which these taxes are levied. Regarding tax instruments, during 1853-1879 the only tax innovation we observe concerns the corporate tax, which is established in 1876 but contributes only up to 0.5 per cent of annual tax revenues until 1879. It was only in 1880 that the *excise tax* is introduced, the second most fruitful indirect tax of the Greek state after *custom duties on imported goods*. With respect to territorial stability, during 1853-1879 only the Ionian Islands are annexed in Greece in 1864, covering around 5

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<sup>29</sup> The *National Schism* that split Greece into two entities was the result of a series of disagreements between King Constantine I and Prime Minister Eleftherios Venizelos regarding the foreign policy of Greece.

per cent of the total land area of the Kingdom of Greece.<sup>30</sup> Due to the limited size of our sample in this specification we employ the limited set of controls applied in panel A. As can be seen in panel C, results for one more time indicate the replacement between *rural taxes* and *customs taxes* after the democratisation episode in 1864.

In Table C4 in Appendix C we report some additional robustness checks. First, as already mentioned, in panel A we report estimates of the long-run effect of democratisation using an ECM. Second, in Panel B we substitute Boix et al.'s (2013) measure of democracy, with the variable *polity2* from the Polity IV Project (Marshall and Jaggers, 2010). This index has been applied as a tool to classify political regimes (democracy versus autocracy) in a large number of studies (see e.g., Haber and Menaldo, 2011; Harrison and Wolf, 2012), though a closer look at it suggests that it mainly focuses on the institutional side of political competition (see, Vanhanen, 2000). However, it offers the advantage of varying from -10 (extreme autocracy) to +10 (perfect democracy), thus allowing for a larger variation in the sample. Third, in panel C we proceed by re-estimating the empirical model presented in Table 2 by skipping observations with a standardized residual above 1.96 or below -1.96. Finally, as it is possible that the errors in Table 2 are correlated between the estimated equations, in panel D we re-estimate our baseline specification by the Seemingly Unrelated Regression Equations (SURE) model. As can be easily verified, in all alternative cases, obtained empirical findings are qualitatively identical to those presented in Table 2.

#### **4. Regional analysis for the Kingdom of Greece**

In this section, we seek to provide further evidence in favour of our theoretical priors by employing regional data. To this end, we investigate whether the negative effect of democratization on *rural taxes* was more intensive in provinces characterized by higher share of population employed in the agriculture. We cannot apply a similar strategy to examine the distribution of *customs taxes* since regional information for *custom duties on imported goods* is limited until 1863, whereas from 1864 onwards only their aggregate value at the national level is reported.

##### *4.1 Rural taxes*

Tax revenues in the Kingdom of Greece were collected in *public cashiers* within each municipality and in a limited number of custom houses across the Greek territory (see Section A3 in Appendix A). The administrative division of Greece during the 19<sup>th</sup> century consists of *regions (peripheries)*,

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<sup>30</sup> In 1881 the Convention of Constantinople was signed between the Kingdom of Greece and the Ottoman Empire, resulting in the cession of the region of Thessaly and a part of southern Epirus (i.e., Arta) to Greece - of total area 13.395 square kilometres, or 21 per cent of the Greek territory at that time.

*provinces* (i.e., *eparxiai*), *municipalities* and *communities*. Our regional analysis uses province-level data for the years 1853-1879, since this is the lower level of aggregation for which tax data are available. All final regional fiscal accounts (i.e., *Apologismoi*) employed in the current study were tracked down in the HANBG. For the years 1853-1855 data were provided in microfilms, whereas from 1858 onwards from the available volumes as published by the Greek state back in the 19<sup>th</sup> century. Unfortunately, regional accounts for years 1856 and 1857 were missing from the collection.

Figure C2 in Appendix C reports the fiscal revenues of the *land tax* for the year of 1863. Our sample for the regional analysis includes 43 tax administrative units. Figure C3 shows the borders of the 48 provincial units of the Greek state before the annexation of Ionian Islands - the so called *old Greece*- and the adjustments that need to be made for the final 43 tax administrative units of our sample.

To construct our variable *rural taxes* for the regional analysis, we use rural tax receipts - consistent with the national analysis- that are now expressed in real per capita terms. Population statistics are taken from the censuses of 1853, 1861, 1870 and 1879, which are interpolated between census years to fully populate the panel. Moreover, to express our variables in real terms we use data for changes in the price level from Lazaretou (2014), who made a heroic effort to compose data, but also gather data from various sources (e.g., Kostelenos et al., 2007), with reliable estimates of the magnitude and the trends of the Greek economy for the period of 1830-1939.

#### 4.2 Agricultural rate

To estimate the relationship between rural tax burdens and the agricultural rate we exploit the variation in the concentration of the peasantry across provinces. Our key independent variable, *farmers and peasants 1861*, refers to the percentage of peasants and farmers to the total population at the province level according to the occupational statistics of the 1861 census. We prefer this fixed measure of 1861 since it is less likely to be endogenous to taxation trends than a population share that changes over time (see e.g., Cascio and Washington, 2013; Carruthers and Wanamaker, 2015).

As can be seen in Table C2 in Appendix C, there is significant variation in the geographic distribution of the peasantry across provinces. In particular, the average of our main variable *farmers and peasants 1861* in the sample is 17.08 percent, the median is slightly to the right of the mean (17.95 percent), with lower and higher values 2.84 and 28.43 percent respectively. Of course, population shares across provinces are not exogenously assigned and can be correlated with potential confounders. For instance, peasantry concentration can be confounded by climatic and geographic factors that can enhance agricultural productivity. If the province characteristics that vary systematically with the value of this variable are also correlated with tax outcomes, a model that regresses these outcomes on *farmers*

and *peasants 1861* would return biased and inconsistent estimates. To tackle this issue, our estimations include province fixed effects with the aim to absorb any such unobserved, province-specific and time-invariant characteristics that could confound the true relationship.

#### 4.3 Empirical specification for regional analysis

To estimate the relationship between peasantry concentration and rural tax receipts after the reform of 1864 we employ the following Difference-in-Difference (DD) specification:

$$rural\ taxes_{it} = \alpha_0 + \alpha_1 democracy_t * farmers\ and\ peasants\ 1861_i + \theta_i + \theta_t + t * \theta_r + \beta X_{it} + \varepsilon_{it} \quad (20)$$

where *rural taxes<sub>it</sub>* denotes real per capita tax receipts from agricultural and livestock production in province *i* at time *t* (in 1860 Drachmas); *democracy<sub>t</sub>* is an indicator variable equalling one in years greater than or equal to 1865, and 0 otherwise; *farmers and peasants 1861<sub>i</sub>* represents the measure of peasantry concentration described above. The model also includes province,  $\theta_i$ , and year fixed effects,  $\theta_t$ , to control for all time-invariant province characteristics and shocks common to all provinces, respectively. We also allow provinces to diverge over time by including province-specific time trends,  $t*\theta_r$ . The matrix of province-level observable characteristics,  $X_{it}$ , includes (province) *population* and *population squared*, to account for differences between provinces with large and smaller concentration of population and their connected non-linearities; *population density*, a commonly used proxy of prosperity and urbanization; and the share of *delayed payments* of rural tax receivables. The latter variable is defined as the percentage of delayed rural tax payments to the total tax receivables expected by the state. We control for this variable in order to isolate from our outcome variable (tax receipts) any effect that stems from delayed payments. This variable allows us to capture incidences within the Greek territory that preclude tax collection or submissions of locally collected taxes to the Greek state.<sup>31</sup> These four covariates are the only that can be calculated without extrapolation. Finally,  $\varepsilon_{it}$  is an error term. To address serial correlation concerns and to allow for heteroscedasticity, the standard errors are clustered at the province level (Bertrand et al. 2004).

This empirical specification directly relates to the idea of using the 'dosage' of suffrage in examining its effect on political and economic outcomes. It was first applied by Berlinski and Dewan (2011), and now is a widely employed technique in the relevant literature (Cascio and Washington,

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<sup>31</sup>For instance, in 1861 the share of delayed payments of rural taxes was 9.2 per cent, while the following year that King Otto was expelled from Greece it increased at level close to 20 percent. It should be noted that *delayed payments* is correlated at a moderate level close to 15 percent with the variable *farmers and peasants 1861*.

2013; Vernby 2013; Larcinese 2014; Carruthers and Wanamaker 2015). The merit of this method is that it allows to identify how local authorities, or the electorate at the local level, react to an exogenous shock imposed by the central/national government. In our case, though, the motivation differs since we are interested to examine changes in the behaviour of the central government that affects directly the geographical distribution of a policy variable (see e.g., Jablonski, 2014; Kroth et al., 2016).

As described in Section A3 in Appendix A, during that period the distribution of the rural tax burdens within the Kingdom of Greece was actually decided in two stages. First, for each tax instrument the central government was budgeting the expected amount of revenues for each administrative unit. This amount was determined by production capability, the tax rates set by the state, but also, and more importantly for our study, by the willingness of the state to collect taxes consistently within the Greek territory. Second, local notables and authorities (depending on the tax instrument) were monitoring on behalf of the state the process so that the expected amount of taxes for each administrative unit is collected. Both the central government and the local elites - acting as intermediaries between elected officials and the local population through their own clientelistic networks - had political economy incentives to implement a tax policy that was in favour of farmers and peasants, especially after the franchise extension that constituted the latter as the ultimate political majority. However, it should be noted that before the absorption of the tax policy by the local elites, it was in the discretion of the central government to apply the tax rules consistently for all regions of the Kingdom. A remarkable example is the province of Gytheio that average collected *rural taxes* per capita do not exceed 0.1 between 1853-1879, when the average value of our sample is 6.13. One explanation for this extreme phenomenon is that part of *rural taxes* from this province were collected in the nearest custom house (see Petmezas, 2003), therefore not included in the regional account. However, another significant reason is the unwillingness of the state to impose its policies in this area that had a long tradition of protesting against the state - even from the era of the Ottoman Empire (see Aroni-Tcichli, 2009). We proceed in the regional analysis because of the significant discretion of the state to distribute tax burdens differently, arguing that its willingness to be consistent is affected negatively by the concentration of *peasants and farmers* across provinces - i.e., in regions where more home production (and therefore more political power) is concentrated after the reform we expect a higher reduction in *rural taxes* per capita.

#### 4.4 Results

Columns (1)-(3) in Table 4 list the coefficient from the DD specification in equation (20). Column (1) includes province and year fixed effects, whereas in columns (2) and (3) we add progressively regional time trends and the additional covariates. As can be seen, the DD coefficient (*democracy\*farmers and*

*peasants*) is negative and statistically significant, and the most moderate estimate in column (3) indicates that a percentage point increase in the agricultural population is associated with a decrease in *rural taxes* per capita after democratization by 0.078 points. Evaluated at the mean value of the agricultural rate proxy this implies a 1.33 points decrease in *rural taxes*. Using the mean value of *rural taxes* before 1864, this effect accounts a 17 percent decrease in *rural taxes* in the province with the average size of peasantry concentration. Therefore, consistent with Proposition 1, we obtain clear indications that in provinces characterized by more extensive home production -as proxied by the number of *peasants and farmers* in the population - the central government reacts more leading to a more pronounced reduction in *rural taxes*.

