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THE POLITICAL ECONOMY OF STATUS COMPETITION: SUMPTUARY LAWS IN PREINDUSTRIAL EUROPE

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Abstract

Sumptuary laws that regulated clothing based on social status were an important part of the political economy of premodern states. We introduce a model that rationalizes the use of sumptuary laws by elites to regulate status competition from below. Our model predicts a non-monotonic effect of income – sumptuary legislation initially increases with income, but then falls as income increases further. The initial rise is more likely for states with less extractive institutions, whose ruling elites face greater status threat from the rising commercial class. We test these predictions using a newly collected dataset of country and city-level sumptuary laws.

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The Political Economy of Status Competition: Sumptuary Laws in Preindustrial Europe

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Abstract

Sumptuary laws that regulated clothing based on social status were an important part of the political economy of premodern states. We introduce a model that rationalizes the use of sumptuary laws by elites to regulate status competition from below. Our model predicts a non-monotonic effect of income – sumptuary legislation initially increases with income, but then falls as income increases further. The initial rise is more likely for states with less extractive institutions, whose ruling elites face greater status threat from the rising commercial class. We test these predictions using a newly collected dataset of country and city-level sumptuary laws.

> Sumptuary laws are about as old as polities

<div align="right">

Jean-Jacques Rousseau (1754)

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> It is unfortunately an established fact that both men and womenfolk have, in utterly irresponsible manner, driven extravagance in dress and new styles to such shameful and wanton extremes that the different classes are barely to be known apart

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Nuremberg Ordnance of 1657, Quoted in Hunt (1996).

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1 Introduction

Status competition is an important economic phenomenon. Recent research has explored its consequence for the consumption of luxury goods (Charles et al., 2009), risk taking (Ray and Robson, 2012), human capital acquisition (Moav et al., 2012), and inequality (Genicot and Ray, 2017). The political economy of status competition, however, is less understood.

We turn to history to shed light on how legislation can perpetuate or ameliorate status competition through laws that restrict the consumption of status goods. Specifically, we consider laws that limited who could wear and consume what goods.

Such sumptuary laws were denounced by Adam Smith (1776) as the "highest impertinence and presumption". As rulers are "the greatest spendthrifts in the society," he cautioned them to "look well after their own expence, and they may safely trust private people with theirs. If their own extravagance does not ruin the state, that of their subjects never will." But Smith did not investigate why sumptuary laws were in place or why they fell from favor. While they have attracted attention from historians and sociologists, sumptuary laws have been neglected in the burgeoning recent literature on the historical political economy and institutions of Western Europe.

Many potential explanations for why ruling elites invested in sumptuary legislation have been suggested, some plausible, others specious. Rulers at times defended sumptuary legislation on the grounds that it would reduce crime; because money spent on luxuries could not be used to pay taxes; to reduce budget deficits; and because luxury was a source of immorality and decadence.[1]

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[1] Medieval French sumptuary laws were intended to encourage martial virtues among the nobility (Moyer, 1996, 46). The Elizabethan sumptuary legislation of 1563 explicitly argued for a link between luxury and crime (Kirtio, 2012). Early 17th century French sumptuary laws were justified in terms of reducing the flow of money to Italy, which was seen to be the leading producer of luxury goods (Freudenberger, 1963, 41).

Historians have linked sumptuary laws to a desire to maintain status distinctions. Killerby argues that sumptuary laws were imposed because it was felt that "luxury could be used to erode class distinctions and could encourage public disorder" (Killerby, 2002, 7). Freudenberg observes that the "power of money unquestionably posed a threat to the established privilege". As a consequence, the "exclusive use of fine cloth and other luxuries was one way in which traditional elites wanted to retain a visible position of eminence" (Freudenberger, 1963, 37). For Postan et al. (1963, 420-21): "The purpose of sumptuary laws was in part to prevent the rich from ruining themselves through fruitless competition".

Building on the work of previous scholars, we compile data on sumptuary laws at both the country and the city-level for medieval and early modern Europe. These data reveal the following stylized facts: First, sumptuary laws were largely absent in agrarian, non-commercial, societies— there were, for instance, no sumptuary laws in medieval Europe until the 12th century. Second, sumptuary laws proliferated in rapidly commercializing and growing economies, such as the city states of Renaissance Italy. Third, sumptuary laws declined in the 17th and 18th centuries.

To disentangle the different explanations proposed for sumptuary laws, we propose a model of sumptuary legislation. We analyze sumptuary laws as a response by ruling elites to the "status threat" posed by the rising commercial classes. Our model generates a non-monotonic relationship between income and sumptuary legislation and provides conditions under which this non-monotonicity follows an inverted-U pattern.

In our analysis individuals care about relative, and not absolute, status-good consumption. They derive negative utility from the consumption of status goods, i.e. clothing, of the competing class, and therefore allocate their income so as to maximize 'status distance' – the difference between their status-good competition and those of the competing class, as well as their (absolute) consumption of other 'ordinary' goods.

We consider two groups: the ruling elites and ordinary citizens. At very low levels of income, each group prefers to allocate their income entirely on ordinary goods, thereby obviating the need to regulate status goods. At very high income, both citizens and elites spend money on status goods but as citizens have sufficient resources to evade whatever sumptuary legislation that elites impose, this increases the cost to elites of enforcing sumptuary laws. To maintain or increase their status

distance from citizens, the ruling elites then prefer to use their income to buy more status goods, rather than depress the status-good consumption of citizens by enforcing sumptuary laws. Only at intermediate levels of income is the status threat from citizens binding from below — citizens are rich enough to consume status goods, but find the costs of evading sumptuary laws too high. This, then, makes enforcement worthwhile for the ruling elites, and induces them to enact sumptuary laws in order to curtail the citizens' consumption of status goods.

Thus, an inverted-U relationship between income and sumptuary legislation is obtained precisely because ruling elites compete in the consumption of status goods. If they did not care about their own status-good consumption, but only wanted to curtail the status-good consumption of citizens for the sake of, e.g. maintaining order, preventing crime, encouraging savings, then income would (monotonically) increase the proclivity of elites to enact sumptuary laws because they would have more resources to enforce such laws. It is this feature that distinguishes sumptuary legislation from laws against "bads" or goods with negative externalities as studied by Becker et al. (2006); Desierto and Nye (2017).

We next consider the role of rent-seeking in modifying the relationship between income sumptuary laws. We find that (intermediate) income levels are more likely to result in sumptuary legislation in states whose ruling elites can only extract a moderate amount of rents. In this case, the elites' disposable income, and therefore their ability to consume status goods, is limited, which makes the status threat from citizens more binding.

Turning to the data, we find that this non-monotonic relationship between income and sumptuary legislation is evident at the country-level. Countries at very low levels of GDP per capita were unlikely to pass sumptuary laws as were countries with high levels of GDP per capita. It was at intermediate levels of GDP per capita that we observe the highest frequency of sumptuary legislation. These findings are robust to the inclusion of controls and fixed effects.

Naturally, there are limitations in using country-level data. To better identify the effects of income on the initial rise in sumptuary legislation, we employ another, city-level, dataset. City-level estimates of historical GDP per capita are not available. By studying city-level sumptuary laws we are, however, able to leverage a source of exogenous variation in per capita income: outbreaks of the bubonic plague. As medieval European economies were Malthusian, plague outbreaks

generated upwards wage pressure and higher incomes per capita (Voigtländer and Voth, 2013; Jedwab et al., 2019). Thus we can test the hypothesis that within intermediate levels of income, high levels of income increase the probability of elites enacting a sumptuary law. We find that cities that were affected by the plague in the previous years were more likely to enact a sumptuary law in the next period. Finally, we find that the relationship between plagues and sumptuary laws is strongest in states were rent-seeking was likely to be moderate.

We make several contributions. First, a recent literature in economics examines the importance of social identity (Akerlof and Kranton, 2000, 2010; Bénabou and Tirole, 2011). The political economy of enforcing social identities, however, remains less well understood. In one of the few papers to consider how social identity interacts with political economy, Carvalho and Dippel (2020) consider the role played by elite identity in preserving oligarchy in the colonial Caribbean. The passing and enforcing of sumptuary laws provides a very different setting and instance of how social identity impacted the political economy of premodern societies. Sumptuary laws were part of a wider institutional framework of identity rules that discriminated between individuals based on their social identity and enforced identity differences. They provide an important example of how social identity can effect economic policy.

Second, our analysis is related to work on positional goods and envy. Going back to Veblen (1899), economists have observed that status competition can produce sub-optimal outcomes. If an individual cares about her relative position in society, she will spend more on 'positional' goods in an attempt to buy status, but if everyone else also cares about their status, they will also increase their spending on positional goods, and in equilibrium all this additional expenditure is effectively wasted (e.g. Frank, 1985, 2005; Bagwell and Bernheim, 1996). Gershman (2014) constructs a model in which envy can either stimulate or retard effort and economic growth. In an African context, Platteau (2000) studies how envy manifests itself in witchcraft beliefs. Relative to this literature, we examine a setting where concerns about relative consumption were enacted in the form of legislation that shaped European culture and society for many centuries.

Third, scholars have pointed to the role of rent-seeking and extractive institutions in limiting economic growth (North and Thomas, 1973; North, 1981, 1990; Acemoglu et al., 2005; Acemoglu and Robinson, 2012). As institutions, sumptuary laws restricted the consumption of citizens,

benefiting elites at the expense of the rest of society. They also imposed costs on society by inducing distortions, such as encouraging merchants to buy titles of nobility rather than reinvesting their profits in commerce. Our analysis of sumptuary legislation thus relates to studies of institutions that restricted commerce and markets both in Europe (Heckscher, 1955a,b; Ekelund and Tollison, 1981; Root, 1994; Ekelund and Tollison, 1997; Epstein, 2000) and elsewhere (Dell, 2010; Acemoglu and Robinson, 2012). Understanding how sumptuary laws functioned complements recent studies on the prohibition on usury (Koyama, 2010; Rubin, 2017), Islamic law (Kuran, 2010; Kuran and Lustig, 2012), and the restrictions imposed by craft guilds (Ogilvie, 2019). As sumptuary laws were particularly frequently resorted to in city states, studying them also sheds light on the late medieval decline of independent city states identified by Stasavage (2014).

Finally, scholarship has distinguished between *institutional* and *cultural* accounts of the origins of economic growth.[2] An important institutional change was the shift from identity rules to general rules (North et al., 2009; Johnson and Koyama, 2019). But little is known about the process through which societies switched from identity rules to general rules. In the case of sumptuary laws, we find that this shift could have been induced by economic growth.

While many historians have studied sumptuary legislation both in Europe and elsewhere (see the essays collected in Riello and Rublack (2019)), economic historians have largely neglected sumptuary laws. One exception is Ogilvie (2010) who studies the enforcement of sumptuary legislation, largely on women, in early modern Germany. Drawing on archival evidence from Wildberg, she finds that violations were frequently sanctioned and that sumptuary laws had real bite. Another exception is Dari-Mattiacci and Plisecka (2012) who develop a simple signaling model to explain Roman sumptuary legislation.

The paper is structured as follows. Section 2 details the historical context. In Section 3 we introduce a theoretical model and derive several predictions. We demonstrate, in Section 4 that there is a non-monotonic, inverted-U, relationship between per capita income and sumptuary legislation and provide evidence of the positive relationship between per capita income and sumptuary laws at intermediate levels of income. In Section 4.3 we test an additional prediction of

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[2]The former seek to isolate a change in that incentive structures facing individual actors ("rules of the game") capable of explaining the acceleration of economic growth (North, 1981, 1990; Acemoglu et al., 2005). Culture based arguments look for evidence of changing beliefs as prompting an acceleration of innovation (Mokyr, 2002, 2009, 2016) or more positive attitudes towards commerce (McCloskey, 2006, 2010, 2016).

the model: that the non-monotonic relationship between income and sumptuary legislation is less likely in environments where there is more rent-seeking by elites. Section 5 concludes.

2 Historical Setting, Background & Data

Definition, Motivation, & Enforcement Sumptuary laws regulated dress and extravagant expenditure. Sumptuary laws typically forbade members of the lower orders from wearing luxurious, more expensive items of clothing. Such laws were common across pre-modern societies, particularly in societies where dress was an important signifier of status, as in Republican Rome (see Appendix D), and especially in late medieval Europe. Laws regulating dress proliferated in the Italian city states of the twelfth century during a period of increased trade and prosperity. Ostracized groups such as Jews were typically forced to wear special garb (Roth, 1928). They were common in both China and Japan (Shively, 1964a). Harte (1976b) described them as an "identifying characteristic" of the pre-industrial world.

Sumptuary laws varied across time and place. But they shared several features in common. They sought to control consumption. They targeted specific classes of individuals, designating some clothes or expenditures prohibited for one class, but permitted for their social betters. For example, in France in 1485, gold, silver, and silk cloth were prohibited for all but "nobles living nobly and who are born and extracted of good and old nobility" (quoted in Moyer, 1996, 10).[3] Sumptuary laws were thus distinct from both simple luxury taxes or mercantilist encouragement of domestic industry.

Sumptuary laws where taken seriously by policymakers.[4] They were also enforced, albeit imperfectly. Florence alone enacted at least 62 separate pieces of sumptuary legislation in the thirteenth, fourteenth, and fifteenth centuries. Venice enacted 42 different laws between 1299 and 1499. In Bologna, 21 different laws were passed in this period (Killerby, 2002, 28-29). While sumptuary legislation was certainly widely evaded and laws were difficult to enforce, compliance

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[3]These laws were a reaction to the specific complaints of elites. Moyer reports complaints such as "I say, opportunely, that every person is now clothed in velvets and silk cloth, which is an extremely damaging thing to the wealth and morals of the kingdom; for there is now not a *ménétrier*, *varlet de chambre*, *barbier*, *gens d'arms* who is not clothed in velvets, who doesn't have a gold necklace or signet-ring on his fingers, like princes . . . " (quoted in Moyer, 1996, 11).

[4]For instance, the sumptuary legislation of 1515 received the attention of both Henry VIII and Thomas Wolsey (Baldwin, 1926, 151).

appears to have been high (Doda, 2014). When individuals violated sumptuary laws, they were punished.[5] Punishments includes confiscation of the goods in question, monetary fines, loss of employment, and on occasion excommunication and even imprisonment (Mola and Riello, 2019, 220). In the Ottoman empire violation of sumptuary laws could result in capital punishment (398 Zifli, 2019).

Figure 1: Sumptuary Legislation Over Time .
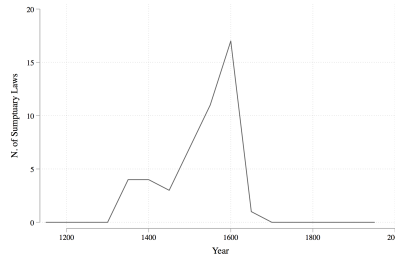
(a) Sumptuary Legislation in France   (b) Sumptuary Legislation in England   (c) Sumptuary Legislation in the HRE
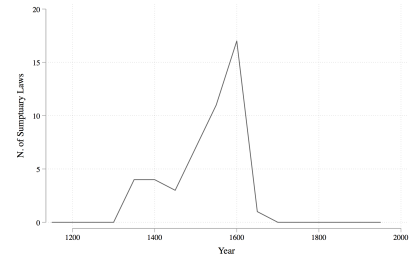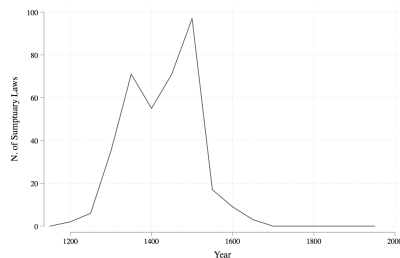
(d) Sumptuary Legislation in Italy   (e) Sumptuary Legislation in the Low Countries   (f) Sumptuary Legislation in Spain
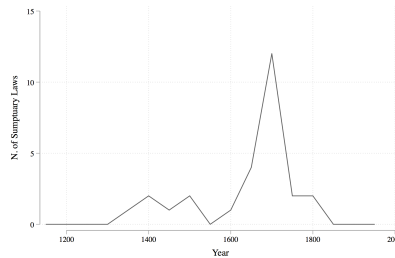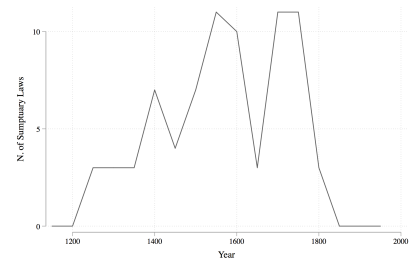
Data Sources: See Appendix 1.