[Insert Table 4 here]

Next we turn to the question of whether the estimated effects were fleeting or persisted over time. To explore this possibility, equation (20) is transformed in the following way:

$$rural\ taxes_{it} = \alpha_0 + \alpha_1 T_{1865,1868} * peasants\ and\ farmers\ 1861_i + \alpha_2 T_{1869,1872} * peasants\ and\ farmers\ 1861_i + \alpha_3 T_{1873,1876} * peasants\ and\ farmers\ 1861_i + \alpha_4 T_{1877,1879} * peasants\ and\ farmers\ 1861_i + \theta_i + \theta_t + t * \theta_r + \beta X_{it} + \varepsilon_{it} \quad (21)$$

this functional form allows the relationship between agricultural rate and rural taxation to vary over four time horizons: 1865-1868, 1869-1872, 1873-1876, and 1877-1879, each relative to the omitted window of 1853-1864. Results of equation (21) are displayed in column (4). As can be seen, the coefficient is negative and statistically significant between 1865-1872, and 1877-1879 indicating a relative constant relationship over time after the reform of 1864.

However, it remains possible that heterogeneous trends are present and induced decreases in *rural taxes* in high-agricultural provinces, even in the absence of democratization. To examine this possibility, we restrict our sample prior to 1864 and assess the importance of our key independent variable in determining trends in rural taxation. Specifically, we modify equation (20) to estimate the following for fiscal years 1853-1863:

$$rural\ taxes_{it} = \alpha_0 + \alpha_1 trend_t + \alpha_2 trend_t * farmers\ and\ peasants\ 1861_i + \beta X_{it} + \theta_i + \varepsilon_{it} \quad (22)$$

The main aim is to test whether high *farmers and peasants 1861* provinces had different trends before 1864 (i.e.,  $\alpha_2 \neq 0$ ). The results, reported in column (5), show a downward trend in *rural taxes*, but more

importantly no evidence of a differential trend in rural taxation amongst provinces related to the size of the agricultural rate.

Our estimations so far rely on a measure of peasantry concentration that includes peasants and farmers. From this calculation, deliberately we exclude two other occupational categories provided in the census of 1861, the *landowners* and the *workers* despite the fact that especially the former group earns its income directly from agriculture. *Landowners* are excluded because it is expected to belong to a higher income class in comparison to *farmers and peasants*. *Workers*, on the other hand, because they can be occupied, especially in more developed areas, in activities other than the agricultural sector. Thus, considering only *farmers and peasants* guarantees a minimum level of income and occupational homogeneity in the group that dominated the structure of the Greek economy during the 19<sup>th</sup> century. However, in columns (6) and (7) we experiment with variables *landowners 1861* and *workers 1861*, respectively, to examine the possibility of association of other agriculturally-related occupations with *rural taxes*. As can be seen, results in both cases are statistically insignificant.

Furthermore, as already mentioned, for the main indirect tax of period 1853-1879, *customs taxes*, regional information is not available. Despite that, we can construct a measure of *indirect taxes* per capita for the remaining tax categories of that period. These include charges on stamping notarial deeds, court fees, and ‘various other rights’ which represent harbour dues, consular charges and other similar fees. In column (8), a specification similar to equation (20) returns no significant relationship between agricultural intensity and *indirect taxes* after the democratization. This result provides additional evidence that tax changes after 1864 were targeted to favour the new political majority, through decreases in *rural taxes*, and it is not simply a generalised downward trend in taxation in agricultural areas.

Finally, in order to provide further evidence of potential political economy motives behind observed shifts in the implemented tax policy, our analysis incorporates the variable *voter turnout* that captures the percentage of actual voters in the national elections of 1879 among those that were enfranchised. The choice of year is dictated by data availability, since this is the only year during 1853-1879 that turnout statistics were reported by Greek authorities. Our new Difference-in-Difference-in-Difference (DDD) specification that exploits variation also along the dimension of political participation has the following form:

$$rural\ taxes_{it} = \alpha_0 + \alpha_1 democracy_t * farmers\ and\ peasants\ 1861_i + \alpha_2 democracy_t * voter\ turnout_i + \alpha_3 democracy_t * farmers\ and\ peasants\ 1861_i * voter\ turnout_i + \theta_i + \theta_t + t * \theta_r + \beta X_{it} + \varepsilon_{it} \quad (23)$$

where *voter turnout* is our proxy for the propensity of the population at the province level to participate in the electoral process after democratisation. The rest of the variables are defined as earlier. It should be noted that the estimated  $\alpha_1$  in this specification captures the expected effect of *democracy\*farmers and peasants 1861* when voter turnout is zero. The coefficient of interest here is  $\alpha_3$ , which indicates how differences in peasantry concentration between provinces affect *rural taxes* as the size of *voter turnout* after the reform increases. Consistent with our hypothesis the DDD coefficient in column (9) turns out negative and statistically significant at the 1 percent level. Therefore, we get evidence that that the intensity of political participation of the peasantry at the province level matters for the size of reduction in rural tax burdens.

## 5. The conditional effect of suffrage extension in Europe

In this section we explore the effect of democratisation on the size and the composition of taxation for a sample of 12 Western European countries for the period 1841-1933. This allows us to investigate the empirical validity of Proposition 2 and therefore to add generality to our results.<sup>32</sup> The main hypothesis under investigation is that the impact of franchise extension on the tax structure is conditional on the phase of economic development, and consistent to that case of Greece for countries with a similar structure in the economy. In contrast to Greece, most of these European countries were not typical agrarian economies during the period of their democratization. In particular, their average figure of the workforce occupied in the agriculture sector upon democratisation is half that of Greece, namely about 38 percent (see Figure 2). Two more points are worth noting about this Figure. First, the only country, according to Boix et al. (2013), that democratised before Greece, is Switzerland in 1856, with almost 80 percent of the adult male population enfranchised (Flora et al., 1983). Second, it is evident that some countries (e.g., Finland and Italy) are closer to the Greek case, whereas others differ significantly.<sup>33</sup>

[Insert Figure 2 here]

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<sup>32</sup> The countries in our sample are: Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and United Kingdom.

<sup>33</sup> This difference between Greece and Europe is rather understated, if we consider that Boix et al.'s (2013) classification requires, among others, more than 50 percent of the male population to be enfranchised for a country to be qualified as democratic. In the case of Greece after the big voting reform in 1864 almost 100 percent of the male population was granted voting rights.

To test the effect of democratisation on fiscal outcomes for the European sample, we estimate the following equation for the period 1841-1933:<sup>34</sup>

$$fiscal\ policy_{it} = \alpha_0 + \alpha_1 fiscal\ policy_{it-1} + \alpha_2 democracy_{it} + \alpha_3 agricultural\ rate_{it} + \alpha_4 Democracy_{it} * agricultural\ rate_{it} + \beta X_{it} + \gamma_i + \delta_t + \varepsilon_{it} \quad (24)$$

where  $fiscal\ policy_{it}$  is a fiscal indicator in country  $i$  in year  $t$ ;  $fiscal\ policy_{it-1}$  is the respective lagged dependent variable;  $democracy_{it}$  is a dummy variable that takes value 1 if country  $i$  in year  $t$  is categorized as democratic, and 0 otherwise;  $agricultural\ rate_{it}$  is the percentage of the workforce in agriculture;  $X_{it}$  is the vector of additional control variables;  $\gamma_i$  and  $\delta_t$  correspond to country and time fixed effects, respectively, and  $\varepsilon_{it}$  is the error term.<sup>35</sup> As can be seen, equation (19) has been augmented with the interaction term  $democracy_{it} * agricultural\ rate_{it}$ , in order to test our second hypothesis.

The focus on these European countries is due to the fact that Flora et al. (1983) provides directly comparable fiscal data to that employed for the case of Greece. Moreover, although these European countries had significant differences in the rules and institutions that governed fiscal policy during that period, they share similar economic and political characteristics that make them an appealing sample for panel analysis.<sup>36</sup> The tax variables that we employ in this section are identical to those of Section 3. Moreover, we employ the same controls, with only one exception. More specifically, for the case of Greece we preferred the variable *population spikes* because the actual population size was highly correlated with the *agricultural rate*. However, in the case of European countries we do not face the same limitation. For this reason, we construct the variable *population*, which is defined as the natural logarithm of the population of the country. Table C3 in Appendix C provides descriptions, data sources, and descriptive statistics for all variables included in our regressions analysis in Section 5.

Table 5 reports our results for the European sample. As can be seen in panel A, the variable *democracy* is positively correlated with *total taxes* and the share of direct to indirect taxes. Moreover, we observe that these changes are driven by the increase in *urban taxes* and the decrease of both categories of indirect taxes, *customs taxes* and *market taxes*. However, and more importantly, these

<sup>34</sup> Although for some countries fiscal data are available from year 1833 onwards (e.g., UK, France), due to data limitations of other variables, our sample starts in 1841.

<sup>35</sup> The inclusion of a lagged dependent variable introduces a potential bias in the dynamic Fixed Effects model by not satisfying the strict exogeneity assumption of the error term  $\varepsilon_{it}$ . As shown in the literature, the estimated bias of this formulation is of order  $1/T$ , where  $T$  is the time length of the panel, even as the number of countries becomes large (see, among others, Nickell, 1981). Since, the average length of our panel ranges from 41 to 60 years -in different specifications- in our case, the potential bias appears to be negligible.

<sup>36</sup> An obvious example is the case of Germany, where the central government reserved the right to levy and collect a significant amount of direct taxes close to the beginning of WWI (Ritschl, 2003).

effects are conditional on the structure of the economy as revealed by our results for the interaction term *democracy\*agricultural rate*. The interaction term is negative and statistically significant when related to the variables *total taxes*, *direct/indirect*, *urban taxes*, while the opposite holds when related to *customs taxes* - the effect on *market taxes* is also positive but insignificant. Therefore, our empirical findings suggest that the phase of economic development, and the consequent structure of the economy, results in a differentiated effect of democratisation on the size and structure of taxation.

[Insert Table 5 here]

To further elucidate this, we calculate the partial derivative for each dependent variable in Table 5, with respect to the variable *democracy* at reasonable values of the *agricultural rate*. Specifically, these values are the mean of our sample (38.32), one standard deviation below the mean (23.22) and two standard deviations above the mean (68.52). The lower value corresponds to countries like the UK, the mean value of 38.32 captures cases like Norway, where the agricultural sector is at the margins to be the most crowded segment of the society, and finally the value 68.34 is close to cases like Finland or Italy. What we observe in panel B of Table 5 is that when the agricultural sector dominates the economy, as in the case of Greece, the size of the public sector remains unaffected after democratisation, whereas the composition of tax revenues changes in favour of indirect forms of taxation. At the mean of our sample, democratisation still has no effect on the size of the public sector, but the composition of tax revenues changes now in favour of direct forms of taxation. Finally, at lower values of the *agricultural rate*, democratisation has a positive effect on the size of the public sector, and on direct forms of taxation. To explore more thoroughly the conditional effect of democracy on the structure of taxation, Figure 3 plots how the regime change affects the variable *direct/indirect* at different values of the *agricultural rate*. As shown, consistent to our theoretical priors in Proposition 2, in the first half the relationship that the agricultural sector dominates the economy the negative effect of *democracy* on the share of direct to indirect taxes is stronger for higher values of the *agricultural rate*. Beyond our model, in the second half of the diagram, where home production is reduced significantly and the capability of the state to impose more efficient forms of direct taxation rises, the effect on *direct/indirect* taxes becomes positive and statistically significant in the spirit of the Meltzer and Richard (1981) model.

[Insert Figure 3 here]

In Table C5 in Appendix C we report some additional robustness checks. First, panel A provides estimates of the long-run effect of democratisation using an ECM. Second, we rerun the estimates from Table 5 including additional control variables that have been proposed by the relevant literature (see, e.g., Aidt and Jensen, 2006; Aidt and Jensen, 2009b). Third, we re-estimate our baseline specification by the SURE model. Finally, we apply the Tobit estimator, since four of our dependent variables- *direct/indirect*, *urban taxes*, *rural taxes* and *market taxes* - are coded zero for some years of our sample. In all cases, our results are line to those reported in Table 5. For instance, the turning point for a positive effect of *democracy* on *direct/indirect taxation* is *agricultural rate* below 44 percent, whereas in Table C5 this value is very close ranging between 42.2 and 47 percent. Overall, these results are consistent with our hypothesis that the impact of franchise extension on the tax structure is conditional on the phase of economic development.

## 6. Discussion

A large number of scholars suggest that the main concern of the Greek governments during the first decades after independence was the legitimization of their authority (see e.g., Dertilis, 2015; Kostis, 2018). This could be achieved by ensuring a minimum level of social cohesion and by convincing the citizens of the newly established Greek state that public demand for equality is going to be satisfied. On this basis, a number of political and economic benefits were provided to low income agents from the very first day after Independence. However, after the constitution of 1864 that trnasformed the political regime to a *crowned democracy* with universal male suffrage a series of even more radical economic reforms took place.

According to Dertilis (2015, pp.769-772), the franchise reform of 1864 was accompanied by three fundamental economic reforms, all of which were in favour of the rural population. The first one was the distribution of the so-called *Public Lands* (that were lands belonged to Ottoman landowners and nationalized by the Greek State after Independence) to small peasants and landless sharecroppers in 1871. This reform was accompanied by a second land redistribution in 1924 of the large-land estates that were located mostly in Thessaly. The second reform was related to changes that took place during the 1860s in the functioning of the banking system and allowed rural population to gain access to low-cost credit from the banks. This low-cost credit was further increased after 1928 through the creation of the Agricultural Bank of Greece. Finally, the third radical economic reform was the restructuring of the tax system. As we have already noted, the tax burden on land (i.e., *dekati* and *epikarpia*) started to decline in 1845 and was then reduced more radically after 1864. The significant reduction in *rural taxes* was accompanied by remarkable increases in *indirect taxes*.

This paper places the spotlight on the third fundamental economic reform and investigates empirically whether the extension of voting franchise to all males above the age of 21, that took place in 1864, was the ultimate driving force behind the shift in the implemented tax policy. Building on a unique tax dataset that contains 13 different tax categories of Greek state during the period 1833-1933, our empirical analysis suggests that the Greek governments changed the structure of taxation in order to meet the preferences of the electorate, who was mostly constituted by peasants and farmers. This new political majority was obviously harmed significantly by *taxes on land* but -at the same time- it was able to escape *indirect taxes* through self-consumption. In turn, our analysis employs a sample of 12 Western European countries over the same period and provides evidence that the phase of economic development induced a differentiated effect of democratisation on the size and the structure of taxation also in Europe.

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Table 1. Tax revenues of the Greek state over 1833-1933

	<i>total taxes</i> (1)	<i>direct/indirect</i> (2)	<i>rural taxes</i> (3)	<i>urban taxes</i> (4)	<i>custom taxes</i> (5)	<i>market taxes</i> (6)
time range:						
1833-1844	14.98	2.13	65.87	1.74	24.54	7.85
1845-1864	11.29	1.48	56.69	2.33	27.21	13.77
1865-1879	10.89	0.78	38.51	5.04	41.19	15.26
1880-1915	13.99	0.31	16.77	6.76	38.83	37.64
1916-1933	17.70	0.41	9.74	18.66	32.63	38.97

**Notes:** Column titles refer to the tax variables as defined in Section 2.1; *time range* indicates the five sub-periods we split our sample. *Rural taxes*, *urban taxes*, *custom taxes* and *market taxes* are all expressed as a percentage of total taxes and therefore the summation of columns (3)-(6) always equals to 100.

Table 2. Fiscal effects of democratization in Greece

	<i>total taxes</i>	<i>direct/indirect</i>	<i>rural taxes</i>	<i>urban taxes</i>	<i>customs taxes</i>	<i>market taxes</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>democracy</i>	0.181 (0.652)	-0.138*** (0.050)	-5.138*** (1.667)	-1.491 (1.039)	5.729*** (1.698)	1.405 (1.106)
<i>lagged dependent variable</i>	0.821*** (0.068)	0.476*** (0.098)	0.423*** (0.108)	0.805*** (0.117)	0.606*** (0.078)	0.917*** (0.044)
<i>GDP per capita</i>	-0.188 (1.455)	0.464 (0.287)	3.809 (3.878)	0.156 (1.262)	-4.266 (3.323)	2.929 (2.089)
<i>agricultural rate</i>	-0.150 (0.154)	-0.024 (0.017)	-0.087 (0.374)	0.032 (0.227)	0.297 (0.368)	-0.213 (0.219)
<i>old</i>	0.466 (0.472)	0.121 (0.078)	1.069 (1.078)	1.090** (0.456)	0.392 (0.931)	-0.851 (0.655)
<i>population spikes</i>	-0.537 (0.638)	-0.023 (0.048)	-1.036 (0.970)	-1.304 (1.599)	3.186 (2.848)	-0.511 (1.424)
<i>debt crisis</i>	-0.968* (0.555)	0.023 (0.039)	3.051*** (1.033)	-0.411 (0.363)	-0.174 (1.117)	-0.484 (0.837)
<i>currency crisis</i>	-0.014 (0.737)	-0.201*** (0.041)	-2.469* (1.448)	-7.839*** (2.718)	6.466** (2.619)	4.221*** (1.318)
<i>internal instability</i>	-2.918*** (0.812)	-0.070 (0.060)	0.315 (1.261)	-1.591 (0.958)	-0.364 (1.884)	2.819* (1.493)
<i>wars</i>	-0.268 (0.551)	0.026 (0.045)	0.324 (1.354)	0.875 (0.622)	-1.689 (1.427)	-0.102 (0.896)
<i>Observations</i>	100	100	100	100	100	100
<i>R2</i>	0.897	0.921	0.976	0.926	0.789	0.975

Notes: Column titles refer to the dependent variable. The table reports OLS estimates of equation (19). All estimates include an intercept and a time trend, but these coefficients are not reported to save space. Robust standard errors are reported in parentheses. \*\*\* denotes significance at 1% level, \*\* denotes significance at 5% level and \* denotes significance at 10% level.

Table 3. Fiscal effects of democratization in Greece: Robustness checks

	<i>total taxes</i>	<i>direct/indirect</i>	<i>rural taxes</i>	<i>urban taxes</i>	<i>customs taxes</i>	<i>market taxes</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Restricting the set of covariates</b>						
<i>democracy</i>	0.725 (0.756)	-0.093* (0.053)	-3.748** (1.559)	1.046 (0.842)	4.866** (1.870)	-0.060 (1.121)
<i>Observations</i>	100	100	100	100	100	100
<i>R2</i>	0.870	0.918	0.974	0.886	0.763	0.971
<b>Panel B: Sample 1845-1915</b>						
<i>democracy</i>	-1.363 (1.090)	-0.295*** (0.105)	-10.603*** (2.795)	0.133 (0.325)	9.421** (4.204)	3.472 (2.780)
<i>Observations</i>	71	71	71	71	71	71
<i>R2</i>	0.755	0.899	0.964	0.947	0.780	0.973
<b>Panel C: Sample 1853-1879</b>						
<i>democracy</i>	2.083 (1.665)	-0.368 (0.255)	-12.227* (7.265)	0.111 (0.402)	13.838*** (4.391)	-0.059 (1.369)
<i>Observations</i>	27	27	27	27	27	27
<i>R2</i>	0.445	0.876	0.918	0.948	0.935	0.710

Notes: Column titles refer to the dependent variable. Panel A reports OLS estimates of equation (19) after restricting the set of controls. Panels B and C report OLS estimates of equation (19) for the subsamples 1844-1915 and 1853-1879, respectively. In Panel B we control for the *lagged dependent variable*, *GDP per capita*, *agricultural rate*, *old*, *population spikes*, *debt crisis*, *currency crisis*, *internal instability*, *wars*, an intercept and a time trend. Panels A and C exclude from this set the variables *debt crisis*, *currency crisis*, *internal instability*, *wars*. Additional covariates are not reported to save space. Robust standard errors are reported in parentheses. \*\*\* denotes significance at 1% level, \*\* denotes significance at 5% level and \* denotes significance at 10% level.

Table 4: Estimated changes on rural taxes capita between 1853-1879, after the reform of 1864

<i>Dependent variable:</i> "agricultural rate" variable:	<i>rural taxes</i>							<i>indirect taxes</i>	<i>rural taxes</i>
	<i>farmers and peasants 1861</i>				<i>landowners 1861</i>	<i>workers 1861</i>	<i>farmers and peasants 1861</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>democracy * agricultural rate</i>	-0.198*** (0.033)	-0.151*** (0.035)	-0.078* (0.039)			0.005 (0.090)	0.129 (0.146)	-0.005 (0.010)	0.376** (0.153)
$T_{1865,1868} * agricultural rate$				-0.093*** (0.031)					
$T_{1869,1872} * agricultural rate$				-0.072* (0.045)					
$T_{1873,1876} * agricultural rate$				-0.050 (0.049)					
$T_{1877,1879} * agricultural rate$				-0.097* (0.060)					
<i>trend</i>					-0.265*** (0.060)				
<i>trend * agricultural rate</i>					-0.002 (0.003)				
<i>democracy * voter turnout</i>									0.062* (0.032)
<i>democracy * agricultural rate * voter turnout</i>									-0.007*** (0.002)
<i>Province FE</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Year FE</i>	✓	✓	✓	✓		✓	✓	✓	✓
<i>Regional time trends</i>		✓	✓	✓		✓	✓	✓	✓
<i>Controls (<math>X_{it}</math>)</i>			✓	✓	✓	✓	✓	✓	✓
<i>R2</i>	0.590	0.637	0.697	0.699	0.570	0.691	0.692	0.296	0.707
<i>Observations</i>	1075	1075	1075	1075	387	1075	1075	1075	1075