Data   We employ two datasets: a country-level dataset for all of Europe and a city-level dataset for late medieval Italy.

Our country-level dataset contains information on 1181 sumptuary laws across Europe spanning the medieval and early modern period. We use this dataset to track the number of sumptuary laws at the country level from 1100 to 1850. We collected this dataset by building on the work of numerous historians who have worked on specific countries or cities. While the resulting

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[5]Perhaps a modern parallel are laws prohibiting the consumption of certain drugs. These are widely flouted and it is possible to obtain illegal drugs fairly easily; yet substantial resources are nonetheless invested in curtailing their use.

listing does not capture the entire universe of sumptuary laws, we believe it is representative; it is certainly the largest list of sumptuary laws that has been put together. Important sources include Hooper (1915) and Baldwin (1926) for England; Moyer (1996) for France; Guarinos (1788) and Wunder (2019) for Spain; as well as numerous local and city level sources for Germany, the Low Countries, and other parts of Europe. For our city-level analysis we focus on sumptuary laws in medieval and Renaissance Italy. This data was originally collected by Killerby (2002). Further details of data construction are provided in Appendix 1.

The information we have typically only lists the passing of a sumptuary law. It does not provide systematic information on the content of each law. Nor does it distinguish between laws on new products or laws that updated or renewed existing sumptuary legislation. Thus it can be viewed as measuring sumptuary legislation on the extensive rather than the intensive margin.

The Rise and Fall of Sumptuary Legislation Figure 1 depicts the rise and fall of sumptuary legislation in France, England, the Holy Roman Empire, Italy, the Low Countries and Spain by 50-year time period using our newly collected dataset.[6] Across Europe, sumptuary legislation followed broadly the same pattern. Sumptuary legislation was rare until the late Middle Ages. Sumptuary laws first appeared in the rapidly developing and commercializing Italian city states. The earliest medieval sumptuary law was passed in Genoa in 1157. The number of regulations increased dramatically in the late Middle Ages and continued to be high in the 16th and 17th centuries before declining.[7]

What explains this pattern? In the next section, we propose a model that sheds light on the formation, proliferation, and decline of sumptuary legislation, and derive several predictions that we test using both the country-level and city-level datasets documented here.

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[6]Naturally, historical borders have changed over time. Where we had to make a coding decision, we choose whatever was historically meaningful. Thus England and Scotland were separate realms until 1603 and not formally unified until 1707. In our benchmark we make Spain and Portugal one country for the period 1580-1640. See Appendix 1.

[7]Our data does not include religious sumptuary laws such as those that applied to Jews throughout the medieval and early modern period. We leave these for future study.

3   A Model: Status Competition and Sumptuary Laws

In our model, ruling elites and citizens consume ordinary goods, and goods, i.e. clothing, that convey their status. However, the elites can limit the status-good consumption of citizens by enacting sumptuary laws. Elites incur costs in order to enforce the law since citizens can disobey the law, in which case the latter incur some penalty if caught. Elites allocate their disposable income between their consumption of status goods and ordinary goods, as well as the costs of enforcement should they enact a sumptuary law. Citizens allocate their disposable income between their consumption of status and ordinary goods, as well as the costs of evading the law should they choose to disobey it.

We abstract from the process by which total income Y is produced, and only assume that Y can be in a low state, $Y = Y^L$, or a high state, $Y = Y^H$. We then derive, in Section 4, the effect of total income on the probability that a sumptuary law is enacted, as well as the effect of proportion τ of total income that accrues to the ruling elites. One can then think of Y as being produced by citizens, from which τY are appropriated as rents by elite, and the remainder, $(1 - \tau)Y$, accruing to citizens.

3.1   Timing of the Game

Consider a Markov game S in which the following stage game is played at each time period $t = \{0, 1, \ldots, \infty\}$:

1. State $Y = \{Y^L, Y^H\}$ is revealed, $Y^L < Y^H$, which determines the disposable income y_i of player $i \in \{E, B\}$, where E denotes the ruling elite and B the ordinary citizens, the number of each is normalized to 1.[8]

2. The elites E choose whether to enact a sumptuary law ($\eta = 1$) or not ($\eta = 0$).

3. If $\eta = 0$, then, simultaneously, each player i chooses how to allocate her disposable income y_i

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[8]B can be thought to stand for 'bourgeoisie'. This terminology is a convenient shorthand for the merchants, townsmen, and artisans who populated medieval and early modern Europe but who were not members of the ruling elite and whose incomes were to some extent appropriate by the ruling elite. By this usage we do not intend to be implicated in the historical debate about the existence and definition of the bourgeoise as a historical category (see Maza, 2011).

over bundle (x_i, l_i), where $x_i \in \mathbb{R}_{\geq 0}$ denotes ordinary goods and $l_i \in \mathbb{R}_{\geq 0}$ status goods that i consumes.

4. If $\eta = 1$, B chooses whether to obey the law ($\omega = 1$) or not ($\omega = 0$). If $\omega = 0$, E incurs fixed cost C_F and variable cost C for enforcing the law. If $\omega = 1$, E incurs only fixed cost C_F. In particular, let $\bar{l}_B \in [0, L]$, $L \in \mathbb{R}_{\geq 0}$, denote the maximum amount of status goods that E permits B to consume. Then $C_F : [0, L] \to \mathbb{R}_{\geq 0}$ is a function of $\bar{l}_B$, where:

$$C_F(L) = 0 \quad ; \frac{\partial C_F}{\partial \bar{l}_B} < 0 \quad \text{for} \quad \bar{l}_B \in [0, L) \, ,$$

while $C : [0, L] \times \mathbb{R}_{\geq 0} \to \mathbb{R}_{\geq 0}$ is a function of $\bar{l}_B$ and B's consumption of the status good, l_B, where:

$$C(L, 0) = C(L, l_B) = C(\bar{l}_B, 0) = 0 \quad ; \frac{\partial C}{\partial \bar{l}_B} < 0, \frac{\partial C}{\partial l_B} > 0 \quad \text{for} \quad \bar{l}_B \in [0, L) \text{ and } l_B > 0 \, .$$

Also, if $\omega = 0$, B incurs fine F if caught. The probability of being caught $\chi : [0, L] \times \mathbb{R}_{\geq 0} \to [0, 1]$ is a function of $\bar{l}_B$ and l_B where:

$$\chi(L, 0) = \chi(L, l_B) = \chi(\bar{l}_B, 0) = 0 \quad , \frac{\partial \chi}{\partial \bar{l}_B} < 0 \quad \frac{\partial \chi}{\partial l^B} > 0 \quad \text{for} \quad \bar{l}_B \in [0, L) \text{ and } l_B > 0 \, .$$

Denote the odds-ratio of being caught as $\theta = \frac{\chi}{1-\chi}$, where

$$\theta(L, 0) = \theta(L, l_B) = \theta(\bar{l}_B, 0) = 0 \quad , \frac{\partial \theta}{\partial \bar{l}_B} < 0 \quad \frac{\partial \theta}{\partial l_B} > 0 \quad \text{for} \quad \bar{l}_B \in [0, L) \text{ and } l_B > 0 \, .$$

The fine $F : [0, L] \times \mathbb{R}_{\geq 0} \longrightarrow \mathbb{R}_{\geq 0}$ is also a function of $\bar{l}_B$ and l_B, where

$$F(L, 0) = F(L, l_B) = F(\bar{l}_B, 0) = 0 \quad , \frac{\partial F}{\partial \bar{l}_B} < 0, \quad \frac{\partial F}{\partial l_B} > 0 \quad \text{for} \quad \bar{l}_B \in [0, L) \text{ and } l_B > 0 \, .$$

Thus, if $\omega = 0$, B incurs expected cost of evasion $\theta(\cdot) F(\cdot)$.

5. Simultaneously, B chooses bundle (x_B, l_B), while E chooses $(x_E, l_E, \bar{l}_B)$.

Note that whether a sumptuary law is enacted (η) depends on income (Y); and that whether non-elites evade the law (ω) depends on Y and on η. The consumption choices of both elites and non-elites ((x_i, l_i)), in turn, depend on Y, η, ω, on the choices of the other group (x_{-i}, l_{-i}) and, if

$\eta = 1$, on the level of luxury goods proscribed for non-elites ($\bar{l}_B$) which, in turn, depends on Y, ω, and (x_i, l_i).

We can therefore construct a Markov strategy for the ruling elite E as follows: $\sigma^E = \{\eta, (x_E, l_E, \bar{l}_B)\}$, where $\eta : \{Y^L, Y^H\} \rightarrow \{0, 1\}$, $(x_E, l_E) : \{Y^L, Y^H\} \times \{0, 1\} \times \{0, 1\} \times \mathbb{R}^2_{\geq 0} \rightarrow (\mathbb{R}_{\geq 0}, \mathbb{R}_{\geq 0})$ when $\eta = 0$ and $(x_E, l_E, \bar{l}_B) : \{Y^L, Y^H\} \times \{0, 1\} \times \{0, 1\} \times \mathbb{R}^2_{\geq 0} \rightarrow (\mathbb{R}_{\geq 0}, \mathbb{R}_{\geq 0}, [0, L])$ when $\eta = 1$.

A Markov strategy for ordinary citizens B is $\sigma^B = \{\omega, (x_B, l_B)\}$, where: $\omega : \{Y^L, Y^H\} \times \{0, 1\} \rightarrow \{0, 1\}$, $(x_B, l_B) : \{Y^L, Y^H\} \times \{0, 1\} \times \{0, 1\} \times \mathbb{R}^2_{\geq 0} \rightarrow (\mathbb{R}_{\geq 0}, \mathbb{R}_{\geq 0})$ when $\eta = 0$ and $(x_B, l_B) : \{Y^L, Y^H\} \times \{0, 1\} \times \{0, 1\} \times \mathbb{R}^2_{\geq 0} \times [0, L] \rightarrow (\mathbb{R}_{\geq 0}, \mathbb{R}_{\geq 0})$ when $\eta = 1$.

Let Σ^i be the set of all such Markov strategies for player $i \in \{E, B\}$, $\Sigma = \Sigma^E \times \Sigma^B$, and $V^i : \Sigma \rightarrow \mathbb{R}_{\geq 0}$ the payoff to player i. Game S is thus defined as $S = \langle \{E, B\}, (\Sigma^i, V^i)_{i \in \{E, B\}} \rangle$.

3.2 Payoffs

At each time period, player $i \in \{E, B\}$ derives utility from her consumption of ordinary good, x_i, and her status distance from the competing social class – specifically, the difference between her status-good consumption, l_i, and that of the other player, l_{-i}. The one-period utility takes the following form:

$$U_i = \begin{cases} u(x_i, (l_i - l_{-i})) & \text{if } y_i > \bar{Y}_i \\ u(x_i) & \text{if } y_i \leq \bar{Y}_i \end{cases} \tag{1}$$

where $\bar{Y}_i$ denotes some threshold level of disposable income, above which the player cares about status distance.

In steps 3 and 5 of the game, player i maximizes (1) with respect to her budget constraint. The elites' disposable income is $y_E = \tau Y$, where $\tau = [0, 1]$ is the extent to which they appropriate income Y that is produced by ordinary citizens. The latter's disposable income is thus $(1 - \tau)Y$. Such disposable incomes are spent on the consumption of ordinary goods, priced at 1, and status goods, priced at ρ, as well as on the costs of enforcement of E if a sumptuary law is enacted, and cost of evasion of B if she disobeys it.

Denote $x_{i,case}, l_{i,case}$ as the optimal values of x_i, l_i chosen by player i, $\bar{l}_{B,case}$ the optimal value of $\bar{l}_B$ chosen by E, and $U_{i,case}$ the indirect utility function obtained by i under $case = \{a, b, c, d, e, f\}$,

where:

a denotes low-income state and no sumptuary law enacted, i.e. $\qquad Y = Y^L, \eta = 0$

b denotes high-income state and no sumptuary law enacted, i.e. $\qquad Y = Y^H, \eta = 0$

c denotes low-income state and sumptuary law enacted and obeyed, i.e. $\quad Y = Y^L, \eta = 1, \omega = 1$

d denotes high-income state and sumptuary law enacted and obeyed, i.e. $\quad Y = Y^H, \eta = 1, \omega = 1$

e denotes low-income state and sumptuary law enacted and disobeyed, i.e. $\quad Y = Y^L, \eta = 1, \omega = 0$

f denotes high-income state and sumptuary law enacted and disobeyed, i.e. $\quad Y = Y^H, \eta = 1, \omega = 0$

We then use the one-period indirect utilities to construct payoff V_{case}^i, the discounted infinite stream of indirect utilities, with the discount rate denoted as β. To proceed, we first make the following assumptions. First, we assume that the high-income state is absorbing. Second, we pin down the threshold level of income above which status concerns become relevant. These two assumptions enable us to focus on a period where incomes were sufficiently high, as it is then that we observe widespread sumptuary legislation. Third, we consider only non-homothetic preferences over x_i and status distance $(l_i - l_{-i})$, so as to rule out linear expansion paths in income. This, then, allows income to have a non-monotonic effect on sumptuary legislation.

Assumption 1. *Absorbing high-income state. Initially, there are no sumptuary laws and the game is in state Y^L. With probability q it transitions to Y^H and with probability $(1 - q)$ it remains in Y^L. Once the game is in Y^H, it remains in that state.*

Assumption 2. *Threshold income level. Let $\bar{Y}_E = \tau Y^L$ and $\bar{Y}_B = (1 - \tau)Y^L$.*

Both assumptions are empirically motivated. Sumptuary laws emerged only in the 12th century during the Commercial Revolution—a period that economic historians have established was one of rising incomes (De Roover, 1952; Lopez, 1971; Greif, 2006). The gains made by the European economy during the Commercial Revolution were not subsequently reversed. Assumptions 1 and 2 allow us to focus on a period of high incomes in which both players always care about status distance, and show that even if the economy were to remain in this state, sumptuary legislation can decrease.

Assumption 3. ***Non-homothetic preferences.*** *Let $y_i > \bar{Y}_i$ for each player i. Then, for every $a > 0$,*
$u(ax_i, a(l_i - l_{-i})) \neq au(x_i, (l_i - l_{-i}))$.

Non-homothetic preferences have been found to be necessary to match theory to data in both the growth and trade literatures (Hunter, 1991; Matsuyama, 2000; Foellmi and Zweimüller, 2006; Fieler, 2011).[9] Homotheticity generates linear Engle curves that are at odds with the empirical finding that consumption patterns change with income. In the historical growth literature, Galor and Moav (2004) employ non-homothetic preferences over consumption and bequests to generate a shift from physical to human capital accumulation. Voigtländer and Voth (2013) employ non-homothetic preferences to show how the Black Death and warfare could have increased per capita income in a Malthusian world.