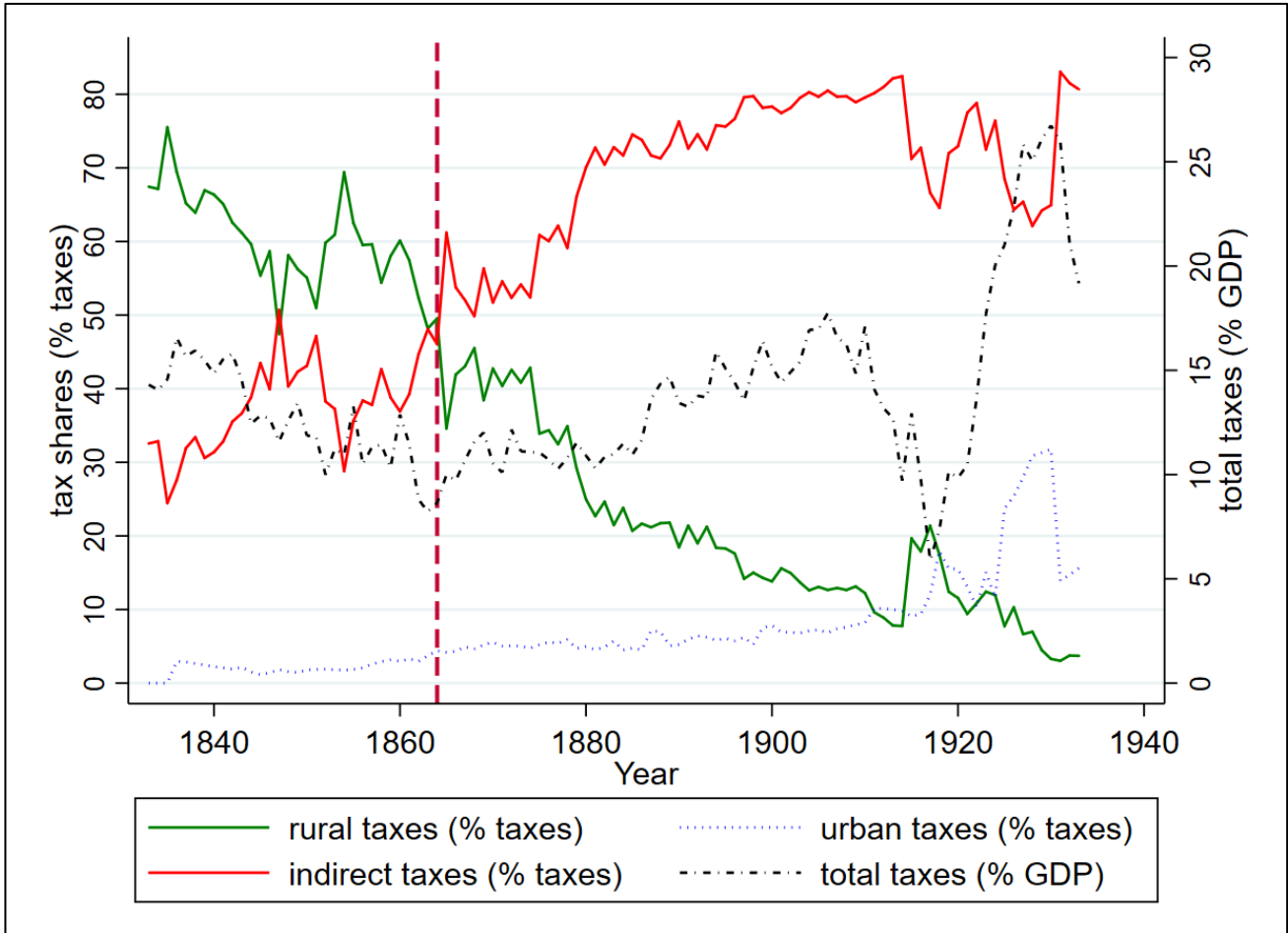
Notes: Columns (1)-(3) list the DD coefficient estimate of equation (20). Column (4) list the DD coefficients estimates of equation (21). Column (5) list selected results from equation (22), a pre-suffrage model of *rural taxes* and *agricultural rate*. Columns (6) and (7) list the DD coefficient estimate of equation (20) when the "agricultural rate" variable *farmers and peasants 1861* is replaced with the variables *landowners 1861* and *workers 1861*, respectively. Column (8) list the DD coefficient estimate of equation (20), when the dependent variable is *indirect taxes* instead of *rural taxes*. Column (9) list the main results of the DDD empirical specification of equation (23). Controls include *population*, *population squared*, *population density* and the percentage of delayed payments of the tax instrument. Standard errors clustered at the province-level are provided in parentheses. \*\*\* denotes significance at 1% level, \*\* denotes significance at 5% level and \* denotes significance at 10% level.

Table 5. Fiscal effects of democratization in Europe

<b>Panel A: Estimated coefficients</b>	<i>total taxes</i> (1)	<i>direct/indirect</i> (2)	<i>rural taxes</i> (3)	<i>urban taxes</i> (4)	<i>customs taxes</i> (5)	<i>market taxes</i> (6)
<i>democracy</i>	0.789*** (0.187)	0.533*** (0.148)	0.093 (0.390)	6.358*** (1.273)	-2.554*** (0.578)	-2.226* (1.106)
<i>democracy* agricultural rate</i>	-0.018*** (0.005)	-0.012*** (0.003)	-0.008 (0.013)	-0.104*** (0.025)	0.053*** (0.015)	0.036 (0.026)
<i>agricultural rate</i>	0.018 (0.014)	0.019** (0.007)	0.053 (0.043)	0.186** (0.061)	-0.142*** (0.045)	-0.059 (0.047)
<i>lagged dependent variable</i>	0.769*** (0.055)	0.228 (0.186)	0.913*** (0.031)	0.717*** (0.063)	0.837*** (0.037)	0.768*** (0.064)
<i>GDP per capita</i>	-2.983*** (0.821)	0.010 (0.209)	1.129 (1.528)	-0.089 (2.210)	-10.806*** (2.604)	11.188*** (2.641)
<i>old</i>	0.516*** (0.118)	-0.012 (0.030)	-0.103 (0.169)	0.164 (0.399)	-0.077 (0.358)	0.803 (0.496)
<i>population</i>	2.730* (1.409)	-0.209 (0.209)	-2.037** (0.831)	1.976 (1.918)	0.341 (3.740)	5.464 (3.161)
<i>debt crisis</i>	-0.267 (0.175)	0.195* (0.102)	0.176 (0.433)	0.093 (1.664)	-3.020 (2.183)	2.726 (2.727)
<i>currency crisis</i>	-0.021 (0.306)	0.005 (0.133)	-1.386 (1.369)	1.693 (1.435)	-1.971* (0.987)	1.367 (1.343)
<i>internal instability</i>	0.221 (0.352)	-0.416 (0.402)	-1.960*** (0.315)	-4.547 (3.666)	-2.418* (1.129)	0.716** (0.301)
<i>wars</i>	0.239** (0.080)	-0.016 (0.032)	0.177 (0.115)	-0.125 (0.449)	-0.682 (0.394)	0.928* (0.446)
<i>Observations</i>	413	654	657	660	654	654
<i>R2</i>	0.939	0.807	0.959	0.937	0.941	0.838
<b>Panel B: Estimated fiscal effects of democracy for different values of the agricultural rate</b>						
<i>agricultural rate = 23.22</i>	0.373* (0.176)	0.261*** (0.078)	-0.103 (0.182)	3.934*** (0.882)	-1.331*** (0.314)	-1.394** (0.614)
<i>agricultural rate = 38.32 (mean)</i>	0.102 (0.211)	0.083* (0.045)	-0.231 (0.226)	2.357*** (0.752)	-0.536* (0.281)	-0.852* (0.460)
<i>agricultural rate = 68.52</i>	-0.440 (0.334)	-0.271** (0.096)	-0.486 (0.563)	-0.797 (0.993)	1.054 (0.605)	0.231 (0.912)

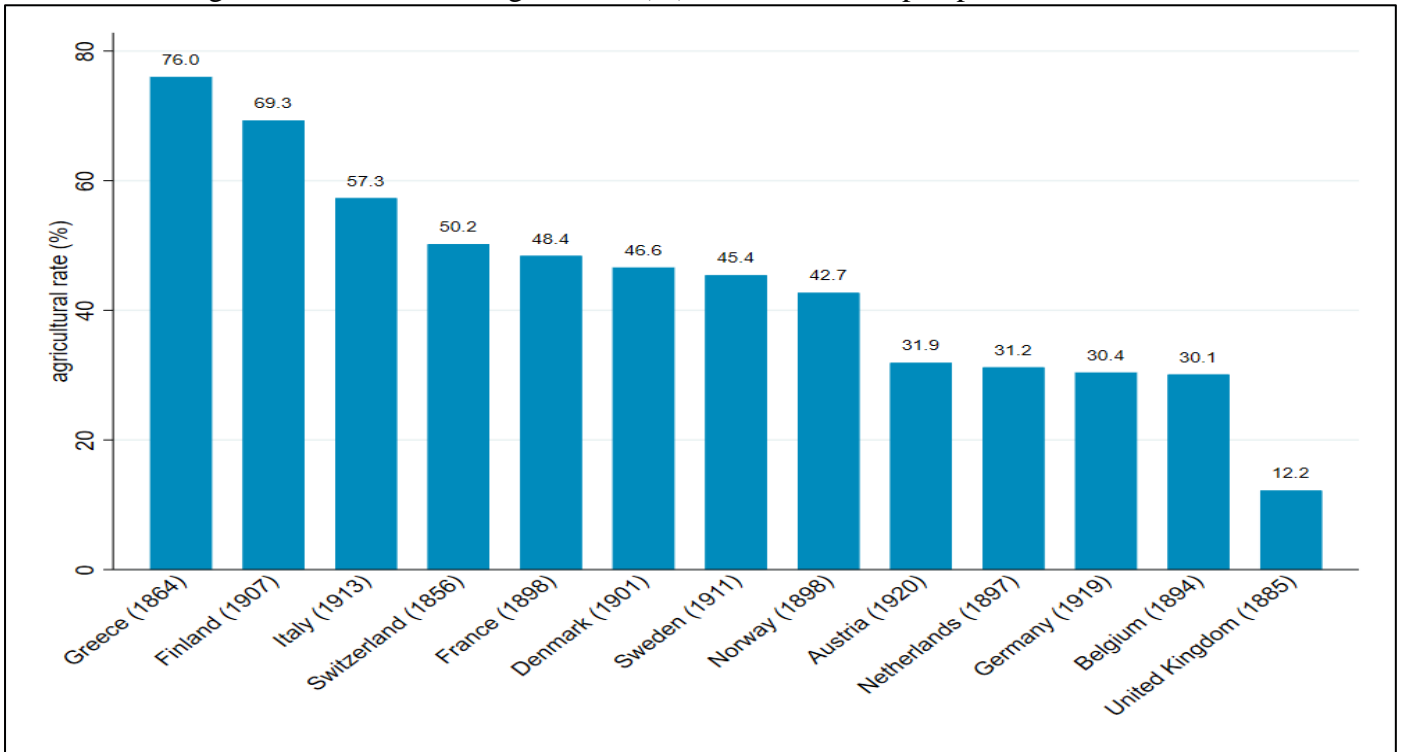
Notes: Panel A reports OLS estimates of equation (24). All estimates include a full set of country and year fixed effects. Robust standard errors, clustered by country are reported in parentheses. Panel B reports estimates of the derivative of the variable *agriculture rate* with respect to the variable *democracy* with controls set at the mean. \*\*\* denotes significance at 1% level, \*\* denotes significance at 5% level and \* denotes significance at 10% level.