The discounted infinite stream of indirect utilities can now be constructed as follows. Under case a, and with probability q of transitioning to case b, ordinary citizens obtain $V_a^B = U_{B,a} + \beta[qV_b^B + (1-q)V_a^B]$ or, simplifying, $V_a^B = \frac{U_{B,a} + \beta q V_b^B}{1 - \beta(1-q)}$. Now, since state Y^H is absorbing, under case b, $V_b^B = U_{B,b} + \beta V_b^B$ or, simplifying,

$$V_b^B = \frac{U_{B,b}}{1 - \beta}. \tag{2}$$

Plugging into V_a^B gives

$$V_a^B = \frac{(1-\beta)U_{B,a} + \beta q U_{B,b}}{(1-\beta)[1 - \beta(1-q)]}. \tag{3}$$

Analogously for the ruling elite:

$$V_b^E = \frac{U_{E,b}}{1 - \beta} \tag{4}$$

$$V_a^E = \frac{(1-\beta)U_{E,a} + \beta q U_{E,b}}{(1-\beta)[1 - \beta(1-q)]}. \tag{5}$$

Under case c, citizens would obtain $V_c^B = U_{B,c} + \beta[qV_d^B + (1-q)V_c^B]$ or, simplifying, $V_c^B = \frac{U_{B,c} + \beta q V_d^B}{1 - \beta(1-q)}$. Again since Y^H is absorbing, we can write V_d^B as:

$$V_d^B = \frac{U_{B,d}}{1 - \beta}. \tag{6}$$

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[9]Fieler (2011, 1070) observes that "there is exhaustive evidence that the income elasticity of demand varies across goods and that this variation is economically significant".

Plugging into V_c^B gives

$$V_c^B = \frac{(1-\beta)U_{B,c} + \beta q U_{B,d}}{(1-\beta)[1-\beta(1-q)]}. \tag{7}$$

Analogously for the ruling elites:

$$V_d^E = \frac{U_{E,d}}{1-\beta} \tag{8}$$

$$V_c^E = \frac{(1-\beta)U_{E,c} + \beta q U_{E,d}}{(1-\beta)[1-\beta(1-q)]}. \tag{9}$$

Lastly, consider cases e and f. For player $i \in E, B$,

$$V_f^i = \frac{U_{i,f}}{1-\beta} \tag{10}$$

$$V_e^i = \frac{(1-\beta)U_{i,e} + \beta q U_{i,f}}{(1-\beta)[1-\beta(1-q)]}. \tag{11}$$

3.3 Equilibrium

Proposition 1. *Game S has a unique Markov Perfect Equilibrium $(\sigma^{E*}, \sigma^{B*} = (\{\eta^*(x_E^*, l_E^*, \bar{l}_B^*)\}, \{\omega^*(x_B^*, l_B^*)\})$ where:*

$$\eta^* = \begin{cases} 1 & \text{if } U_{E,f} \geq U_{E,b} \\ & \text{or } U_{E,f} < U_{E,b} \text{ and } U_{B,d} \geq U_{B,f} \\ 0 & \text{if } U_{E,f} < U_{E,b} \text{ and } U_{B,d} < U_{B,f} \end{cases} \tag{12}$$

$$\omega^* = \begin{cases} 1 & \text{if } U_{B,d} \geq U_{B,f} \\ 0 & \text{otherwise} \end{cases} \tag{13}$$

$$(x_E^*, l_E^*, \bar{l}_B^*) = \begin{cases} (x_{E,f}, l_{E,f}, \bar{l}_{B,f}) & \text{if } U_{E,f} \geq U_{E,b} \\ (x_{E,b}, l_{E,b}, \bar{l}_{B,b}) & \text{otherwise} \end{cases} \tag{14}$$

$$(x_B^*, l_B^*) = \begin{cases} (x_{B,d}, l_{B,d}) & \text{if } U_{B,d} \geq U_{B,f} \\ (x_{B,f}, l_{B,f}) & \text{otherwise} \end{cases} \tag{15}$$

Proof. See Appendix. □

3.4 Empirical Implication

Notice from equations (12) to (15) that the Markov perfect strategy of each player only depend on the one-period indirect utilities. This is an artifact of Assumption 1 – since the high-income state is absorbing, the equilibrium outcome of game S is the same as that of a one-shot version in which $Y = Y^H$ and the stage game of S is played once.

We choose to adopt a Markov, rather than a one-shot, game in order to match what we observe empirically. Sumptuary laws were often repeatedly passed by European states. Interpreted through the lens of our model, this empirical pattern can be obtained if rulers repeatedly choose $\eta = 1$. In other words, it can be viewed as if they were playing a one-shot version of game S a number of times. As the number of repetitions is uncertain, we adopt an infinite-time horizon, and interpret periods in which sumptuary laws proliferated as instances in which $\eta = 1$ is a stationary equilibrium.

In addition, note that the exact values of the one-period indirect utilities depend on the specific values of the set of parameters of the model. To the extent that the latter is drawn from some underlying probability distribution, any particular set of values of $U_{E,f}, U_{E,b}, U_{B,d}, U_{B,f}$ is a random draw. We can then use Proposition 1 to characterize the probability that elites enact a sumptuary law, which can be interpreted as the probability that the parameters are such that the values of the one-period utilities follow the equilibrium conditions laid out in (12). To obtain an expression for this probability using (12) in Proposition 1, let $v \equiv G[(U_{E,f} - U_{E,b})]$ denote the probability that $(U_{E,f} - U_{E,b}) \geq 0$ and $w \equiv G[(U_{B,d} - U_{B,f})]$ the probability that $(U_{B,d} - U_{B,f}) \geq 0$, with G a cumulative distribution function. Then, Proposition 1 implies that

$$Pr(\eta = 1) = v + (1 - v)w. \tag{16}$$

4 The Non-Monotonic Relationship Between Income and Sumptuary Laws

The following result establishes that income has a non-monotonic effect on the probability that elites enact a sumptuary law. In particular, at low levels of income, this probability is zero, and so increasing income has no effect on it. At intermediate levels of income, the probability increases with income, but at very high levels of income, the probability of enacting a sumptuary

law decreases as incomes rise.

Proposition 2. *Fix the value of Y^L and let $Y^H \in [Y^0, +\infty)$, with $Y_0 > Y^L$. Assume that: (a) at Y_0, $\frac{\partial v}{\partial Y_0} / \frac{\partial w}{\partial Y_0} < \frac{1-v}{1-w}$; and that (b) $\frac{\partial [\frac{\partial v}{\partial Y^H} / \frac{\partial w}{\partial Y^H}]}{\partial Y^H} > \frac{\partial (\frac{1-v}{1-w})}{\partial Y^H}$ for all $Y^H > Y_0$. Then there exists a threshold level of income Y, i.e. Y^*, such that:*

1. $Y \le Y^L < Y^* \longrightarrow \eta = 0$, $Pr(\eta = 1) = 0$, $\frac{\partial Pr(\eta=1)}{\partial Y} = 0$

2. $Y^L \le Y < Y^* \longrightarrow \frac{\partial Pr(\eta=1)}{\partial Y} > 0$

3. $Y^L < Y^* < Y \longrightarrow \frac{\partial Pr(\eta=1)}{\partial Y} < 0$

Proof. See Appendix.   □

Part (1) of Proposition 2 trivially follows from Assumptions 1 and 2. At very low levels of income, i.e. $Y \le Y^L$, neither citizens nor elites derive utility over status-good consumption. No sumptuary law is passed.

Parts (2) and (3) capture cases in which income is sufficiently high. For any value $Y \in [Y^0, +\infty)$, there is a non-zero probability that a sumptuary law is passed, as given by equation (16). The effect of income on this probability is also non-zero, and is obtained by taking the derivative of (16) with respect to Y. If (a) holds, the effect is positive at low levels of income and as the latter keeps increasing, there will be a point at which the effect switches to being negative, if (b) holds. That is, a cutoff point Y^* exists, at which the direction of the effect changes from positive to negative.[10] Figure 2 illustrates the non-monotonic effect of income on the probability that elites enact a sumptuary law.

What determines this non-monotonic, inverted-U, relationship? It depends on assumptions (a) and (b), which, in turn, depend on the probabilities v, w, and how these behave with respect to income, Y.

Recall that v is the probability that $U_{E,f} \ge U_{E,b}$—the probability that the utility ($U_{E,f}$) that elites obtain if citizens disobeyed the sumptuary law—is at least as large as what they would obtain if

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[10]Proposition 2 establishes the existence of *a* cutoff point Y^*. There may be other cutoff points at income levels larger than Y^* at and beyond which the effect of Y switches again to being positive if $\frac{\partial [\frac{\partial v}{\partial Y^H} / \frac{\partial w}{\partial Y^H}]}{\partial Y^H} < \frac{\partial (\frac{1-v}{1-w})}{\partial Y^H}$ at $Y^H > Y^*$. Our data suggest, however, that for the case of pre-industrial Europe, there is only one cutoff point Y^* since sumptuary laws did not resurge after declining in the 17th and 18th centuries.

they refrained from enacting the law ($U_{E,b}$). How v varies with income depends on the relative size of the effect of income on these two utilities. On one hand, higher income means that elites can purchase more status goods, increasing their status distance from citizens without the need for regulating the latter's consumption, thereby increasing $U_{E,b}$. On the other hand, with higher income, citizens can also afford more status goods, even beyond a regulated limit, and this may induce them to disobey sumptuary laws. This would decrease $U_{E,f}$, unless the larger income of the elites also reduces their enforcement costs so much that the net effect of income on $U_{E,f}$ becomes positive. Thus, depending on the relative sign and magnitude of the effects of Y on $U_{E,f}$ and on $U_{E,b}$, v can increase or decrease with income.

Analogously, w can increase or decrease with income. This depends on how income affects the utility that citizens would obtain if they obey a sumptuary law that is enacted ($U_{B,d}$) and the utility they obtain if they disobey it ($U_{B,f}$). With higher income, citizens can purchase more status goods, but so can the elites, which could induce the former to consume status goods beyond the regulated limit. If the cost of evasion does not increase rapidly enough, or if it decreases with income, then $U_{B,d}$ would rise faster than $U_{B,f}$. In this case, probability w increases with income.

For instance, an inverted-U relationship can be generated as follows. Initially, suppose Y increases $U_{E,f}$ by more than $U_{E,b}$ (which would increase v), as elites have greater resources to enforce sumptuary laws. In addition, suppose Y increases $U_{B,d}$ by more than $U_{B,f}$ (which would increase w), as citizens can better afford modest status-good consumption, that is, without disobeying sumptuary laws and incurring the cost of evasion.

At some point, however, further income growth can make disobeying sumptuary laws more attractive to citizens — Y may increase $U_{B,f}$ by more than $U_{B,d}$, thereby decreasing w. At the same time, enforcement costs rise, becoming prohibitive to elites. In other words, Y may increase $U_{E,f}$ more than it would $U_{E,b}$, thereby decreasing v. Thus, initially, v, w and, hence, $Pr(\eta = 1)$ could rise with income Y, but eventually decrease as Y increases further.

Does this predicted non-monotonic relationship between income and the probability of a sumptuary law hold in our data? We proceed in two steps. First, we use country-level data on the number of sumptuary laws to document that there is indeed an inverted-U relationship between sumptuary legislation and per capita income.

Second, to investigate whether this relationship may be causal, we conduct a panel data analysis of Italian city states using a unique data-set of more than 300 sumptuary laws collected by Killerby (2002). These laws span the period between 1100 and 1500 and cover more than 40 cities. For exogenous variation, we exploit plague outbreaks as these increased the incomes of non-elites. However, since the Killerby dataset does not extend beyond 1500, we are unable to analyze the subsequent decline of sumptuary legislation in these city states. We thus focus on the relationship between intermediate levels of income and sumptuary laws, and test whether it is positive, as predicted by the model.

Figure 2: Illustrating the Non-Monotonic Effects of Income on the Probability of a Sumptuary Law
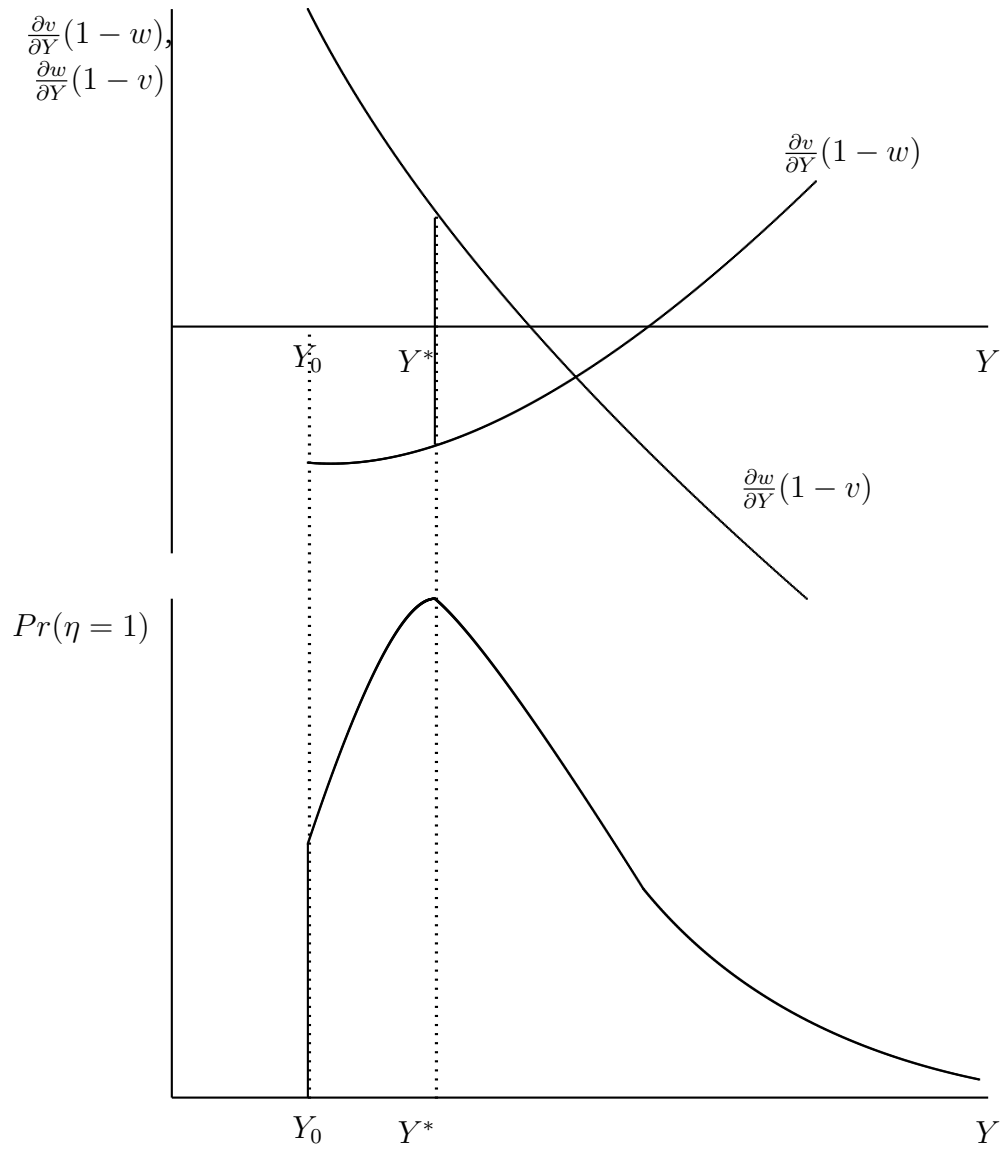
This figure provides an example in which $\frac{\partial v}{\partial Y^0} < 0$ and $\frac{\partial w}{\partial Y^0} > 0$, and $\frac{\partial w}{\partial Y^0}(1-v) > |\frac{\partial v}{\partial Y^0}|(1-w)$ such that assumption (a) is satisfied. Note, then, that $\frac{\partial Pr(\eta=1)}{\partial Y} > 0$ from Y^0 to Y^*, the latter at which the distance $\frac{\partial w}{\partial Y^*}(1-v) - 0$ is exactly equal to the distance $|\frac{\partial v}{\partial Y^*}(1-w) - 0|$. Beyond Y^*, $\frac{\partial Pr(\eta=1)}{\partial Y|Y>Y^*} = \frac{\partial v}{\partial Y}(1-w) + \frac{\partial w}{\partial Y}(1-v) < 0$.

4.1 Inverted-U Relationship Between Sumptuary Laws and Income: Country-Level

Our country-level data provide rich information on the timing of sumptuary legislation at the country-level. We match this information to estimates of historical income per capita from Bassino et al. (2015); Broadberry et al. (2018) and Bolt et al. (2018) . Where available this data is reported at the century-level. Consequently, we conduct our analysis at the country-century level. This allows us to gauge the plausibility of our argument but should, of course, be interpreted with caution. In particular, we run a series of regressions based on the following specification:

$$\text{N. Sumptuary Laws}_{ic} = \alpha_0 + \alpha_1 y_{ic} + \alpha_2 y_{ic}^2 + \mathbf{X}'_{ic}\alpha_3 + \Gamma_i + \epsilon_{ic} \tag{17}$$

where N. Sumptuary Laws denotes the number of sumptuary laws enacted by country i in century c, and y_{ic} its corresponding per capita GDP. We sequentially introduce geographical and institutional controls in $\mathbf{X}'_i$ and country-fixed effects (Γ_{ic}). We cluster standard errors at the country level.

Table 1 column (1) reports the bivariate non-monotonic relationship between income and sumptuary legislation. This relationship is depicted in Figures 3a and 3b. Next, we show that this inverted-U relationship holds when we control for other factors apart from per capita income that may have influenced either the ability of states to enforce sumptuary laws or the proclivity of non-elites to evade sumptuary legislation. First, we include basic geographical variables such as ruggedness and the ratio of coastline to land area, both of which would have constrained the enforcement ability of the state (column 2.). Second, in column (3) we add several institutional variables such as constraints on the executive and the number of wars per year. To capture cultural differences we include information on whether or not a country was Protestant by 1600. As these institutional and cultural controls may be outcomes of both income and sumptuary legislation, the coefficients in column (3) should be interpreted with caution. Finally, we include country fixed effects to capture unobserved country specific heterogeneity (column 4). In this specification, we naturally lose power and precision, but the signs of per capita GDP and per capita GDP[2] remain consistent with the non-monotonic, inverted-U, relationship established in Proposition 2.[11]

This inverted-U relationship between income and sumptuary legislation is difficult to generate

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[11]Ideally we would employ both century and country fixed effects. However, the standard errors would be very large, given the number of countries for which data on sumptuary laws and income per capita is available. See Appendix.
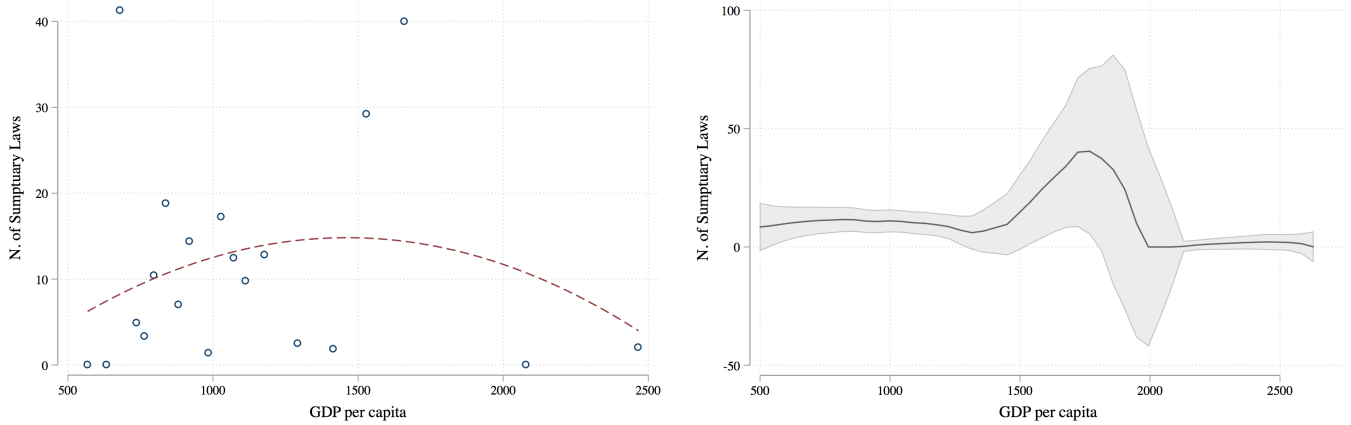
(a) Binscatter of sumptuary laws and GDP per capita. $N =$ (b) Local Polynominal Regression: 90% confidence
88. intervals.

Figure 3: Pooled Country-Level Analysis: Sumptuary Laws and Per Capita GDP. Data described in Appendix 1.

with alternative explanations. For example, Hunt (1996) employs the notion of *governmentality*. He argues that more powerful states sought to extend their legal authority into all aspects of social life, including dress.[12] It is true that the power and capacity of medieval states was increasing in the late Middle Ages (see discussions in Strayer, 1970; Given, 1989). But it kept increasing in the early modern period, when sumptuary legislation declined.

Another related possibility is that the number of all laws, including sumptuary laws, simply increased as societies became richer and more literate. While this is plausible, it also cannot explain why sumptuary laws declined precisely when commercialization increased and societies became even wealthier.

Investments in state capacity made it more feasible for early modern states to enforce sumptuary laws. This would have enabled ruling elites to legislate more and stricter sumptuary laws. Thus, had rulers simply wanted to decrease the status-good consumption of non-elites in order to, e.g. preserve social order, or discourage extravagance, they would have enforced even more sumptuary legislation as incomes continued to rise. In other words, sumptuary laws would not have disappeared.

In contrast, our model shows that if rulers care about their own status-good consumption

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[12]The concept of governmentality is due to Michal Foucault (1979). More general, sumptuary laws could be interpreted as an attempt to increase the "legibility" of the social order to use the terminology of Scott (1999).

Table 1: Sumptuary Laws and Per Capita Income: Country-Level Analysis

| | Number of Laws | | | |
	(1)	(2)	(3)	(4)
GDP per capita	5.15†	4.33*	3.97*	3.23*
	(3.05)	(2.23)	(1.84)	(1.72)
GDP per capital^2	-0.00162*	-0.00132**	-0.000936*	-0.00000619
	(0.000835)	(0.000555)	(0.000473)	(0.000433)
Geographical Controls		✓	✓	✓
Institutional & Cultural Controls			✓	✓
Country Fixed Effects				✓
R^2	0.059	0.089	0.162	0.087
Observations	88	88	88	88

Table Notes: The relationship between per capita GDP and the number of sumptuary laws at a country-level. Standard errors are clustered on country. Geographical controls include ruggedness, coast to area ratio, and region. Institutional and cultural controls include constraints on the executive, wars per year, and whether a state was Protestant by 1600. † denotes a p-value of 0.13. All coefficients are multiplied by 100 for readability

relative to that of non-elites – their status *distance* from the competing social class, then they do not need to keep enacting sumptuary laws. When incomes continue to increase, which enables more evasion by non-elites and makes enforcement even more costly, there comes a point when rulers would instead choose to devote their income to raising their own status-good consumption, rather than depress the status-good consumption of non-elites. Sumptuary legislation rise and then fall as incomes increase precisely because ruling elites compete in status with non-elites.

The empirical patterns that we document, while suggestive, do not establish a causal relationship between income and sumptuary legislation. For instance, it is possible that a third factor that we have not controlled for, influences both income and the probability of sumptuary legislation. To identify the effect of income on sumptuary laws, we turn to city-level data from Italy.

4.2 Positive Relationship Between Sumptuary Laws and Intermediate Levels of Income: City-Level

Real wages increased after the outbreak of the bubonic plague in 1348. For the following 150 years, recurrences of the plague repeatedly reduced populations and put upward pressure on real wages. We exploit plague outbreaks as a source of exogenous variation in income to study the

Italian City States by the Number of Sumptuary Laws
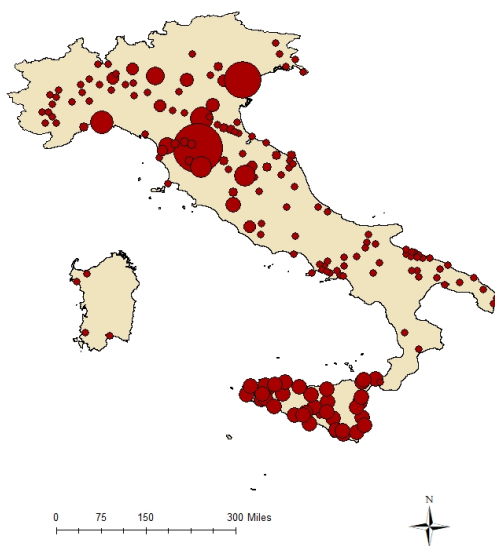
Figure 4: Sumptuary laws in Italian cities: 1300-1500. Source see Appendix 1

effect of income on sumptuary legislation in Renaissance Italy. Figure 4 depicts our data on Italian sumptuary legislation.[13]

The relationship between plague outbreaks and income is well-established. Urban artisans and craftsmen, in particular, saw their incomes grow as demand for their services increased (Dyer, 2005). In England, for example, while the total population halved, "each household could afford to buy more goods, global consumption fell by much less than a half, and in cases such as meat or cloth the total may well have increased ... A reduced number of traders and artisans were kept busy supplying the demand, and their increased workload brought them higher incomes" (Dyer, 2005, 132).[14]

The quality of the dress of ordinary people improved after the Black Death. Before peasants wore simple tunics, "economized on the dyeing of their clothes" by "wearing 'white,' the natural

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[13]Not that Sicilian cities were part of the Kingdom of Sicily and hence all subject to the same number of sumptuary laws in this period.

[14]Reoccurrences of the plague helped to ensure that wages remained high for more than a century following the Black Death. Real wages series for medieval Europe are rare—but the majority of available series demonstrate major increases in real wages after 1350. Figure A.2 depicts the increase in real wages in Florence following the Black Death for illustrative purposes. Table ?? reports the results of several regressions of plague reoccurrence on real wages.

color of the fleece, or russet, a shade of grey" (Dyer, 1989, 176). Afterwards, this changed as ordinary people had the incomes to invest in showery clothing. Peasants "could indulge in the greater comfort of the linings, and dress more colourfully, with blues and greens to some extent replacing the old whites and russets". The "complaints that the lower orders were wearing expensive cloth and luxurious ornaments, first voiced formally in the legislation of 1363, was evidently based on real developments. Such grumbles could have been made for at least the following century-and-a-half, as the cloth industry expanded to supply the home demand as well as markets overseas" (Dyer, 1989, 177). The number of clothes owned by ordinary people also increased. Similar developments are attested to across Europe (see Appendix 2).

Historians have speculated about why sumptuary laws increased following the Black Death. Rublack (2019) writes that "sumptuary legislation reflected a growing concern for social regulation from the fourteenth century in response to plague, famine, extended warfare and greater mobility". For Muzzarelli (2009):

> On the one hand, the tendency toward unnecessary spending could be understood as an expression of vitality unrestrained by the fear of death that the plague perpetuated everywhere. On the other, the high percentage of deaths . . . would have increased, for some people, the possibility of spending lavishly on clothing and jewelry.

In contrast, Proposition 2 provides an *economic* explanation of the increase in sumptuary laws. Increased incomes for peasants, craftsmen and merchants *intensified* status competition. One response was the attempt by elites to crack down on status competition through sumptuary legislation.

The intensity of the initial outbreak of the Black Death was largely exogenous to city characteristics (Jedwab et al., 2019). Subsequent outbreaks of the plague may, however, have been correlated with city-level characteristics such as size, trade links, and transportation infrastructure (Siuda and Sunde, 2017; Dittmar and Meisenzahl, 2018). For this reason, we exploit variation in the timing of a plague reoccurrence and conduct a panel analysis to take in account city-specific unobservables and common time-trends that may be correlated with both plague occurrences and

sumptuary legislation. Specifically, we estimate the following difference-in-differences equation:

$$\text{N. Sumptuary Laws}_{i,d} = \beta \sum_{j=1}^{2} \text{N. Plagues}_{i,d-j} + \mathbf{X}'_{id}\lambda + \Gamma_i + \Lambda_d + \epsilon_{i,d} , \qquad (18)$$

where N. Sumptuary is the number of sumptuary laws in city i and decade d. Our explanatory variable, $\sum_{j=1}^{2} \text{N. Plagues}_{i,d-j}$ is the sum of the number of plague outbreaks in the prior two decades. Γ_i are city fixed effects, Λ_d are decade fixed effects, and $\mathbf{X}$ is vector of city level controls that includes latitude, longitude, Roman roads, whether a city has access to the sea or is on a river, elevation, ruggedness, soil quality, population size in 1300, whether a city had an archbishopric, a bishopric, a university, or was a commune.

Table 2 reports the estimated impact of the plague on the number of sumptuary laws. The sample includes all cities in Italy for which there is information on plague occurrences in Biraben (1975). Our preferred specification includes the interactions of geographic and institutional controls with decade fixed effects. The corresponding incidence ratio (in square brackets) implies that one occurrence of the plague in city i in decade $d-1$ increased the number of sumptuary laws by 1.2.

In Appendix 3, we report various robustness exercises incuding using different lagged measures of plague (Table A.3), and various sub-samples of cities (Table A.5). We also consider spatial autocorrelation using Conley standard errors (Table A.4). None of these exercises significantly modify our baseline results.

Next we consider how this relationship between income and sumptuary legislation would have been influenced by political and economic institutions, specifically the degree and nature of rent-seeking in a society.

4.3 Political Institutions, Rent-Seeking, and Sumptuary Laws

Our dataset on city-level Italian sumptuary allows us to explore the relationship between institutions, income and sumptuary laws. By looking at cities within Italy, we are able to make use of within-country variation as Italian city states varied considerably in their institutions but were otherwise comparable economically and culturally.

Pre-modern polities were structured around the distribution of economic rents (Ekelund and

Table 2: The Effect of Plague Shocks on the Number of Sumptuary Laws: City-Level Panel Analysis by Institutions

| | Number of Laws | | | | | |
| | OLS | | | Poisson | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Plague	0.138***	0.134***	0.134***	0.196***	0.164***	0.159***
				[1.173]	[1.216]	[1.178]
	(0.0399)	(0.0365)	(0.0344)	(0.0339)	(0.0394)	(0.0399)
City FE	✓	✓	✓	✓	✓	✓
Decade FE	✓	✓	✓	✓	✓	✓
Geographic Controls*Decade FE		✓	✓		✓	✓
Institutional Controls*Decade FE			✓			✓
Observations	2719	1761	1761	2719	1761	1761
Adjusted R^2	0.455	0.383	0.384			

Table Notes: This table reports difference-in-differences poisson estimates of the impact of the plague. Columns (1)-(3) report OLS results. Columns (4)-(6) report results obtained by Poisson maximum likelihood. The unit of observation is a city-decade. All specifications include city and decade fixed effects. Geographical controls include longitude, latitude, elevation, whether a city is on a river or the seas, and soil quality. Institutional controls include the presence of universities, bishoprics, and communes. We report incidence ratios in square brackets. Robust standard errors clustered at the city level are reported in brackets.