Figure 1. Tax revenues of the Greek state over 1833-1933



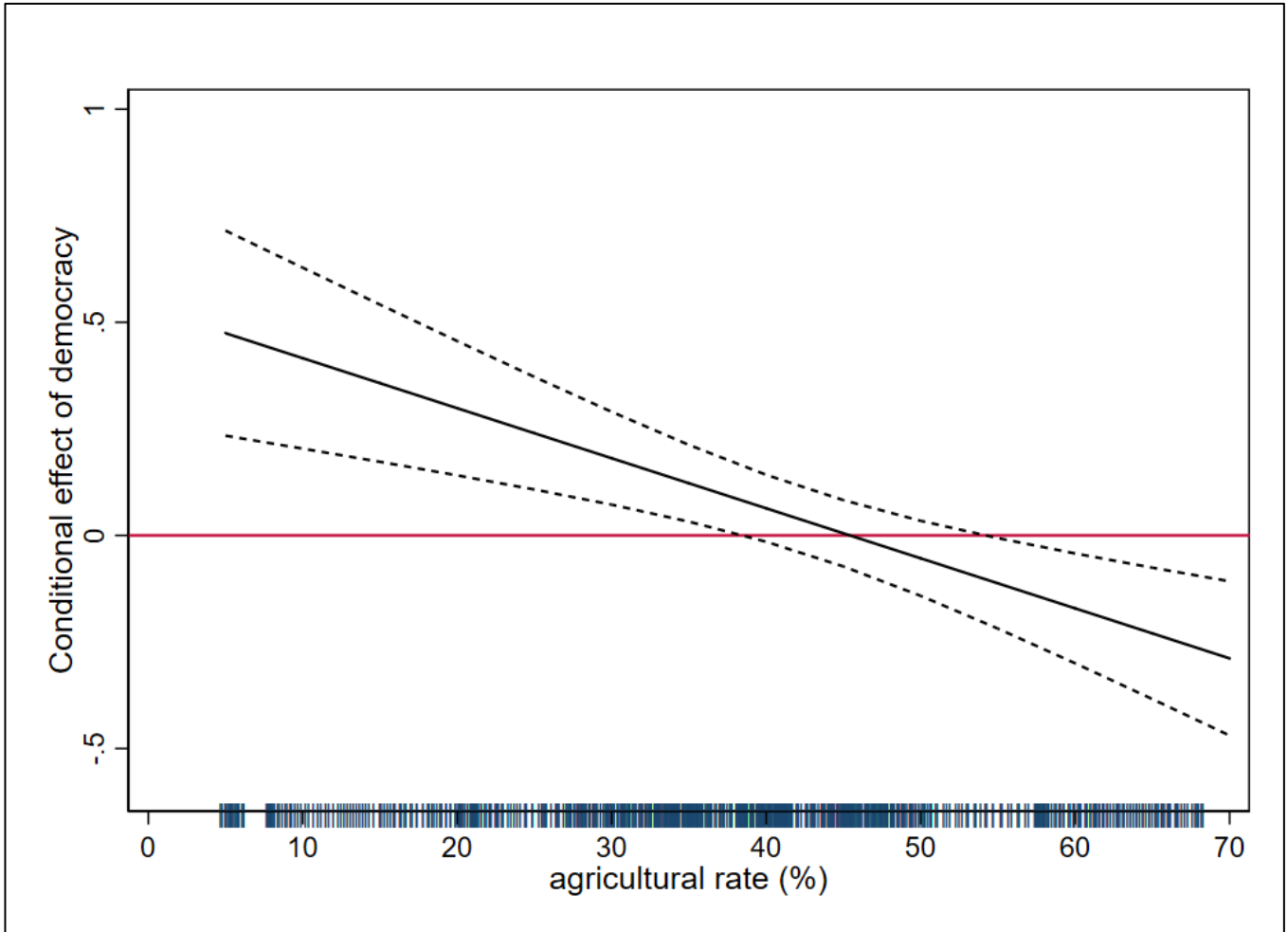
Notes: The graph shows the evolution of the level and composition of taxation in the Greek state over the period 1833-1933. The red dashed line indicates the year of the radical enfranchisement reform of 1864.

Figure 2. Workforce in Agriculture (%): Greece vs Europe upon democratisation



Notes: In the parenthesis, next to the country name, the year democratisation is reported. Source, Boix et al. (2013). For Greece, the variable workforce in agriculture (%) is obtained by Dertilis (1993). For all other European countries from Banks and Wilson (2015).

Figure 3. Conditional effect of democracy on direct/indirect (taxation)



Notes: This graph shows the conditional effects of *democracy* on the change in the share of *direct/indirect* taxation at different values of the *agricultural rate*; The conditional effects are calculated based on the specification (2) of Table 5; All other covariates are held constant at their means; Dashed lines signify 90% confidence intervals; Rug plot at horizontal axis illustrates distribution of agricultural rate in the sample; Red horizontal line marks marginal effect of 0.

## Appendix A. Tax Data for Greece

### A1. National tax database

Dertilis (1993, pp.105-297) was the first who attempted the development of a detailed historical tax database for Greece. After 10 years of personal research, he managed to track 89 fiscal accounts of the Greek state for the period 1833-1933. His research concluded with 12 missing accounts for the following years: 1850, 1851, 1856, 1857, 1863, 1907, and 1914-1919. Moreover, it should be noted that for the years 1845-1849, 1860, and 1867, Dertilis (1993, pp.105-297) employed data from provisional fiscal accounts (i.e., *Genikoi Logarismoι*), instead of final fiscal accounts (i.e., *Apologismoι*) of the Greek state, since the latter were missing.

In a subsequent period, Prontzas et al. (2011) managed to track all the remaining final fiscal accounts of the Greek state for the period under consideration, except for the year 1860. We tracked down the account for that year in the HANBG, where we also obtained regional fiscal statistics for the fiscal years 1853-1879. The newly tracked final fiscal accounts, were merged with those from the database of Dertilis (1993), who based on the methodology of Flora et al. (1983) divided taxes into 13 broad tax categories: (1) land tax, (2) assessed tax, (3) trade tax, (4) corporation tax, (5) income tax, (6) property tax, (7) inheritance tax, (8) extraordinary tax, (9) other direct tax, (10) customs tax, (11) excise tax, (12) turnover tax, and (13) other indirect tax. For more details about the classification of different types of taxes into the 13 broad tax categories, see Dertilis (1993), pp. 189-203.

### A2. A brief history of the evolution of taxation in Greece

Following the successful revolution against the Ottoman rule between 1821-1829, Greece won its independence in 1830. After the war the tax system of the new-born Greek state was modified, but some basic characteristics remained similar to those established by the Ottoman empire (see e.g., Shaw, 1975; McGowan, 1981).<sup>37</sup> The most basic component of *rural taxation*, the so-called *dekati*, which was a 10 percent tax on gross *agricultural* and *livestock* production, remained untouched. However, for specific types of agricultural goods (such as cotton, tobacco, and vines) Greek governments replaced *dekati* with the so-called *stremmatiki forologia*, which was based on the extent of the cultivated land (see Dertilis, 1993; Petmezas, 2003). On top of *dekati*, an additional 15 percent of the gross production was going to rents if the land was granted by the Greek state (the so-called *epikarpia*).<sup>38</sup> Moreover, if public lands were used without the permission of the Greek state, peasants were obliged to pay an additional 15 percent of

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<sup>37</sup> For instance, a large number of Ottoman lump sum taxes on peasants and farmers (such as *ispence* and *avariz*) were abolished.

<sup>38</sup> After independence, in practice, Greek authorities nationalized the great bulk of lands that belonged to Ottoman landowners. More precisely, although the Treaty of Constantinople had protected the land property rights of Ottoman individuals and institutions, in practice, Greek governments tolerated transactions and practices that were detrimental to these rights. Eventually, Greek authorities nationalized these lands as a temporary measure, but it took almost half century since independence before the official distribution of lands to the peasantry in 1871.

their gross production as *epikarpia*. Thus, the overall tax burden of the peasantry was ranging roughly between 25 to 40 percent. After the adoption of the constitution in 1844, a new tax law was voted in 1845. According to the new legislation, land rent paid for public lands (*epikarpia*) was reduced to a level of 10 percent, irrespective of whether public lands were used with or without permission. Therefore, the overall tax burden on land was decreased to a maximum of 20 percent of gross production. For this reason, as can be seen in Table 1, *total taxes* are reduced, whereas the percentage of *rural taxes* also drop from 65.87 percent the period 1833-1844, to 56.7 the years after the reform- and before the new constitution of 1864 was voted in.

After 1864, the tax rates of *dekati* and *stremmatiki forologia* fall significantly. It must be noted that during the same period there were also significant efforts from the Greek governments to fully abolish *dekati*, which finally took place in 1880.<sup>39</sup> Following similar political rationale, from 1880 until the first two decades of the 20<sup>th</sup> century, most of the Greek governments implemented tax reforms that were based on reductions of several direct taxes paid by the agricultural population (see e.g., Sideris, 1931), decreasing dramatically the level of *rural taxation* below 17 percent of total taxation.

The changes that took place between 1843 and 1880 were accompanied by remarkable increases in indirect taxes. Until 1884, most of these indirect taxes were basically *custom duties* on imported goods and *other indirect taxes* (e.g., stamp duty on legal documents). Then, in 1884, Prime Minister Charilaos Trikoupis implemented a tax reform that introduced a large number of excises duties - first introduced in 1880 - increasing at the same time revenues from state monopolies (see Kostis, 2006). As can be easily verified in columns (5) and (6) of Table 1, the summation of *custom taxes* and *market taxes* increased significantly in the years after the first big political reform in 1844, and even more rapidly after 1864. Changes in *rural taxes* and *indirect taxation* are also reflected on the evolution of the ratio *direct to indirect taxes* that decreases constantly during the whole period (see column (2) of Table 1).

Another basic characteristic of the Greek tax system was the full absence of personal income taxation until 1910. Investigating the composition of direct taxes from 1833 to 1910, several scholars have concluded that the amazing drop in *rural taxes* was accompanied by moderate increases, or introduction, of other forms of direct taxation that fell within the categories of *trade* or *corporate taxation* (see e.g., Dertilis, 1993). A good example is the introduction of the corporate tax rate in 1877, which contributed, on average, less than 0.5 percent of annual tax revenues. In 1911, Prime Minister Eleftherios Venizelos introduced the first modern personal income tax. However, its tax rate was flat and small and tax evasion so large that tax revenues from personal income taxation were insignificant until 1918. Its share exceeded

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<sup>39</sup> In 1860, Koumoundouros, the minister of finance of the Greek state, proposed a tax law, according to which *dekati* would be fully replaced by *stremmatiki forologia*. A similar reform was proposed by Sotiropoulos, a subsequent finance minister, in 1867. Both tax laws failed to become laws of the Greek state (see Sideris, 1931), since they were blocked mainly by the politically powerful group of *tax farmers* who were responsible for the monitoring and in some periods the collection of *rural taxes* (Kostis, 2006).

5 percent in 1919, and increased gradually thereafter. This is one of the reasons that *urban taxes* increased from 6.76 percent during the period of 1864-1915 to 18.66 percent on average the remaining years of our sample. As already mentioned, another important reason was the increase in *extraordinary and other direct taxes* due to the involvement of Greece in two wars between 1916-1933. This change also affected the overall level of *total taxes* that increased on average by almost by 4 percent of GDP after 1916 relative to the period 1880-1915.

### A3. Collection of rural taxes between 1853-1879

For each category of *rural taxes* the central government was budgeting the amount of taxes expected by each municipality. This amount was determined by the production capability of each municipality the tax rates set by the state, but also, and more importantly for our study, by the willingness of the state to collect taxes consistently within the Greek territory. The *land tax* in the Kingdom of Greece during 1853-1879 was collected in three different ways. The first and most important way of collecting the vast majority of the *land tax* (i.e., *dekati* and *epikarpia*), was through outsourcing its imposition and monitoring to private agents. According to this practice, rich members of notables were competing in public auctions - organised by the local authorities of each municipality in the capital city of the province - to impose and monitor the collection of expected taxes by the local population. Specifically, the winner had the right to impose tax burdens set by the state, subject to the production capability of each producer, and verify that tax payers submit the agreed payment on time in the public cashier of the municipality. The profit of the “tax farmer” from this process was to keep the residual tax revenues collected -above the determined *tax receivables* at the auction.<sup>40</sup> The “tax renter” was not allowed to collect revenues in cash or in-kind directly from the tax payer. Only after the agreed amount of taxes was gathered in the public cashier the authorities were compensating the “tax renter” with the residual tax collections.<sup>41</sup> Second, for some agricultural products (e.g., tobacco) taxes were levied according to the extent of the cultivated land (i.e., *stremmatiki forologia*). In particular, the producer had the duty to declare in the mayor the extent of his cultivated land. After that, employees of the local government had to verify the accuracy of this declaration, and inform the producer for the tax payment according to the tax rates set by the state. Third, for specific types of agricultural goods that were exported to international markets (mainly currants), it was collected in custom houses around

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<sup>40</sup> This is a variation of the so called “tax farming”, a tax collection scheme that was a global phenomenon until the 19th century, due to the absence of a fully developed tax bureaucracy (see, Webber and Wildavsky 1986). It can be tracked back in Ancient Greece and the Roman Republic and Empire (see, Adams, 1999). It reappeared in Byzantium and was also reborn in many European countries such as England and France in the Middle Ages as the dominant tax collection method (see, e.g., White, 2004; Johnson and Koyama, 2014). Tax farmers were financial intermediary for governments in the Ottoman Empire (see, Cizakca 1993; Salzman 1993), an institution inherited to the modern Greek state after its independence.