Tollison, 1981). One influential framework for studying these polities is that of the "natural state" introduced by North, Wallis, and Weingast (2009). Natural states can be viewed through the lens of patron client relationships: "A hierarchy of elite relationships exists in which small groups of powerful elite individuals know one another through direct personal contact and experience. These circles of elite relationships interlock: all elite individuals know and are associated with other elite individuals". However, the degree and character of rent-seeking within natural states varies considerably: "Sometimes elite hierarchies are highly centralized, with a pyramid structure vertically descending from a central king or court. Other natural state hierarchies are much flatter, with more horizontally linked networks of elites" (North et al., 2009, 36).

The late medieval Italian city states fit the latter category. Acemoglu and Robinson (2019) consider them key case studies in the "shackling of Leviathan". Belloc et al. (2016) study the formation of the commune movement in Italy as "a radical change toward broader-based political institutions" (1877). Many Italian city states were on the "doorstep of the transition" from natural states to what North et al. (2009) call open access orders. They created "an impersonal identity

for elite members of the governing coalition: citizens" (North et al., 2009, 151). Stasavage (2014) finds that in the medieval period at least these institutions enabled autonomous cities to perform well economically (though they declined later).

For both cities with representative institutions (communes) and those without, access to public office was a major source of rents. Offices enabled elites to benefit from the economic activity of ordinary citizens. They might involve managing particular properties, collecting taxes, or involvement in the provision of public goods. The commune movements demanded an equal share of public offices for ordinary citizens (*popolo*), widening access (Dean, 2000, 143-144). Therefore, in cities which became and then remained communes, relative to ordinary citizens, the extent of rent-seeking by ruling elites was limited. In despotic regimes—cities dominated by a single ruler, a despot or *signorie* in terminology of contemporaries—this access was restricted to a narrower group of elites.[15]

We can analyze the effect of the level of elite rent-seeking on elites' propensity to enact sumptuary laws using our model. Proposition 3 below establishes that the non-monotonic relationship between income and sumptuary legislation is more likely if ruling elites are *less* rent-seeking, that is, if τ is low.

Proposition 3. *Consider the following special case, in which τ intensifies the effect of Y on θF, C_F, C, $l_{B,f}$, and $l_{B,d}$, and dampens the effect of Y on $l_{B,b}$.*

1. *$\frac{\partial(\frac{\partial\theta F}{\partial Y})}{\partial\tau} > 0$ if $\frac{\partial\theta F}{\partial Y} > 0$, and ≤ 0 otherwise;*

2. *$\frac{\partial(\frac{\partial C_{F,f}}{\partial Y})}{\partial\tau}, \frac{\partial(\frac{\partial C_f}{\partial Y})}{\partial\tau} > 0$ if $\frac{\partial C_{F,f}}{\partial Y}, \frac{\partial C_f}{\partial Y} > 0$, and ≤ 0 otherwise;*

3. *$\frac{\partial(\frac{\partial l_{B,f}}{\partial Y})}{\partial\tau} > 0$ if $\frac{\partial l_{B,f}}{\partial Y} > 0$, and ≤ 0 otherwise;*

4. *$\frac{\partial(\frac{\partial l_{B,d}}{\partial Y})}{\partial\tau} > 0$ if $\frac{\partial l_{B,d}}{\partial Y} > 0$, and ≤ 0 otherwise;*

5. *$\frac{\partial(\frac{\partial l_{B,b}}{\partial Y})}{\partial\tau} < 0$ if $\frac{\partial l_{B,b}}{\partial Y} > 0$, and ≥ 0 otherwise;*

Then, under assumption (b), the non-monotonic effect of Y on $Pr(\eta = 1)$ established in Proposition 2 is more likely to occur when τ is low.

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[15]The case of Ferrara is documented by Dean (1988).

Proof. Under assumption (b), the non-monotonicity is obtained when assumption (a) is met. In turn, the latter is more likely to be met if $\frac{\partial v}{\partial Y}$ is large and $\frac{\partial w}{\partial Y}$ is small, which are more likely under (1) to (4) if τ is low. (See Appendix 4 for details.) $\qquad\square$

Figure 5 provides an illustration: when τ is large, the non-monotonic pattern is hardly apparent — for most values of $Y > Y^0$, the probability of enacting a sumptuary law falls sooner as income increases.

Conditions (1) to (5) imply that the manner by which elites' rent-seeking modifies the non-monotonic effect of income on sumptuary legislation depends on how the rents affect three factors: the citizens' ability to evade the law, the elites' capacity to enforce it, and the status threat from citizens. These are specifically defined below.

Definition. The citizens' **ability to evade** the law is the extent to which income lowers the expected cost of evasion. It is increasing if $\frac{\partial \theta F}{\partial Y} < 0$, and non-increasing otherwise.

Definition. The ruling elites' **enforcement capacity** is the extent to which incomes lowers the costs of enforcement. It is increasing if $\frac{\partial C_F}{\partial Y}, \frac{\partial C}{\partial Y} < 0$, and non-increasing otherwise.

Definition. The **status threat** from citizens is the extent to which income increases the status-good consumption of citizens. It is increasing if $\frac{\partial l_B}{\partial Y} > 0$, and non-increasing otherwise.

Proposition 3 implies that the initial rise in sumptuary legislation is more likely in jurisdictions in which ruling elites are less rent-seeking, if the rents increase the rate at which citizens' ability to evade the law increases (condition (1)) and decrease the rate at which elites' enforcement capacity improves (condition (2)). In addition, it must be that rents decrease the rate at which the status threat from citizens rise when there are no sumptuary laws (condition (5)), but increase it when there are laws to be enforced (conditions (3) and (4)).

Using our Italian dataset, we verify that the relationship between (intermediate levels of) income and sumptuary legislation is indeed stronger for cities in which elites' rent-seeking was low. We use three different codings to capture differences in τ. First, we consider despotisms or signoria, as coded by Killerby (2002). These were city-states ruled by single individual as opposed to a republic. In the 13th century many Italian cities transitioned from being governed as republics or communes to being ruled by a single individual. Notable despotisms include Milan, ruled by the Visconti family or Ferrara by the Este family. We expect τ to be higher in these cities.

Second, we use information from Bosker et al. (2013) and elsewhere to ascertain whether cities were communes in the 12th and 13th centuries. We expect τ to be lower in cities that were communes.

As both these measures are time invariant, we construct our own measure of whether a city's institutions had republican institutions in each decade of our analysis. This allows to us to exploit variation over time in a city's institutions. The downside is that only a small number of city-decades are coded as Republican.

Table 3 reports the effect of plagues on sumptuary legislation when we split the sample according to the degree of rent-seeking by elites τ. The result support Proposition 3 and the observation of historians that "despotic regimes within Italy passed fewer laws than their republican counterparts" (Killerby, 2002, 33-34).

The relationship between income and the number of sumptuary laws is strongly positive for cities that were non-despotic, had historical communes, or were republics. For cities that were despotisms, non-communes, or non-Republican, however, we find either no effect or a significantly smaller effect.

This does not reflect differences in number of observations for despotic cities, non-commune, and non-Republican cities. To address concerns that our results reflect selection effects, we show that no such differences can be found between coasts/non-coast, riverine and non-riverine cities and cities with and without bishoprics (Table 4).

This suggest that the number of sumptuary laws and the intensity of status competition between elites and citizens were more intense in cities with more inclusive institutions that limited the extent of rent-seeking by ruling elites.

A second implication of Proposition 3 is that while cities with less rent-seeking will be more likely to impose sumptuary laws, these sumptuary laws will impose less onerous restrictions on the luxury spending of non-elites. A plausible scenario is as follows. Suppose that as income increases, status-good consumption of citizens rise (i.e. $\frac{\partial l_{B,f}}{\partial Y}, \frac{\partial l_{B,b}}{\partial Y}, \frac{\partial l_{B,d}}{\partial Y} > 0$). Then for enforcement capacity to be increasing as well, i.e. for $\frac{\partial C_{F,f}}{\partial Y}, \frac{\partial C_f}{\partial Y} < 0$, it must be that the maximum status-good consumption permissible for citizens, i.e. $\bar{l}_B$, is higher. This also lowers the cost of evasion, i.e. $\frac{\partial(\theta F)}{\partial Y} < 0$. With falling enforcement costs, ruling elites are able to consume more, including of

status goods.

In other words, both elites and citizens increase status-good consumption as income increases, but the way in which elites limit such status competition is to enact a sumptuary law but enforce it with leniency (i.e. higher $\bar{l}_B$.) Proposition 3 implies that this scenario is more likely in jurisdictions in which the ruling elites are less rent-seeking.

This is evident in the history of Florentine sumptuary laws. For example, the law of 1355 limited the permissible expenditure on women's ornaments to ten gold florins. It permitted women to wear fur but only to keep warm and not to show off—a highly ambiguous provision. It focused on ensuring that these provisions could be enforced: the male head of household was made responsible for violations by members of his family (Rainey, 1985, 139-140). In contrast, Milan was a despotic state and "the Milanese laws of 1396 and, more especially, 1498, were designed to reserve privileges, not just for members of the ruling family of the city, but for all the noble and eminent citizens of the city as well" (Killerby, 2002, 87).

Figure 5: Illustrating the Effect of τ on Non-Monotonic Relationship Between Income and the Probability of a Sumptuary Law
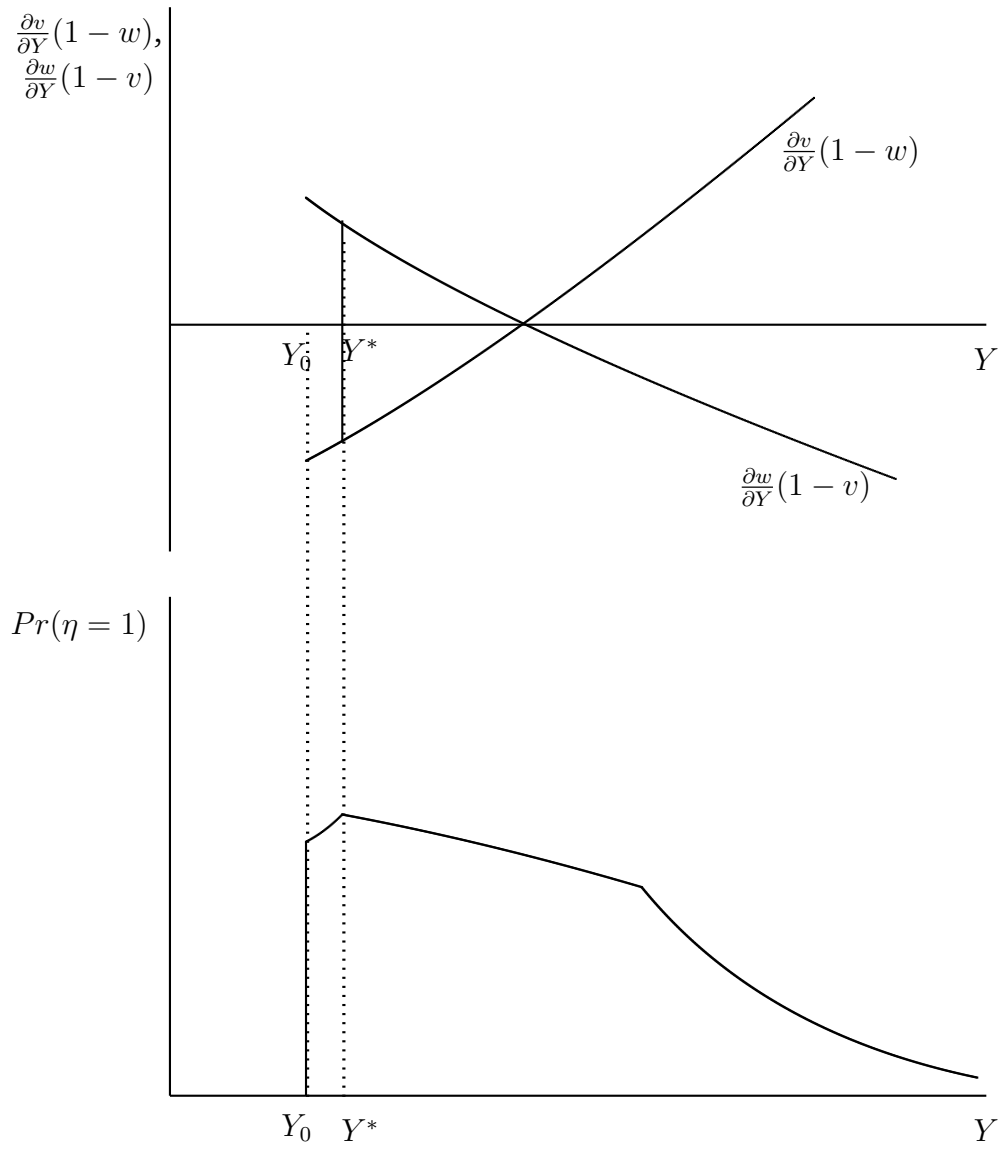
Table 3: The Effect of Plague Shocks on the Number of Sumptuary Laws: City-Level Panel Analysis by City Institutions

	Non-Despotic/Despotic		Number of Laws Commune/Non-Commune		Republican/Non-Republican	
	(1)	(2)	(3)	(4)	(5)	(6)
Plague	0.139***	0.0848	0.139***	-0.0124	0.0905**	0.0644***
	(0.0396)	(0.0501)	(0.0320)	(0.0529)	(0.0412)	(0.0184)
City FE	✓	✓	✓	✓	✓	✓
Decade FE	✓	✓	✓	✓	✓	✓
Geographic Controls*Decade FE	✓	✓	✓	✓	✓	✓
Institutional Controls*Decade FE	✓	✓	✓	✓	✓	✓
Observations	1368	393	1122	639	398	1363
Adjusted R^2	0.381	0.404	0.435	0.411	0.386	0.404

Table Notes: This table reports difference-in-differences~ estimates of the impact of the plague on the number of sumptuary laws by state type. The unit of observation is a city-decade. All specifications include city and decade fixed effects. Geographical controls include longitude, latitude, elevation, whether a city is on a river or the seas, and soil quality. Institutional controls include the presence of universities and bishoprics. Robust standard errors clustered at the city level are reported in brackets.

4.4 The Decline of Sumptuary Laws

Our city-level dataset does not extend beyond 1500. We are therefore unable to explore the decline in sumptuary laws at the city level. But qualitative evidence is consistent with Proposition 2 and suggests that increased evasion and enforcement costs can help to explain the decline in sumptuary laws after 1600.

Furthermore, we are able to investigate the relationship between sumptuary legislation and income in France in greater detail as Ridolfi (2019) provides yearly estimates of per capita GDP for the period 1280-1779. Figure 6a plots the number of sumptuary laws by decade against per capita GDP by decade. There is a clear inverted-U relationship consistent with Proposition 2 and with our country-level analysis. Figure 6b similarly reveals in an inverted-U shaped relationship between sumptuary laws and per capita income.