<sup>41</sup> The last two years of our sample a new law compelled the participants to submit an initial advance deposit after the auction followed by two more instalments during the fiscal year to cover the agreed payment. Tax farmers though had the right to collect the physical tax revenues and in turn to merchandise them with the aim of making a profit. This is the *rental contract* for a tax farm, under which the tax collectors would pay a fixed rent to the government for the right to collect a tax and keep the remaining revenue (see, e.g., Azabou and Nugent 1988; Stella 1993).

Greece -not in the *public cashier* of each province. This component of the *land tax* (~10 percent) cannot be included in the regional empirical analysis, since custom receipts of exported agricultural goods are reported only at the national level. The system of collection of *assessed taxes* on livestock production (the second component of *rural taxes*) is similar to the second method of collection of the *land tax* (i.e., *stremmatiki forologia*) meaning that local authorities were responsible to impose the tax burdens of the state to livestock production, and monitor the tax collection process.<sup>42</sup>

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<sup>42</sup> The authorities were publishing every year in the Government Gazzete, among others, laws about the tax policy (e.g., changes in tax rates) and the rules for the collection of taxes. With respect to the *land tax* important information for its collection can be found on issues published on April 25, 1848 (vol. 13), April 15, 1855 (vol. 13), June 26, 1863 (vol. 24) and January 3, 1878 (vol. 1) all available in the following link: <http://www.et.gr/index.php/anazitisi-fek>

## Appendix B: The solution of the model and comparative statics

**Proposition 1.** For given levels of  $g$ , a decrease in the median productivity  $e^m$  of the electorate, increases  $q_C$  and decreases  $q_H$ . Therefore, the extension of the voting franchise to the poorer segments of the population -that implies a lower level of  $e^m$  for those with the right to vote- exerts a negative impact on the share of direct to indirect taxes ( $\frac{q_H}{q_C}$ ).

### Proof

Agents have intermediate preferences and consequently a Condorcet winner always exists and is given by the bliss point of the median voter (i.e., the agent with the median productivity  $e^m$ ) (see e.g., Grandmont, 1978 for more details on this). The indirect utility function of the median voter is as follows:

$$W^m(q_C, q_H) = \frac{\theta A_M}{1 + q_C} (e_m - \bar{e}) + \theta A_M L(q_C, q_H) + V(X(q_C)) + (1 - \theta) q_H A_H (H(q_C, q_H))$$

So, the political equilibrium is given by the following equation:

$$\frac{\partial W^m}{\partial q_C} = \frac{-\theta A_M (e_m - \bar{e})}{(1 + q_C)^2} + \theta A_M \frac{\partial L(q_C, q_H)}{\partial q_C} + \frac{\partial V}{\partial X} \frac{\partial X(q_C)}{\partial q_C} + (1 - \theta) A_H q_C \frac{\partial H(q_C, q_H)}{\partial q_C} = 0 \quad (\text{A.1})$$

$$\frac{\partial W^m}{\partial q_H} = \theta A_M \frac{\partial L(q_C, q_H)}{\partial q_H} + (1 - \theta) A_H H(q_C, q_H) + (1 - \theta) q_H A_H \frac{\partial H(q_C, q_H)}{\partial q_H} = 0 \quad (\text{A.2})$$

More precisely, equations (A.1), (A.2) determine -for given level of  $g$ - the consumption tax ( $q_C$ ) and the home production tax ( $q_H$ ) as functions of median productivity ( $e_m$ ), mean productivity ( $\bar{e}$ ) and the parameter values  $\theta$ ,  $A_M$  and  $A_H$ .

Subtracting (A.2) from (A.1) we can define  $F(q_C, q_H, e_m)$  as follows:

$$F(q_C, q_H, e_m) = \frac{-\theta A_M (e_m - \bar{e})}{(1 + q_C)^2} + \theta A_M \left[ \frac{\partial L(q_C, q_H)}{\partial q_C} - \frac{\partial L(q_C, q_H)}{\partial q_H} \right] + (1 - \theta) A_H \left[ q_C \frac{\partial H(q_C, q_H)}{\partial q_C} - q_H \frac{\partial H(q_C, q_H)}{\partial q_H} \right] + \frac{\partial V}{\partial X} \frac{\partial X(q_C)}{\partial q_C} - (1 - \theta) A_H H(q_C, q_H) = 0$$

In turn, by employing the implicit function theorem it can be established that the effect of median productivity on consumption tax ( $q_C$ ) is as follows:

$$\frac{\partial q_C}{\partial e_m} = -\frac{F e_m}{F q_C} = \frac{\theta A_M}{(1+q_C)^2} \frac{(1+q_C)}{2\theta A_M (e_m - \bar{e})} = \frac{1}{2(1+q_C)(e_m - \bar{e})} \quad (\text{A.3})$$

It can be easily verified that (A.3) is negative for any typical right skewed productivity distribution (i.e. for  $e_m < \bar{e}$ ).

Similarly, the effect of median productivity on home production tax ( $q_H$ ) is as follows:

$$\frac{\partial q_H}{\partial e_m} = -\frac{F e_m}{F q_H} = \frac{2\theta A_M (\theta - 1) A_H (\partial H(q_C, q_H) / \partial q_H)}{(1+q_C)^2} \quad (\text{A.4})$$

Obviously (A.4) is always positive. Combining the above mentioned results we conclude that a decrease in the median productivity  $e^m$  increases consumption tax ( $q_C$ ) and decreases home production tax ( $q_H$ ) and so exerts a clear cut negative impact on the share of direct to indirect taxes ( $\frac{q_H}{q_C}$ ).

**Proposition 2.** *The positive effect of changing median productivity  $e^m$  on the share of direct to indirect taxes ( $\frac{q_H}{q_C}$ ) is conditional on the size of  $\theta$  (i.e., the level of economic development). In particular, for lower values of  $\theta$  the positive effect of changing median productivity on the share of direct to indirect taxes is stronger.*

### **Proof**

Equation (A.3) suggests that the effect of changing median productivity  $e^m$  on consumption tax ( $q_C$ ) is negative -for any typical right skewed productivity distribution- and independent of the level of economic development (i.e. the level of  $\theta$ ). On the other hand, equation (A.4) suggests that the effect of changing median productivity on home production tax ( $q_H$ ) is always positive but dependent on the level of economic development (i.e. the level of  $\theta$ ). More precisely, by taking the second order derivative with respect to  $\theta$  we get:

$$\frac{\partial^2 q_H}{\partial e_m \partial \theta} = \frac{2(2\theta - 1) A_M A_H (\partial H(q_C, q_H) / \partial q_H)}{(1+q_C)^2} \quad (\text{A.5})$$

It can be easily verified that (A.5) is positive when  $0 < \theta < 1/2$  (and negative when  $1/2 < \theta < 1$ ).

So, the positive effect of changing median productivity  $e^m$  on home production tax ( $q_H$ ) is stronger for lower values of  $\theta$  and becomes weaker as  $\theta$  increases. Since, on the other hand, the negative effect of changing median productivity  $e^m$  on consumption tax ( $q_C$ ) does not depend on  $\theta$ , we can easily conclude that the positive effect of changing median productivity on the share of direct to indirect taxes ( $\frac{q_H}{q_C}$ ) is stronger for lower values of  $\theta$  and becomes weaker as  $\theta$  increases.

## Appendix C. Additional Tables and Figures

Table C1: Summary statistics of Greek national data

Variable	Description	Obs.	Mean	SD	Min	Max	Source
<i>democracy</i>	Dummy variable that takes the value of one whenever the political regime in Greece is categorised as democratic, and 0 otherwise	101	0.574	0.497	0.000	1.000	1
<i>polity2</i>	Index variable that ranges -10 (extreme autocracy) to +10 (perfect democracy)	101	4.515	6.162	-6.000	10.000	2
<i>total taxes</i>	Total tax revenues as a share of GDP (%)	101	13.773	4.072	5.900	26.743	3
<i>rural taxes</i>	Sum of land and assessed taxes as a share of total tax revenues (%)	101	32.485	21.501	3.035	75.518	4
<i>urban taxes</i>	Sum of income, trade, corporation, property, inheritance, extraordinary and other direct taxes as a share of total tax revenues (%)	101	7.151	6.631	0.000	31.769	4
<i>customs taxes</i>	Customs duties on imported goods as a share of total tax revenues (%)	101	34.078	7.766	17.618	55.150	4
<i>market taxes</i>	Sum of excise, turnover, and other indirect taxes as a share of total tax revenues (%)	101	26.286	13.895	2.495	47.000	4
<i>direct/indirect</i>	Ratio of direct taxes -rural and urban taxes- to indirect taxes -customs and market taxes.	101	0.846	0.680	0.204	3.085	4
<i>GDP per capita</i>	Log of GDP per capita	101	5.435	0.164	5.040	5.847	5
<i>agricultural rate</i>	Population within Greece living in cities of less than two thousand people (%)	101	70.440	6.301	56.500	80.000	6
<i>old</i>	Population over the age of 65 as a share of total population (%)	101	3.919	0.918	3.058	5.905	7
<i>population spikes</i>	Dummy variable that takes the value of 1 in the years 1864, 1881, 1913, 1920 and 1922, and 0 otherwise.	101	0.050	0.218	0.000	1.000	Own calculations
<i>debt crisis</i>	Dummy variable that takes the value of 1 the years 1833-1878, 1894-1897 and 1932-1933, and 0 otherwise.	101	0.515	0.502	0.000	1.000	8
<i>currency crisis</i>	Dummy variable that takes the value of 1 the years 1919-1921, 1924 and 1931, and 0 otherwise.	101	0.050	0.218	0.000	1.000	8
<i>internal instability</i>	Dummy variable that takes the value of 1 the years 1843, 1862, 1909 and 1916-1917, and 0 otherwise.	101	0.050	0.218	0.000	1.000	Own calculations
<i>wars</i>	Dummy variable that takes the value of 1 during the years 1866-1869, 1878, 1897, 1912-1913 and 1917-1922, and 0 otherwise.	101	0.139	0.347	0.000	1.000	Own calculations

Source:

1. Boix et al. (2013)
2. Marshall and Jagers (2010)
3. Own calculations based on fiscal data retrieved from Dertilis (1993), Prontzas et al. (2011) and Historical Archives of the National Bank of Greece (DPH). GDP data are taken from and Kostelenos et al. (2007)
4. Own calculations based on fiscal data retrieved from DPH
5. Kostelenos et al. (2007)
6. Dertilis (1993)
7. Siampos (1973)
8. Reinhart and Rogoff (2010)

Table C2: Summary statistics of Greek regional data

Variable	Description	Obs.	Mean	SD	Min	Max	Source
<i>democracy</i>	Dummy variable that takes the value of one after 1865, and 0 otherwise	1075	0.600	0.490	0.000	1.000	1
<i>rural taxes</i>	Sum of land and assessed taxes, expressed in real per capital terms	1075	6.134	4.627	0.000	29.681	2
<i>indirect taxes</i>	Stamp duties, and various other rights, expressed in real per capita terms	1075	1.571	1.370	0.000	11.724	2
<i>rural taxes delays</i>	Rural taxes delays as a percentage of rural taxes receivables	1075	13.109	11.893	0.000	74.592	3
<i>indirect taxes delays</i>	Indirect taxes delays as a percentage of indirect taxes receivables	1075	1.761	4.174	-0.190	89.264	3
<i>farmers and peasants 1861</i>	Farmers and peasants as a percentage of the total province population in 1861	1075	17.078	6.879	2.837	28.426	4
<i>landowners 1861</i>	Landowners as a percentage of the total province population in 1861	1075	1.564	1.852	0.112	11.476	4
<i>workers 1861</i>	Workers as a percentage of the total province population in 1861	1075	1.766	1.693	0.000	7.478	4
<i>voter turnout</i>	Voters as a percentage of the enfranchised in 1879	1075	65.724	13.288	31.000	88.000	4
<i>population (in thousands)</i>	Total province population for the years 1853, 1861, 1870 and 1879. We obtain the remaining years by linear interpolation	1075	27716.9	15220.3	8377.0	1.23e+05	4
<i>population density</i>	Total province population per unit of province area.	1075	30.769	21.985	8.669	149.777	4

Source:

1. Boix et al. (2013)
2. Own calculations based on fiscal data retrieved from the Historical Archives of the National Bank of Greece (HANBG), and census data from the Hellenic Statistical Association (HSA). To express the variable real terms we use data for changes in the price level from Lazaretou (2014).
3. Own calculations based on fiscal data retrieved from the Historical Archives of the National Bank of Greece (HANBG)
4. Own calculations based on census data obtained from Hellenic Statistical Authority (HSA)

Table C3: Summary statistics of European sample

Variable	Description	Obs.	Mean	SD	Min	Max	Source
<i>democracy</i>	Dummy variable that equals to one whenever a political regime is characterized as democratic and 0 otherwise	670	0.485	0.500	0.000	1.000	1
<i>total taxes</i>	Total tax revenues as a percentage of GDP	425	7.284	3.713	1.300	20.500	2
<i>rural taxes</i>	Sum of land and assessed taxes as a percentage of total tax revenues	668	9.032	9.605	0.000	33.800	2
<i>urban taxes</i>	Sum of income, trade, corporation, property, inheritance, extraordinary and other direct taxes as a percentage of total tax revenues	670	18.641	14.803	0.000	73.500	2
<i>customs taxes</i>	Customs taxes as a percentage of total tax revenues	670	30.859	23.915	4.200	96.400	2
<i>market taxes</i>	Sum of excise, turnover, and other indirect taxes as a percentage of total tax revenues	670	41.479	16.060	0.000	73.900	2
<i>direct/indirect</i>	Ratio of direct taxes -rural and urban taxes- to indirect taxes -customs and market taxes.	670	0.452	0.362	0.000	2.774	2
<i>GDP per capita</i>	Log of GDP per capita	670	7.935	0.363	6.997	8.753	3
<i>agricultural rate</i>	Percentage of workforce occupied in agriculture	670	38.318	15.101	5.700	69.300	4
<i>old</i>	Population over the age of 65 as a percentage of total population	670	6.392	1.255	3.465	9.745	5
<i>population</i>	Log of population	670	9.247	1.161	7.512	11.098	3
<i>debt crisis</i>	Dummy variable that takes the value of 1 if a debt (domestic or external) crisis occurred during the year, and 0 otherwise	670	0.009	0.094	0.000	1.000	6
<i>currency crisis</i>	Dummy variable that takes the value of 1 if a currency crisis occurred during the year, and 0 otherwise	670	0.033	0.178	0.000	1.000	6
<i>internal instability</i>	Dummy variable that takes the value of 1 if a revolutionary event took place in a given year, and 0 otherwise	670	0.052	0.223	0.000	1.000	7
<i>wars</i>	Dummy variable that takes the value of 1 if a country participated in an armed conflict with another country in a given year, and 0 otherwise	670	0.373	0.484	0.000	1.000	8
<i>voting system</i>	A dummy variable equal to 0 if majority representation is used and equal to 1 if proportional representation is used	660	0.209	0.407	0.000	1.000	9
<i>left</i>	Share of seats won by left-wing parties in elections to the lower chamber of parliament in percentage of all seats	637	10.262	14.666	0.000	55.400	9
<i>x-polity</i>	Polity index without competitiveness of political participation (PARCOMP), and regulation of political participation (PARREG)	670	5.590	1.771	0.000	7.000	10

Source:

1. Boix et al. (2013)
2. Flora et al. (1983)
3. Bolt and van Zanden (2014)
4. Banks and Wilson (2015)
5. Mitchell (2003)
6. Reinhart and Rogoff (2010)
7. Aidt and Jensen (2014)
8. Brecke (1999)
9. Aidt et al. (2008)
10. Marshall and Jagers (2010)

Table C4. Fiscal effects of democratization in Greece: Additional robustness checks

	<i>total taxes</i> (1)	<i>direct/indirect</i> (2)	<i>rural taxes</i> (3)	<i>urban taxes</i> (4)	<i>customs taxes</i> (5)	<i>market taxes</i> (6)
<b>Panel A: ECM – Long-run effect</b>						
<i>democracy</i>	-2.503 (6.551)	-0.242** (0.110)	-8.391*** (2.215)	-14.043 (17.910)	13.320*** (3.693)	-2.503 (6.551)
<i>Observations</i>	100	100	100	100	100	100
<i>R2</i>	0.346	0.327	0.388	0.543	0.673	0.645
<b>Panel B: Using alternative measure of democracy</b>						
<i>polity2</i>	-0.002 (0.057)	-0.011** (0.005)	-0.425*** (0.160)	-0.160 (0.118)	0.410*** (0.136)	0.161* (0.086)
<i>Observations</i>	100	100	100	100	100	100
<i>R2</i>	0.897	0.920	0.975	0.926	0.777	0.975
<b>Panel C: Testing for outliers</b>						
<i>democracy</i>	0.430 (0.499)	-0.115*** (0.037)	-4.227*** (1.514)	-1.529** (0.611)	4.745*** (1.384)	1.121 (0.871)
<i>Observations</i>	93	95	96	95	94	94
<i>R2</i>	0.930	0.970	0.985	0.983	0.854	0.983
<b>Panel D: SURE</b>						
<i>democracy</i>	-0.122 (0.618)	-0.121* (0.072)	-3.534*** (1.285)	-1.497* (0.814)	4.525*** (1.413)	0.595 (0.891)
<i>Observations</i>	100	100	100	100	100	100
<i>R2</i>	0.896	0.917	0.974	0.925	0.782	0.974

Notes: Column titles refer to the dependent variable. Panel A reports OLS estimates after transforming equation (19) to an ECM. Panel B reports OLS estimates of equation (19) after replacing the variable *democracy* with the variable *polity2*. Panel C list coefficient estimates of equation (19) after removing observations with standardized residuals above 1.96 or below -1.96. Panel D lists a complete system of SURE estimates. All models control for the *lagged dependent variable*, *GDP per capita*, *agricultural rate*, *old*, *population spikes*, *debt crisis*, *currency crisis*, *internal instability*, *wars*, an intercept and a time trend, but these coefficients are not reported to save space. Panels A, B and C report robust standard errors in parentheses. \*\*\* denotes significance at 1% level, \*\* denotes significance at 5% level and \* denotes significance at 10% level.

Table C5. Fiscal effects of democratization in Europe: robustness checks

	<i>total taxes</i>	<i>direct/indirect</i>	<i>rural taxes</i>	<i>urban taxes</i>	<i>customs taxes</i>	<i>market taxes</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: ECM – Long-run effect</b>						
<i>democracy</i>	1.701** (0.704)	0.764*** (0.120)	4.209 (3.146)	26.049*** (3.963)	-20.495*** (3.582)	-11.151*** (4.046)
<i>democracy* agricultural rate</i>	-0.043** (0.018)	-0.016*** (0.002)	-0.167* (0.087)	-0.435*** (0.082)	0.415*** (0.109)	0.189* (0.104)
<i>agricultural rate</i>	0.157*** (0.051)	0.024*** (0.006)	0.123 (0.119)	0.900*** (0.251)	-0.791*** (0.207)	-0.256 (0.204)
<i>Observations</i>	393	639	639	639	639	639
<i>R2</i>	0.509	0.489	0.250	0.372	0.254	0.287
<b>Panel B: Additional controls</b>						
<i>democracy</i>	0.587* (0.269)	0.252*** (0.062)	0.074 (0.345)	5.060*** (1.097)	-1.859** (0.682)	-2.408 (1.441)
<i>democracy* agricultural rate</i>	-0.018** (0.006)	-0.006*** (0.001)	-0.006 (0.011)	-0.086*** (0.022)	0.040* (0.019)	0.038 (0.030)
<i>agricultural rate</i>	0.015 (0.012)	0.008*** (0.002)	0.048 (0.035)	0.165** (0.064)	-0.132** (0.054)	-0.040 (0.045)
<i>Observations</i>	386	620	623	626	620	620
<i>R2</i>	0.943	0.895	0.959	0.944	0.947	0.844
<b>Panel C: SURE</b>						
<i>democracy</i>	0.755** (0.300)	0.263*** (0.049)	0.157 (0.333)	4.041*** (1.292)	-1.073 (1.123)	-3.130*** (1.183)
<i>democracy* agricultural rate</i>	-0.018** (0.008)	-0.006*** (0.001)	-0.004 (0.009)	-0.082** (0.034)	0.018 (0.029)	0.072** (0.031)
<i>agricultural rate</i>	0.021 (0.014)	0.005** (0.002)	0.007 (0.016)	0.115* (0.059)	-0.086 (0.053)	-0.047 (0.055)
<i>Observations</i>	466	466	466	466	466	466
<i>R2</i>	0.982	0.939	0.988	0.972	0.985	0.957
<b>Panel D: Tobit estimates</b>						
<i>democracy</i>	0.789*** (0.166)	0.526*** (0.140)	0.467 (0.335)	5.863*** (1.320)	-2.554*** (0.534)	-1.971* (1.008)
<i>democracy* agricultural rate</i>	-0.018*** (0.005)	-0.011*** (0.003)	-0.016 (0.013)	-0.093*** (0.029)	0.053*** (0.014)	0.024 (0.028)
<i>agricultural rate</i>	0.018 (0.013)	0.019*** (0.006)	0.063 (0.058)	0.195*** (0.059)	-0.142*** (0.042)	-0.065 (0.042)
<i>Observations</i>	413	654	657	660	654	654

**Notes:** Column titles refer to the dependent variable. Panel A reports OLS estimates after transforming equation (24) to an ECM. In Panel B equation (24) is augmented with additional controls: *voting system*, *left* and *x-polity*, but these coefficients are not reported to save space. Panel C lists a complete system of SURE estimates. Panel D reports Tobit model regressions of equation (24). All models control for the lagged dependent variable, *GDP per capita*, *agricultural rate*, *old*, *population*, *debt crisis*, *currency crisis*, *internal instability*, *wars*, but these coefficients are not reported to save space. Panels A, B and D report robust standard errors, clustered by country, in parentheses. \*\*\* denotes significance at 1% level, \*\* denotes significance at 5% level and \* denotes significance at 10% level.