Sumptuary laws were the subject of lengthy debate in 18th century France and many factors contributed to their falling from fashion (Moyer, 1996).[16] Opponents of strict sumptuary laws like

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[16]Restrictions on luxury were justified on Physiocratic grounds—the view that agriculture was the source of all income, on the grounds of maximizing employment, on protectionist and balloonist grounds, on the grounds of reducing inequality, and of encouraging marriage and population growth. Numerous other authors put forward

Table 4: The Effect of Plague Shocks on the Number of Sumptuary Laws: City-Level Panel Analysis by City Characteristics

	Coastal/Non-Coastal		Number of Laws River/No River		Bishropic/No Bishopric	
	(1)	(2)	(3)	(4)	(5)	(6)
Plague	0.0979***	0.174***	0.142***	0.101***	0.144***	0.103***
	(0.0275)	(0.0472)	(0.0430)	(0.0321)	(0.0315)	(0.0310)
City FE	✓	✓	✓	✓	✓	✓
Decade FE	✓	✓	✓	✓	✓	✓
Geographic Controls*Decade FE		✓	✓			✓
Institutional Controls*Decade FE			✓			✓
Observations	1239	484	933	790	364	1359
Adjusted R^2	0.464	0.381	0.366	0.436	0.486	0.366

Table Notes: This table reports difference-in-differences poisson estimates of the impact of the plague on the number of sumptuary laws by city characteristic. The unit of observation is a city-decade. All specifications include city and decade fixed effects. Geographical controls include longitude, latitude, elevation, whether a city is on a river or the seas, and soil quality. Institutional controls include the presence of universities, bishoprics, and communes. Robust standard errors clustered at the city level are reported in brackets.

Jean Francois Melon argued that many so-called luxury goods such as sugar, tobacco and cheap silks were already widely available to the lower classes now. They further noted that enforcement was increasingly difficult as with a wider range of goods available "individuals ignored the spirit of the laws by substituting another type of luxury for the forbidden item" (quoted in Moyer, 1996, 355).

Over time, the French state had to invest more and more resources in enforcing sumptuary legislation. Moyer observes that "As the seventeenth century wore on, sumptuary law mandated more frequent searches of workshops and boutiques, usually by officers of the local police accompanied by guild *jurés*" (254). Inventories and records were also required to be kept by merchants to ensure that they were not selling prohibited products. Nevertheless, and despite these police measures, the "royal and municipal officials entrusted with sumptuary law execution were beset with problems" (Moyer, 1996, 255). More generally, Moyer concludes that "evasion was an increasing problem as the *ancien régime* wore on" (Moyer, 1996, 472). Attempts to restrict luxury consumption through taxation and regulation were revived during the French Revolution

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arguments for permitting luxuries and relaxing sumptuary legislation (Moyer, 1996).
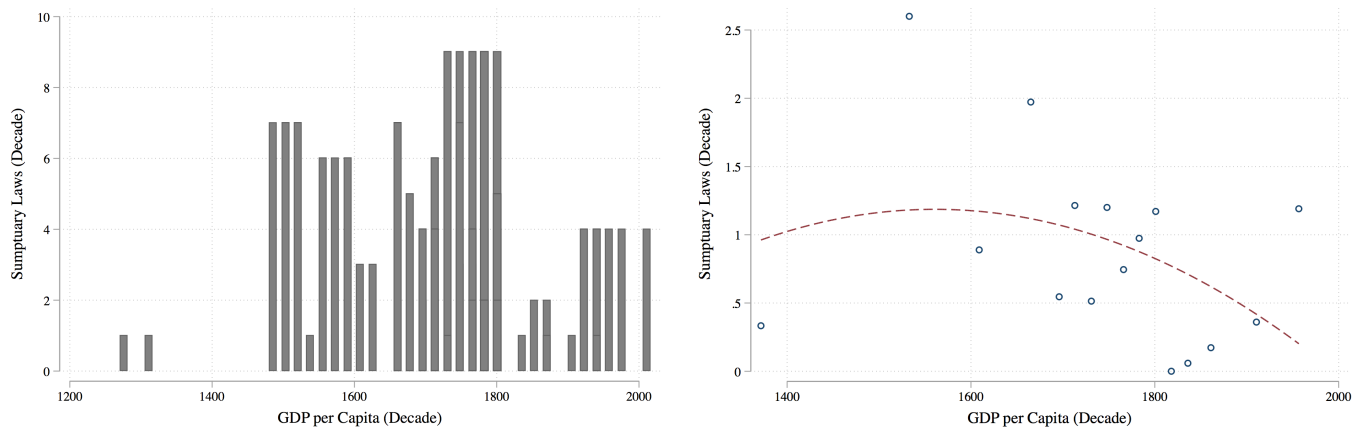
(a) French sumptuary laws (by decade) and GDP per capita.

(b) Binscatter of French sumptuary laws (by decade) and GDP per capita

Figure 6: French Sumptuary Laws and Per Capita GDP. Data described in Appendix 1.

these by and large failed to achieve their stated objectives.

With economic growth evasion became easier and enforcement more difficult. It became increasingly challenging to differentiate between those who were permitted to wear particular items of clothing from those who were not.[17] In the Middle Ages guilds played an important role in regulating economic activity (Ogilvie, 2019). They often cooperated with local authorities in the enforcement of sumptuary laws (Moyer, 1996). But after 1600, guilds went into decline, especially in Western Europe. As their hold on the economy weakened, it became harder to punish merchants or venders who violated sumptuary legislation. The gradual move from identity rules to more general rules in the early modern period discussed by Johnson and Koyama (2019) similarly made it more difficult and costly to enforce sumptuary legislation.

Similar concerns about evasion played an important role in the decline of sumptuary laws in England. The available evidence suggests that late medieval and early Tudor sumptuary laws were complied with (Doda, 2014, 183-184).[18] However, by the later part of the 16th century, concern with widespread evasion appears to have become more widespread, at least in the minds of legislators. Specifically, there was concern that economic developments were making luxury

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[17]Moyer notes that it became "difficult for officials to determine with any degree of certainty precisely who was legally entitled to wear illegal items" (Moyer, 1996, 257).

[18]For instance, "There were no overt violations of the sumptuary laws among the wills left by late medieval nobility . . . The early Tudor period wills and inventories reveal much of the same, and the solitary violation which Hayward notes appears to have been in error and not a violation at all" (Doda, 2014, 183).

consumption more available to the lower orders and that this was a source of social disorder. Enforcement costs were also a concern; it was possible to enforce sumptuary laws in London but more difficult to do so in the rest of the country (Hooper, 1915, 447).

Historians have argued that the consumer revolution of the early modern period made sumptuary laws increasingly difficult to enforce. By the late 17th century opportunities for luxury consumption could not easily be restricted to the elite (McKendrick et al., 1982; Brewer and Porter, 1993; de Vries, 2008; Koyama, 2012). In particular, opportunities for fashionable clothing rose with the emergence of retail shops, where individuals could purchase ready-made clothes, as opposed to purchasing whole cloth (Mui and Mui, 1989). The real cost of clothing also fell in this period (Shammas, 1990). By the 18th century Lemire (1991) observes even servants who could save up the "eight shillings for a ready-made gown" creating "a potentially vast market among working-women, for whom these prices meant perhaps one week's wages or less" (Lemire, 1991, 97). Consumer aspirations defused among the middle and lower classes from the late 17th century onwards (see the discussion in Styles, 2007).

5   Conclusion

Sumptuary laws restricted the consumption of individuals based on their social identity. We show in this paper how they can be rationalized as a means of restricting status competition. We introduce a model of sumptuary legislation, which generates several novel predictions into the evolution of sumptuary laws.

Our model generates a non-monotonic, inverted-U, relationship between per capita income and sumptuary legislation. When incomes are low, there is little surplus income to spend on status goods. As there is no status threat from below, elites do not have to enact costly sumptuary laws. As incomes rise, however, non-elites can spend more on status goods, obliging elites to also spend more. In this context, elites have an incentive to enact sumptuary laws in order to restrict the consumption of non-elites. As incomes rise still further, however, non-elites are better able to evade these laws. Elites moreover also benefit from economic growth and can spend more on status consumption. At a certain point, therefore, sumptuary laws cease to be worthwhile for elites.

The non-monotonic relationship between income and sumptuary laws is particularly steep for

states where elite rent-seeking is lower and more moderated than in states where the elites capture a larger share of income.

This framework can account for the otherwise puzzling rise and fall of sumptuary laws in premodern Europe. Empirically we document a non-monotonic, inverted-U, relationship between sumptuary laws and per capita GDP at the country level and at the city-level we provide casual evidence linking increased incomes for non-elites to sumptuary laws in Italy.

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Online Appendices (For Web Publication Only)

1   Data Appendix

A   Data on Historical GDP

We employ GDP per capita numbers from the Maddison project as reported in Bolt et al. (2018) where available. For the period before 1500, there is only partial coverage in the Maddison project database. We complement the Maddison project data with estimates reported in Fouquet and Broadberry (2015) and Broadberry et al. (2018). For Portugal we based GDP estimates on Henriques (2015) and on email correspondence with Nuno Palma. For the yearly estimates of French per capita GDP we use Ridolfi (2019).

B   Urbanization

The source of urbanization data is the Bairoch (1988) dataset as updated by Bosker et al. (2013).

C   Source for Country-Level Sumptuary Laws

England/Scotland   The main source for English sumptuary laws is Baldwin (1926). We also consult Hooper (1915). There is a distinction between legislation by Parliament and proclamations made by the king. Proclamations were legislative orders that the king could issue at his discretion and which were enforced in the Star Chamber (and not by common law courts). In addition to legislation, our dataset includes royal proclamations such as those issued by Elizabeth in 1559 and twice in1562. Elizabeth also issued proclaimations in 1574, 1577,1580, 1588 and 1597 (Benhamou, 1989).

France   The main source is Moyer (1996) who covers the period 1229–1806. For the period before 1229 we rely on other sources such as Hunt (1996). We also consult Harte (1976a).

Low Countries   We obtain information from Sturtewagen and Blonder (2019).

Italy   A comprehensive list of sumptuary laws in Italian city states is provided by Killerby (2002). We supplement this with information from Brundage (1987) and Hunt (1996). Sumptuary legislation in Florence is detailed by Rainey (1985).

Spain   For Spain the main source for sumptuary laws is Guarinos (1788). We also consulted Wunder (2019).

Portugal   We use Bethencourt (2019).

Sweden   Our source of information is Andersson (2019).

Holy Roman Empire   For obtaining and translating sources in Germany we are indebted to Josh Bedi. General information on sumptuary laws across the Holy Roman Empire is provided by Bulst (1988). A large amount of information for various German cities is listed in Eisenbart (1962). Mueller (1914) provides a history of sumptuary legislation in Isny. Information on the history of sumptuary legislation from Ravensburg is from Mueller (1924). Ulm is covered by Mollwo (1905). Keller-Drescher (2003) provides information on sumptuary laws in Wüttemberg, as does Schmidt-Funke (2018). Detailed information on sumptuary laws in Leonberg is provided by Landwehr (2000) who also includes information on sumptuary laws in Rostock and Stuttgart. Weber (2002) provides details on the major police ordinances at the Reich level in 1530, 1548, and 1577. We also consulted Zander-Seidel (1990), Kraß (2006), and Frieling (2013).

Switzerland   We use the numbers provided by Hunt (1996) which we verified and checked with other sources.

Russia   We use information in Riello and Rublack (2019).

Japan   The main source of data for sumptuary laws in Tokugawa Japan is Yunoki et al. (1929). We are indebted to Noboru Koyama for obtaining and coding this data for us.

2 Historical Appendix

In this appendix we provide additional discussion of different types of sumptuary legislation (Section A); the enforcement of sumptuary laws (Section B); mercantilist regulations (Section C); and sumptuary laws in Republican Rome, the Ottoman empire and Japan (section D). In Section E we provide additional evidence for the link between outbreaks of the bubonic plague, population, and real wages.

A Different Types of Sumptuary Legislation

In our main analysis we do not distinguish between different types of sumptuary legislation. The historical literature does note that the types of goods and the nature of sumptuary laws changed over time and varied from place to place.

Sumptuary laws in Italy and Germany were particularly focused on women's dress. Medieval English sumptuary laws, however, did not specifically refer to women's clothing. Sumptuary legislation in Renaissance Italy was also especially concerned with the extravagance of weddings and funerals.

Some sumptuary legislation was explicitly about maintaining existing status hierarchies The 1483 Act in England stated that "no man below the estate of lord shall wear plain cloth of gold". In 1510 this was expanded so that only those of baronial status of higher could wear "eny clothe of golde or clothe of Sylver or tynsen Satten [woven with fine metallic threads in the weft] ne no other Sylke or Clothe myxte or brodered with Golde or Sylver" (quoted in Doda, 2014).

B Enforcement

Where sumptuary laws enforced? Many historians have followed Voltaire in simply assuming that sumptuary laws *must* have been evaded and *cannot* have been seriously enforced. However, this would be perplexing. Why would rulers across Europe repeatedly pass laws that they had no ability or intention of enforcing? The idea that sumptuary legislation was frivolous or not intended serious is the result of modern misapprehensions. Nor is it in keeping with the actual evidence uncovered by researchers in the past thirty years. Recent research tends to concur that "to simply dismiss the laws as ineffective would be incorrect" (Mola and Riello, 2019, 239)

Sumptuary legislation often contained explicit provisions for enforcement. Fines were the most common punishment. Killerby (2002) notes that "All the Italian sumptuary laws of the thirteenth century, no matter how brief, have provisions for enforcement, and the methods specified are almost as various as they are numerous, which suggests that some thought went into their formulation". Fines were often complemented with excommunication. Violations of sumptuary laws were often handled by the podestà. In medieval Switzerland a court called the Chor-Gericht dealt with both sumptuary violations and marriages. Sumptuary laws restricting the size and extravagance of weddings required that notification be given days earlier with a list of invited guests. French sumptuary laws were designed to encourage denouncements by members of the public who received part of the fine as fee for informing (Moyer, 1996, 252). The male heads of household were often made responsible for the offenses of their wives and daughters. In Tudor England sumptuary legislation was often enforced by the Star Chamber. Early modern French sumptuary laws required notaries to report violations and police officers or judges who failed to enforce the law could also be punished (Moyer, 1996, 255).

Across Europe it was common for illicit or inappropriate clothes to be confiscated by the enforcement officers. Another punishment was losing one's employment. Vincent (2003, 17)

reports a case in 1591/92 in which a lawyer who appeared before the privy council wearing great ruffles and other clothes reserved for nobles was dismissed from office. In Italian city states men who did not pay fines for sumptuary law violations were often ineligible for public office (Killerby, 2002). Fines could be levied on producers as well as consumers (Mola and Riello, 2019, 220). In England violators could on occasion be pilloried. The harshest punishments were recorded in Venice were individuals could be imprisoned for sumptuary law violations, by up to 6 months in some instances.

Ogilvie (2010) provides evidence of sumptuary legislation being enforced in 17th and 18th century Germany. She notes that

> Sumptuary regulations were thus enforced at least sufficiently to provide an provide an instrument for "social disciplining". A unique documentary survival from the eighteenth century, suggests even more systematic enforcement. For the community of Wildberg, there survives a single booklet of "Polizei-Tax-Rechnungen" which lists all the clothing fines levied over a 12-month period between February 1713 and February 1714. Similar registers of clothing fines survive for other parts of Europe in the centuries, suggesting that such systematic was no unique to Württemberg ... Over a 12-month period, 110 individuals in a community of only about 1,300 inhabitants were fined for wearing forbidden garments, most of them small items or calico" (Ogilvie, 2010, 308).

Did these fines and other punishments work? The nature of the surviving evidence makes it difficult to assess how effective sumptuary laws were. Reports from contemporary chroniclers of widespread excess suggested to some earlier historians that sumptuary laws were widely violated. However, other sources of evidence suggest a different conclusion. Doda (2014) surveys recent work studying wills and inventories in late medieval and Tudor England. This suggests that sumptuary legislation was by and large obeyed: "Among the 160 wills left by late medieval artisans, Burkholder found only one example of a potential violation, in the ownership of a silk girdle" (Doda, 2014, 182).

C   Mercantilistic Regulations

In the early modern period there was a transition from sumptuary laws to mercantilistic laws that restricted the consumption of specific foreign apparels. We distinguish between sumptuary laws and mercantilistic laws in our dataset, only including the former in our analysis. Here we provide a more detailed account of how mercantilistic legislation arose in the 17th and 18th centuries.

By the late 17th century, France under Louis XIV tried to support the silk industry by banning printed cottons. The growth of these mercantilistic regulations amply documented by Heckscher (1955a,b) did not, however, mean an end to sumptuary legislation, as discussed by Moyer (1996).

In England, there ceased to be major acts of sumptuary legislation at the national level after 1603. Some local ordinances were issued in the first half of the 17th century but these petered out. Rather than sumptuary laws, the English state became preoccupied with laws aimed at supporting the English textile industry at the expense of foreign competitors. This tendency is exemplified by the Calico Acts.

In central Europe, sumptuary laws gradually evolved into a variety of luxury taxes. For example, in Bavaria a system of licensing for luxury goods was introduced in the 18th century: "Those who were caught with overly sumptuous clothes for which they had not bought a licence on paper were to be fined, while those offending more than twice could be publicly punished. This marks the beginning of a new regime of luxury fines, from which the nobility at court with their families as well as livery-wearing employees were exempt" (Rublack, 2019, 59). A

similar development can be traced in the Habsburg empire. The luxury patent of 1732 was the first to mention the explicitly mercantilistic goal of protecting the domestic luxury industry from foreign competition. In the assessment of Axtmann (1992, 55), the transformation from traditional sumptuary laws that aimed at maintaining existing status hierarchies to mercantilism reflected the "realization that economic and social developments had transformed society to such a degree that the traditional status order could not possibly be re-established by passing traditional sumptuary laws".

Elsewhere, as for example in Sweden, as sumptuary laws disappeared, there appeared laws ordering the wearing of a national custom (that was naturally manufactured in Sweden) (Freudenberger, 1963, 46). In Spain, the last general sumptuary law was passed in 1723. However, as Wunder (2019, 268) observes, "the Crown continued to issue new clothing laws and protectionist legislation regulating consumption by its subjects and their appearances throughout the eighteenth century". These laws were mercantilist in origin and prohibited the foreign imports while establishing "royal manufactories for silk, fine woollens, tapestries, porcelain, mirrors and glass, and other luxury goods. Spanish silk production — which had declined precipitously in the seventeenth century".

D   Sumptuary Laws Outside Europe

Sumptuary legislation was common across the premodern world. While our analysis focuses on Europe, our theory and conclusions should be generalizable. For purposes of external validity, here we discuss sumptuary legislation in ancient Rome, Tokugawa Japan and Qing China.

Republican Rome Sumptuary legislation first appears in Rome in the Twelve Tables (conventionally dated to the 5th century BCE). It concerned the funerals of the patrician nobility (Zanda, 2011). But it was not until Rome acquired an empire and became the centre of Mediterranean trade and commerce in the 2nd century BCE that luxury and sumptuary legislation more generally become prominent.

Following the defeat of Carthage and Rome's other major regional rivals, luxury came to be seen as a major threat to the social order. Historians view Rome sumptuary legislation as a means of regulating competition among the Roman empire. As Zanda (2011, 53) describes it:

> "...the senatorial class needed to put a brake on the expenditure and display of wealth and power. The lavish spending of one senator could have pushed the other members of the ruling class to do the same, putting their economic power at serious risk".

Dari-Mattiacci and Plisecka (2012, 7) in contrast develop a signaling game that explains the timing of sumptuary laws "as an attempt by part of the senatorial class to avoid an ever more competitive signaling game in which the benchmark was set by the emerging nouveaux riches". As Dari-Mattiacci and Plisecka (2012) discuss the expansion of Rome brought with it new sources of income such as long distance trade and tax farming which the equestrian class were often best positioned to exploit. According to their argument this induced wealthy senators to wish to prohibit signaling status via consumption.

The Roman experience is also entirely compatible with the model we present in Section 3. Sumptuary legislation was sporadic and unimportant when the level of commercial and economic activity was low. One commercialization and economic growth took place, however, elites came into competition with those below them on the social scale. One weapon at their disposal to respond to this to limit and regulate the consumption of luxury. At a certain point, however, as growth continued the costs of enforcing these laws increased and the elites were forced to liberalize
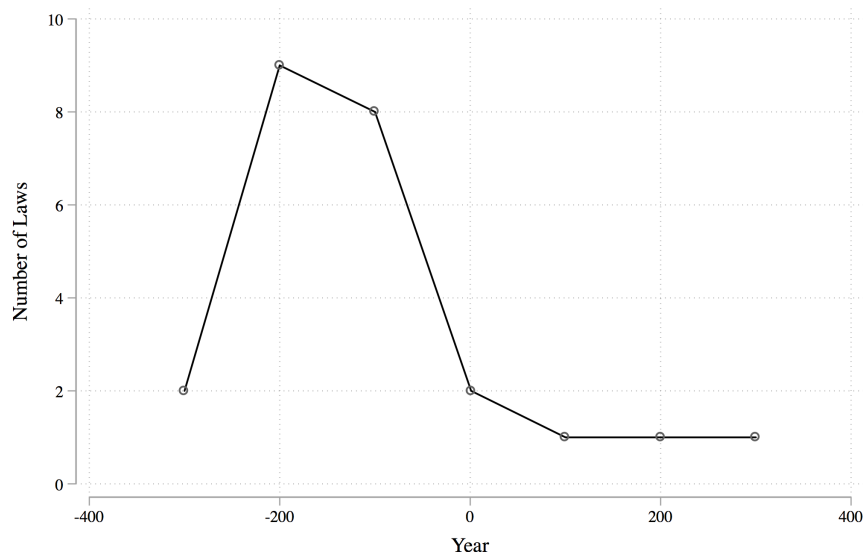
Figure A.1: Sumptuary Legislation in Rome 300 BCE–300 CE. Source: Hunt (1996).

luxury consumption (see Figure A.1. This occurred during the imperial period which is also when per capita income also likely peaked (Temin, 2006; Harper, 2017).

Tokugawa Japan   Like medieval and early modern Europe, premodern Japan was a hierarchical and status bound society. The Tokugawa settlement which ended more than a century of civil war institutionalized a rigid class system that distinguished samurai from farmers, artisans, and merchants (Shively, 1964b).

Following the establishment of peace, commerce grew and there was Smthinian economic growth (Crawcour, 1974). As Shively (1964b, 124) documents greater" affluence enabled the more fortunate merchants to enjoy a luxurious life which in the past had been reserved for their social superiors". This provoked a response from the state in the forms of sumptuary laws.

Tokugawa sumptuary laws increased in the late 17th century as a new culture of consumption took off. In the reign of Shogun Tsunayoshi (r. 1680–1709) the number of laws accelerated. Seven laws were passed in 1683 alone. Tokugawa sumptuary laws targeted the expense of weddings by daimyo (limited to ten horses and twenty standard bearers), the number of courses that could be served at banquets, the material that could be used in clothing (satin was banned for the hatamoto samurai), and the amount of money that could be spent on religious observance. These "proclamations should not be regarded merely as oddities. They were an integral part of the laws of the times, made with the serious intention of helping to preserve the social order upon which the political system was dependent" (Shively, 1964b, 155-156).

The laws were widely enforced and people could be jailed for violations, but as in Europe enforcement was costly and may have declined in effectiveness over time. Sumptuary laws were on occasion used for political purposes, for example, to justify expropriating the wealth of particular merchant families (Shively, 1964b, 133). These laws were maintained until the end of the Tokugawa period and the Meiji Restoration.

By 1830 the Japanese economy had become so weakened by the profligacy of the middle classes that the strongest sumptuary laws of all time were promulgated. Silk in any form for the

population at large was barred, and the only decoration that was allowed for cotton and hemp kimono was a touch of resist-dyeing on the front lower corners or a narrow lower border of dyed patterning with tiny accents of embroidery or painted details.

We use data from Yunoki et al. (1929) to plot the number of sumptuary laws passed by the Tokugawa authorities between 1600 and 1868. The number of laws increased during the 17th and 18th centuries and in the early and mid-19 century, consistent with the narrative outlined above. Following the Meiji Restoration all sumptuary legislation ceased. A high proportion of the laws were aimed at regulating the spending of samurai. There were also laws that aimed at controlling spending by merchants and farmers.

The Ottoman Empire   Sumptuary laws were widespread in the Ottoman Empire. These laws both distinguished between the dress permitted to different religious minorities and that allowed for members of different social classes. Laws restricting the dress of non-Muslims date to the time of the original Arab conquests.

Christians and Jews, who had *dhimmi* status were only allowed clothes of certain colors—specifically black or blue, nor could they bear arms, ride hoses, or wear silk or satin. Only Muslims could wear green or yellow (Dunn, 2011, 91). Muslims avoided blue so as not to be mistaken for Christians. Members of military and civil hierarchy were permitted specific forms of dress and headgear.

Few sumptuary laws were passed in the 17th century. The number of sumptuary laws then accelerated after 1720 (Quataert, 1997). Whereas sumptuary laws declined and more or less disappeared in Europe during the 18th century, in the Ottoman Empire they continued in full force Zifli (2019). The number of sumptuary laws and the severity of their enforcement increased during the reigns of Osman III (r. 1754-57), Mustafa III (1757-1774) and Selim III (r. 1789-1807). Quataert (1997, 410) comments that

> "The brief reign of Sultan Osman III, who ascended the throne when was nearly 56, was noteworthy for little else than his extraordinary concern about the sartorial displays of his subjects. In his few years on the throne, this sultan vigilantly prowled the streets of Istanbul in disguise, haranguing men and women for their clothing improprieties".

As we noted in the many text, individuals were on occasion executed in the Ottoman empire for violating sumptuary laws including a Christian beggar wearing yellow slippers that he had been given by a charitable Muslim.

Traditional Ottoman sumptuary laws were abolished in 1829 as part of widespread reforms that followed from the destruction of the janissary corp and which saw major fiscal and administrative centralization (Quataert, 1997). The headgear previously reserved for Ottoman empire were abolished in the favor of the fez. This can be seen as an attempt by the state to limit status competition by various groups in society. Non-Muslims benefit as they were able to escape discrimination. Nevertheless, historians argue that these reforms largely failed. The population were able to innovate and adopt more decorative variants of the plain fez in order to demonstrate their social status.

E   Rising Real Wages and Distributional Changes Following the Black Death

Our empirical exercise in Section 4 exploits plague shocks following the Black Death. In this section we present additional discussion of how episodes of the plague affected labor markets and incomes in late medieval Europe.
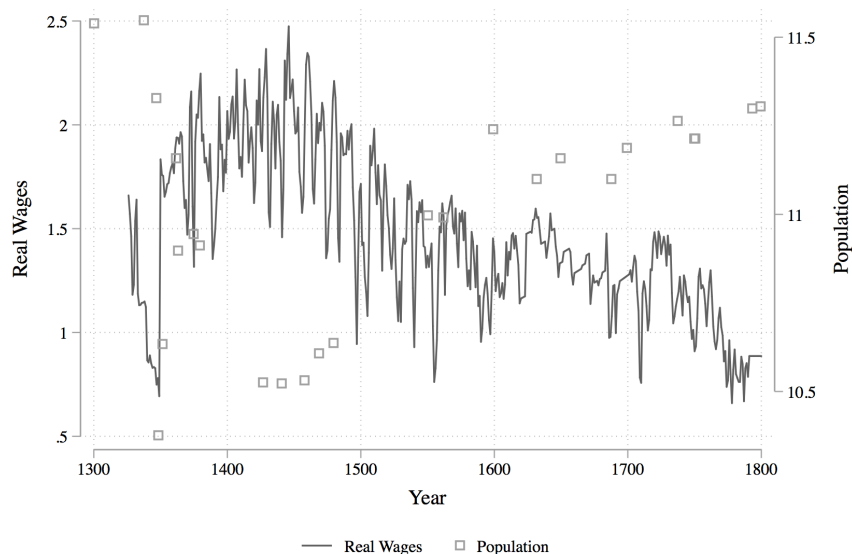
Figure A.2: Real Wages and Population in Florence

Prior to the outbreak of the Black Death in 1348, bubonic plague had been absent in Europe for centuries. The Black Death itself had a dramatic impact on population: estimates of the death toll range from 1/3 to over 1/2 of the total population. These loses were particularly high in Italy, parts of France, and England and somewhat lower in central and eastern Europe (Benedictow, 2005). As the medieval economy was broadly Malthusian, the fall in population led to a rise in per capita incomes and real wages (Ashraf and Galor, 2011). There was considerable variation in the intensity of the plague shock at the city-level (Jedwab et al., 2019).

Following the initial outbreak of the Black Death, bubonic plague returned periodically (Biraben, 1975; Alfani and Murphy, 2017). Unlike the initial outbreak which spread across Europe like a wave, late episodes of plague were localized. Infections often sprung from local plague spores. The timing of plague outbreaks appears to have been random and uncorrelated with observable city characteristics (see Dittmar and Meisenzahl, 2018). We can therefore use plague shocks as exogenous proxies for upwards pressure on wages and per capita income.

Real wage data for the late medieval period remains scarce. In Figure A.2 we depict real wage data against population data from Allen (2001); Fochesato (2018) for Florence. There is a clear inverse relationship: as population pressure eased, real wages rose.

Qualitative evidence provided by historians also supports that contention that the plague had a major impact on the incomes of non-elites. Pamuk (2007, 292) observes that:

> "Even a cursory look at real wage series makes clear that modern economic growth and the Black Death are the two events that led to the most significant changes in wages and incomes during the last millennium".

Describing England, Dyer observes the conditions of relative labor scarcity benefited workers including both craftsmen and rural workers (Dyer, 2005, 130). He concludes that:

> "The total number of consumers had halved during the fourteenth century, from 5–6 million to 2.5 million, but as each household could afford to buy more goods, global consumption fell by much less than a half, and in cases such as meat or cloth the total

may well have increased. A reduced number of traders and artisans were kept busy supplying the demand, and their in- creased workload brought them higher incomes" (Dyer, 2005, 132).

In line with our model, as per capita incomes rose, non-elites began to spend an increasing share of their additional incomes on status goods:

> "Chaucer, with characteristic irony, described urban artisans, a carpenter, weaver, and dyer whose knife scabbards were trimmed with chapes made from silver, not brass, and who wore high-quality girdles and pouches; their wives lived in the hope of being addressed as 'madam?' if the husband should become an alderman" (Dyer, 2005, 133).

This represented a status threat to elites. Dyer notes that

> The elite responded by making moves to differentiate themselves from the aspiring lower orders. For example, before 1400 the fur most commonly worn was that of squirrels from northern Europe. By the fifteenth century, however, artisans' wives were acquiring garments lined with squirrel skins. As that type of fur, therefore, lost its exclusive status, it was worn less often by the royal court and the upper classes in general. The wealthiest consumers opted for extremely luxurious sable and marten fur, which no artisan could possibly afford (Dyer, 2005, 134).

This approach was costly however. Therefore an alternative response to the status threat posed by non-elites was sumptuary legislation.

3 Empirical Appendix

Table A.1 reports the summary statistics for our country-level analysis. Table A.2 reports the summary statistics for our city-level panel analysis.

In Table A.3 we explore whether the impact of plagues on sumptuary legislation varies depending on the lag structure that we employ. Column (1) reports our baseline estimates using the sum of the number of plagues in the previous two decades. In column (2) we consider just the number of plagues in the preceding decade. In column (3) we report results using the three previous decades. In column (4) we separately report the effect of each past decade on sumptuary legislation.