Figure C1: Ballot box after the reform of 1864



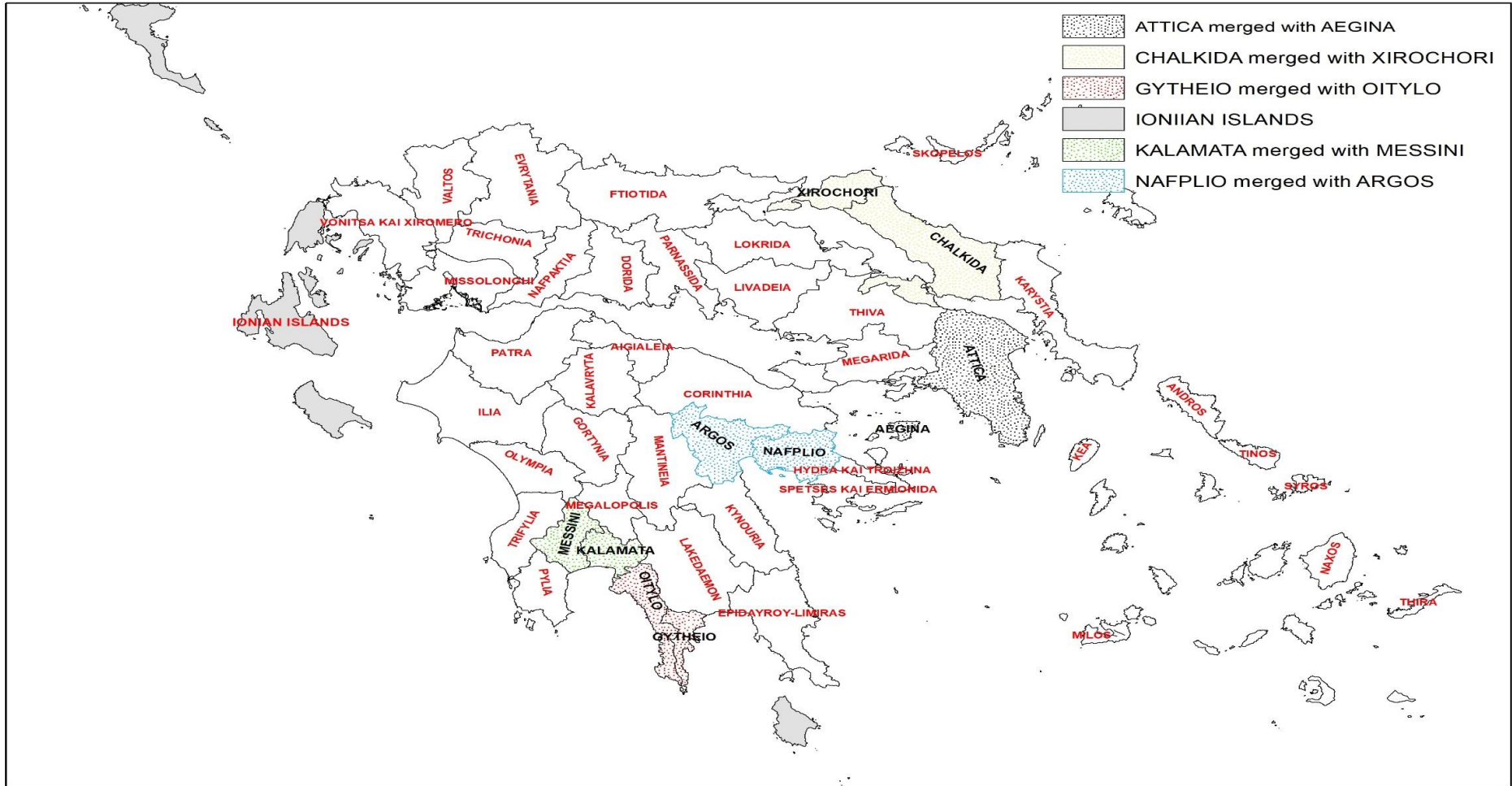
**Notes:** Images for the ballot box used after the reform of 1864. The ballot box was divided internally into two parts in which there were two sacks. As can be seen, the outside of each box was painted half white and half black, corresponding to a positive vote (i.e., NAI) or no vote (i.e., OCHI) for the candidate. At the top of the ballot box it was stuck a tube angle from top to bottom inside the ballot box, resulting in a round hole. The elector was given a lead ball by the attendant (a member of the Election Committee) at each box, and approaching the ballot box he had to put his hand into the tube dropping the pellet into the desired compartment - i.e., black or white. In each polling station there was a number of ballot boxes equal to that of candidates standing for elections in the province. Source: Internet (<https://www.sansimera.gr/>)

Figure C2: The *land tax* as reported in the fiscal accounts of the Greek state in 1863

14		ΥΠΟΥΡΓΕΙΟΝ ΟΙΚΟΝΟΜΙΚΩΝ.				ΓΕΝΙΚΟΣ								
Αναλυτικώς πάλι τῶν εσόδων τῆς γῆρας 1863														
Ταμεία	Κεφάλαιον Α'. Ἀθήναι Α'. Ἐγγίσι φέροι καὶ ἀπολύματα ἀποκαταξ													
	Εἰσπρακτέα			Εἰσπραχθέντα										
	Βασικαθίματα		Τὸ ὅλον	Κατὰ τὸ 1863		Κατὰ τὸ 1864		Τὸ ὅλον	Καθυστερούμενα τῶν 31 ἡμερῶν 1864					
	Κατὰ τὸ 1863	Κατὰ τὸ 1864												
1 Κεντρικόν	114,394	78	45,338	41	150,043	49	73,893	10	35,212	71	109,075	83	47,907	36
2 Παρισι	163,376	43	59,636	97	203,013	40	98,830	74	67,036	24	165,966	98	37,016	42
3 Ἰθακῆς	93,365	38	16,479	51	109,843	89	76,333	04	29,981	69	106,316	73	33,397	16
4 Ναυπλίου	138,408	42	32,035	70	170,443	92	100,716	50	48,303	34	159,019	87	45,443	05
5 Κορινθίας	287,442	95	36,619	99	324,062	94	206,392	75	72,695	80	279,088	55	44,973	39
6 Λακεδαιμόνιος	109,560	27	109,686	02	219,246	29	39,475	59	124,133	73	163,329	63	66,286	26
7 Καλαμίας	92,165	72	128,481	72	220,647	44	43,769	87	84,314	28	97,947	15	132,736	20
8 Μεσσηνίας	92,292	34	223,537	98	322,830	52	97,445	86	103,671	86	204,689	72	121,710	80
9 Φθιώτιδος	205,771	63	55,982	88	260,853	91	170,950	18	81,324	23	255,274	44	5,284	50
10 Ξάνθου	17,292	02	.....	..	17,292	02	7,897	27	6,654	18	14,351	45	2,744	47
11 Θυρίδος	202,971	74	7,342	80	210,313	60	146,620	33	52,985	43	199,605	46	40,709	14
12 Δελφίνων	108,866	04	59,497	34	168,363	35	89,696	73	64,159	62	153,766	35	5,337	..
13 Παρνασσίων	86,988	99	28,991	99	115,979	98	57,347	22	52,337	29	109,834	51	5,226	47
14 Χαλκίδος	174,631	48	42,654	05	217,285	53	150,988	50	54,537	12	185,645	62	2,639	91
15 Μενελάων	87,959	09	7,289	18	95,248	87	61,328	64	39,766	35	92,294	99	3,653	88
16 Βοιωτίας	49,433	88	46,485	..	95,918	88	47,761	92	43,826	58	32,591	50	34,791	38
17 Φύρας	42,531	81	165,292	94	207,823	75	9,977	47	70,899	43	85,886	60	94,926	15
18 Καλαβρύτων	58,429	22	107,967	19	166,396	41	34,999	33	69,869	27	104,868	45	60,627	96
19 Τριφυλίας	47,359	45	172,769	61	220,128	76	4,411	24	46,365	47	56,416	68	170,945	68
20 Πύλων	20,293	33	32,684	93	52,978	26	14,567	..	80,090	65	31,637	65	20,790	64
21 Ἐπιδαύρου Ἀργολίδος	25,542	42	59,978	44	85,520	27	12,386	65	36,652	57	49,228	62	35,334	63
22 Αργολίδος	205,698	37	29,977	13	235,675	50	229,459	28	28,634	03	297,789	31	6,296	19
23 Βοιωτίας	16,851	92	25,978	79	42,830	72	46,993	45	48,618	01	34,711	46	8,419	26
24 Τριφυλίας	44,907	36	37,712	42	82,619	78	32,976	52	30,443	79	69,449	31	43,580	47
25 Δαρδανίου	39,244	84	46,866	61	86,110	42	32,369	42	43,890	07	78,229	99	7,648	43
26 Μεγαλοασίας	19,932	72	188,302	68	208,234	89	43,445	44	96,297	91	109,373	05	28,941	76
27 Ὀλυμπίων	51,572	70	109,805	91	161,378	61	4,849	74	65,478	96	67,628	64	94,349	97
28 Θίρας	17,879	35	36,818	65	54,698	..	13,572	79	33,893	91	55,366	61	9,333	39
29 Αἰγιαλίων	68,396	43	4,437	52	72,833	95	29,462	67	34,271	99	63,414	66	9,439	29
30 Κασσώπης	97,914	38	612	89	97,527	27	35,444	94	56,649	01	92,661	95	5,593	32
31 Κερκυραίων	76,668	85	28,827	69	105,496	45	59,796	38	38,483	90	98,496	28	7,366	17
32 Νάξου	48,406	18	47,969	23	96,375	41	67,940	43	24,417	11	61,937	54	3,937	87
33 Σαλαμίνος	46,473	40	44,808	98	91,282	08	12,657	27	41,598	35	23,575	62	7,296	46
34 Ἰθίων	30,869	25	2,519	16	33,388	41	17,492	53	14,865	40	31,557	98	4,830	33
35 Μεγαρίδος	58,681	92	22,725	75	81,407	67	33,618	59	28,996	78	64,497	28	20,399	39
36 Τήρων	41,692	53	3,435	34	45,127	89	11,128	42	4,982	73	43,140	69	4,637	64
37 Ἄρδων	22,649	01	3,436	93	26,085	94	43,568	52	41,465	24	24,733	76	4,322	18
38 Σαλαμίνος	43,449	44	4,522	48	47,971	32	6,335	09	44,281	44	47,636	59	204	82
39 Ναυμαχίας	8,374	89	35,956	44	44,330	33	7,794	44	24,360	20	32,450	31	42,368	02
40 Μήδων	20,299	41	.....	..	20,299	41	42,363	68	7,435	59	19,399	27	900	14
41 Κίως	18,254	69	9,484	77	27,738	37	7,116	96	16,693	62	23,780	28	3,653	79
42 Γαβρίας	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
43 Βύρων	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
44 Εὐβοίας / Τάλαντος	1,262,367	56	226,697	64	1,489,064	20	1,262,367	56	226,697	64	1,489,064	20	.....	.....
45 Τριφυλίας Ἀλακτοκομίας	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
46 Τριφυλίας μεταλλοκομίας	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Τὸ ὅλον	4,374,483	78	2,182,949	43	6,557,432	21	3,381,389	65	2,004,785	65	5,186,165	36	1,167,997	14

Notes: From the left to the right the Table reports the name of the public cashier (i.e., Ταμείον), tax receivables (i.e., Εἰσπρακτέα), tax receipts (i.e., Εἰσπραχθέντα), and the percentage of delayed payments (i.e., Καθυστερούμενα) for the land tax of 1863. Source: HANBG

Figure C3: Final tax administrative units of the Kingdom of Greece



**Notes:** The map shows the final tax administrative units we have in our sample between 1853-1979. Before the annexation of Ionian Islands in Greece in 1864 (grey colour), Greece was divided in 48 provinces. However, for two of those (i.e., Aegina, Oitulo) no cashier was established between 1853-1879, whereas in three cases (i.e., Argos, Xirochori, Messini) a cashier was established after 1874. In the former case, we assume that taxes are collected in the nearest available cashier that in both cases coincides with the cashier of the capital city of the region. We apply the same logic in the latter case, since we merge the new cashiers with those at the shortest distance. Again, for two of the three new cashiers (i.e., Xirochori, Messini) the merging choice coincides with the cashier of the capital city. The Ionian Islands are not part of the sample.