In Table A.4 we report our main results when we correct our standard errors to allow for spatial autocorrelation. We first vary the radius of our Conley standard errors from 100 to 500km. Then we increase the number of spatial lags to 5. In general, the adjusted standard errors, do not change greatly.

In Table A.5 we vary the sample in a number of ways. First we exclude the largest cities in our sample. Next we sequentially exclude cities in Sicily, Northern Italy, Southern Italy, cities on the cost, on rivers, above mean elevation, on Roman road intersections, cities with universities. Finally we exclude both large and small cities. In general the size of the effect of the plague on sumptuary legislation remains robust even as the sample changes.

Table A.1: Summary Statistics for Country-Level Analysis

Variable	Mean	S.D.	Min	Max
Sumptuary Laws	6.435115	19.18016	0	160
GDP Per Capita	1167.561	487.7654	400	2718
GDP Per Capita^2	1598212	1453399	160000	7387524
Ruggedness	1.409806	1.330451	.0365031	4.761175
Protestant 1600	0.0503145	0.2192837	0	1
Coast to Area Ratio	0.0093147	0.0135582	0	0.0514445
Constraints on the Executive	2.006289	1.420897	1	7
Wars Per Year	0.4138406	0.4710871	0	2.22

Table A.2: Summary Statistics for City-Level Panel

Variable	Mean	S.D.	Min	Max
Sumptuary Laws	.3088343	.6781403	0	7
Sum Plague	1.414123	1.372453	0	9
Latitude	41.92462	2.873218	36.867	46.33
Longitude	12.80963	2.69684	7.43	18.5
Elevation (m)	183.3137	183.8377	0	775
Sea	0.2361111	0.4247388	0	1
River	.2569444	0.4369975	0	1
Bishop	0.5486111	0.4976871	0	1
Archbishop	0.0902778	0.2866114	0	1
Population	-1283.265	8320.229	-72160	18231.82
Free/Prince	0.4444444	0.4969597	0	1
University	0.0763889	0.2656491	0	1
Soil Quality	0.8051293	0.1817445	0.42359	0.998
Commune	0.3125	0.4635643	0	1
Despotism	0.0852273	0.2792452	0	1
Republican	0.1008065	0.3010999	0	1

Table A.3: The Effect of Plague Shocks on the Number of Sumptuary Laws: City-Level Panel: Exploring the Lag Structure

	Number of Laws			
	(1)	(2)	(3)	(4)
Sum Plague	0.134***	0.167**	0.0902***	
	(0.0344)	(0.0683)	(0.0252)	
Plague$_{d-1}$				0.135**
				(0.0635)
Plague$_{d-2}$				0.117
				(0.0758)
Plague$_{d-3}$				0.205***
				(0.0585)
Sum Plague =	$\sum_{j=1}^{2} P_{d-j}$	$\sum_{j=1}^{1} P_{d-j}$	$\sum_{j=1}^{3} P_{d-j}$	
Geography Controls × FE	✓	✓	✓	✓
Institutional Controls × Year FE	✓	✓	✓	✓
City FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Observations	1761	4176	1739	4032
Adjusted R^2	0.384	0.426	0.378	0.424

Table Notes: This table reports difference-in-differences poisson estimates of the impact of the plague where we vary the lag structure. Column (1) reports our baseline estimate (replicating Table 2, Col. (3)). In Column (1) we use as our explanatory variable whether there was a plague in previous decade. Column (3) uses the sum of plagues in the prior three decades. In Column (4) we separately report the coefficient on a plague one, two, and three decades prior respectively. In all other respects, the table replicates the specification reported in Table 2, Col. (3).

Table A.4: The Effect of Plague Shocks on the Number of Sumptuary Laws: City-Level Panel Analysis: Spatial Autocorrelation

	Number of Laws					
	(1)	(2)	(3)	(4)	(5)	(6)
Plague	0.143***	0.143***	0.143***	0.143***	0.143***	0.143***
	(0.0302)	(0.0378)	(0.0411)	(0.0302)	(0.0378)	(0.0411)
Radius	100	250	500	100	250	500
N. of Lags	1	1	1	5	5	5
Geography Controls × FE	✓	✓	✓	✓	✓	✓
Institutional Controls × Year FE	✓	✓	✓	✓	✓	✓
City FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Observations	1761	1761	1761	1761	1761	1761
Adjusted R^2	0.618	0.618	0.618	0.618	0.618	0.618

Table Notes: This table reports difference-in-differences poisson estimates of the impact of the plague using Conley standard errors to correct for possible spatial autocorrelation. In Columns (1)-(3) we vary the radius of our Conley standard errors from 100 to 500km. In columns (4)-(6) we increase the number of spatial lags to 5. In general, the adjusted standard errors we obtain change very little.

Table A.5: The Effect of Plague Shocks on the Number of Sumptuary Laws: City-Level Panel Robustness

Excluding		L. Cities	Sicily	Number of Laws N. Cities	S.Cities	Coastal Cities
	(1)	(2)	(3)	(4)	(5)	(6)
Plague	0.134***	0.0717***	0.138***	0.0954***	0.149***	0.0979***
	(0.0344)	(0.0188)	(0.0350)	(0.0295)	(0.0358)	(0.0277)
City FE	✓	✓	✓	✓	✓	✓
Decade FE	✓	✓	✓	✓	✓	✓
Geographic Controls*Decade FE	✓	✓	✓	✓	✓	✓
Institutional Controls*Decade FE	✓	✓	✓	✓	✓	✓
Observations	1761	1668	1566	451	1310	1271
Adjusted R^2	0.384	0.404	0.478	0.485	0.447	0.455
Excluding	Riverine Cities	Elevation >mean	Roman Road Hubs	University Cities	Pop 1300 > 50k	Pop 1300 < 50k
	(7)	(8)	(9)	(10)	(11)	(12)
Plague	0.142***	0.144***	0.145***	0.152***	0.122***	0.134**
	(0.0434)	(0.0359)	(0.0354)	(0.0393)	(0.0369)	(0.0582)
City FE	✓	✓	✓	✓	✓	✓
Decade FE	✓	✓	✓	✓	✓	✓
Geographic Controls*Decade FE	✓	✓	✓	✓	✓	✓
Institutional Controls*Decade FE	✓	✓	✓	✓	✓	✓
Observations	966	1433	1213	1455	1307	437
Adjusted R^2	0.349	0.389	0.392	0.360	0.402	0.338

Table Notes: This table reports our main robustness checks for our city-level analysis. The unit of observation is a city-decade. All specifications include city and decade fixed effects. Geographical controls include longitude, latitude, elevation, whether a city is on a river or the seas, and soil quality. Institutional controls include the presence of universities, bishoprics, and communes. Column (1) reports our baseline estimates. The largest cities excluded in column (2) are Venice, Florence, and Milan. In column (3), northern cities are those above 41.9028 (the latitude of Rome). In column (8) we exclude cities with elevation greater than 183 meters. Robust standard errors clustered at the city level are reported in brackets.

4 Model Appendix

A Proof of Proposition 1

Proof. To prove Proposition 1, we use the following optimal values of (x_i, l_i) chosen by player $i \in \{E, B\}$, the optimal value of $\bar{l}_B$ chosen by E, and the indirect utility function U_i obtained by i, under cases a, b, c, d, e, f:

$$
\begin{aligned}
U_{B,a} &= u(x_{B,a}, (l_{B,a} - l_{E,a})) \\
U_{B,b} &= u(x_{B,b}, (l_{B,b} - l_{E,b})) \\
U_{B,c} &= u(x_{B,c}, (l_{B,c} - l_{E,c})) \\
U_{B,d} &= u(x_{B,d}, (l_{B,d} - l_{E,d})) \\
U_{B,e} &= u(x_{B,e}, (l_{B,e} - l_{E,e})) \\
U_{B,f} &= u(x_{B,f}, (l_{B,f} - l_{E,f}))
\end{aligned}
$$

$$
\begin{aligned}
U_{E,a} &= u(x_{E,a}, (l_{E,a} - l_{B,a})) \\
U_{E,b} &= u(x_{E,b}, (l_{E,b} - l_{B,b})) \\
U_{E,c} &= u(x_{E,c}, (l_{E,c} - l_{B,c})) \\
U_{E,d} &= u(x_{E,d}, (l_{E,d} - l_{B,d})) \\
U_{E,e} &= u(x_{E,e}, (l_{E,e} - l_{B,e})) \\
U_{E,f} &= u(x_{E,f}, (l_{E,f} - l_{B,f}))
\end{aligned}
$$

where

$$
\begin{aligned}
(x_{B,a}, l_{B,a}) &= (x_{B,a}, 0) \\
x_{B,a} &= \arg\max_{x_B} u(x_B) \\
&\qquad \textbf{s.t.}(1-\tau)Y^L = x_B \\
(x_{B,b}, l_{B,b}) &= \arg\max_{x_B, l_B} u(x_B, (l_B - l_E)) \\
&\qquad \textbf{s.t.}(1-\tau)Y^H = x_B + \rho l_B \; ; \\
(x_{B,c}, l_{B,c}) &= (x_{B,c}, 0) \\
x_{B,c} &= \arg\max_{x_B} u(x_B) \\
&\qquad \textbf{s.t.}(1-\tau)Y^L = x_B \\
(x_{B,d}, l_{B,d}) &= \arg\max_{x_B, l_B} u(x_B, (l_B - l_E)) \\
&\qquad \textbf{s.t.}(1-\tau)Y^H = x_B + \rho l_B \; ; \\
&\qquad l_B \leq \bar{l}_B \\
(x_{B,e}, l_{B,e}) &= (x_{B,e}, 0) \\
x_{B,e} &= \arg\max_{x_B} u(x_B) \\
&\qquad \textbf{s.t.}(1-\tau)Y^L = x_B \\
(x_{B,f}, l_{B,f}) &= \arg\max_{x_B, l_B} u(x_B, (l_B - l_E)) \\
&\qquad \textbf{s.t.}(1-\tau)Y^H = x_B + \rho l_B + \theta(\cdot)F(\cdot) \; ; \\
&\qquad l_B > \bar{l}_B
\end{aligned}
$$

$$
\begin{aligned}
(x_{E,a}, l_{E,a}) &= (x_{E,a}, 0) \\
x_{E,a} &= \arg\max_{x_E} u(x_E) \\
&\text{s.t. } \tau Y^L = x_E \\
(x_{E,b}, l_{E,b}) &= \arg\max_{x_E, l_E} u(x_E, (l_E - l_B)) \\
&\text{s.t. } \tau Y^H = x_E + \rho l_E \\
(x_{E,c}, l_{E,c}, \bar{l}_{B,c}) &= (x_{E,c}, 0, L) \\
x_{E,c} &= \arg\max_{x_E} u(x_E) \\
&\text{s.t. } \tau Y^L = x_E + \rho l_E + C_F(\cdot) \\
(x_{E,d}, l_{E,d}, \bar{l}_{B,d}) &= \arg\max_{x_E, l_E, \bar{l}_B} u(x_E, (l_E - l_B)) \\
&\text{s.t. } \tau Y^H = x_E + \rho l_E + C_F(\cdot) \\
(x_{E,e}, l_{E,e}, \bar{l}_{B,e}) &= (x_{E,e}, 0, L) \\
x_{E,e} &= \arg\max_{x_E} u(x_E) \\
&\text{s.t. } \tau Y^L = x_E + \rho l_E + C_F(\cdot) + C(\cdot) \\
(x_{E,f}, l_{E,f}, \bar{l}_{B,f}) &= \arg\max_{x_E, l_E, \bar{l}_B} u(x_E, (l_E - l_B)) \\
&\text{s.t. } \tau Y^H = x_E + \rho l_E + C_F(\cdot) + C(\cdot)
\end{aligned}
$$

We first prove (13), then (12), then (14) and (15).

To prove (13), we show that the equilibrium value of ω depends on $U_{B,d}$ $U_{B,f}$. Recall that the game starts in state Y^L. Thus, given $\eta = 1$, B chooses $\omega = 1$ over $\omega = 0$ if $V_c^B \geq V_e^B$ or

$$
\frac{(1-\beta)U_{B,c} + \beta q U_{B,d}}{(1-\beta)[1 - \beta(1-q)]} \geq \frac{(1-\beta)U_{B,e} + \beta q U_{B,f}}{(1-\beta)[1 - \beta(1-q)]} \, .
$$

Simplifying this condition yields:

$$
(1-\beta)(U_{B,c} - U_{B,e}) \geq \beta q (U_{B,f} - U_{B,d}).
$$

Since $U_{B,c} = U_{B,e}$, the condition reduces to $U_{B,d} \geq U_{B,f}$.

To prove (12), we move backwards in the game. If $\omega = 0$, E chooses $\eta = 1$ over $\eta = 0$ if $V_e^E \geq V_a^E$, or:

$$
\frac{(1-\beta)U_{E,e} + \beta q U_{E,f}}{(1-\beta)[1 - \beta(1-q)]} \geq \frac{(1-\beta)U_{E,a} + \beta q U_{E,b}}{(1-\beta)[1 - \beta(1-q)]}
$$

Simplifying gives:

$$
(1-\beta)(U_{E,e} - U_{E,a}) \geq \beta q (U_{E,b} - U_{E,f})
$$

Since $l_{B,e} = 0$ and $\bar{l}_{B,e} = L$, then $C_F(\cdot) = 0$ and $C(\cdot) = 0$. Thus, $U_{E,a} = U_{E,e}$, and the condition reduces to $U_{E,f} \geq U_{E,b}$.

Now if $\omega = 1$, E chooses $\eta = 1$ over $\eta = 0$ if $V_c^E \geq V_a^E$, or

$$
\frac{(1-\beta)U_{E,C} + \beta q U_{E_{E,d,}}}{(1-\beta)[1 - \beta(1-q)]} > \frac{(1-\beta)U_{E,a} + \beta q U_{E,b}}{(1-\beta)[1 - \beta(1-q)]}
$$

Simplifying gives
$$(1 - \beta)(U_{E,c} - U_{E,a}) \geq \beta q(U_{E,b} - U_{E,d})$$
Since $l_{B,c} = 0$ and $\bar{l}_{B,c} = L$, then $C_F(\cdot) = 0$. Thus, $U_{E,c} = U_{E,a}$, and the condition reduces to $U_{E,d} \geq U_{E,b}$.

To summarize, if $\omega = 0$, then E would choose:

$$\eta = \begin{cases} 1 & \text{if } U_{E,f} \geq U_{E,b} \\ 0 & \text{if } U_{E,f} < U_{E,b} \end{cases}$$

If $\omega = 1$, then E would choose:

$$\eta = \begin{cases} 1 & \text{if } U_{E,d} \geq U_{E,b} \\ 0 & \text{if } U_{E,d} < U_{E,b} \end{cases}$$

Now, by Conjecture 1 (below), $U_{E,f} \leq U_{E,d}$. This implies three cases: (a) $U_{E,f} \leq U_{E,d} < U_{E,b} \rightarrow \eta = 0$; (b) $U_{E,b} \leq U_{E,f} \leq U_{E,d} \rightarrow \eta = 1$; (c) $U_{E,f} < U_{E,b} \leq U_{E,d} \rightarrow \eta = 1$ if $\omega = 1$ (which in turn requires $U_{B,d} \geq U_{B,f}$) and $\eta = 0$ if $\omega = 0$ (which requires $U_{B,d} < U_{B,f}$) or, summarizing:

$$\eta = \begin{cases} 1 & \text{if } U_{E,b} \leq U_{E,f} < U_{E,d} \\ & \text{or } U_{E,f} < U_{E,b} \leq U_{E,d} \text{ and } U_{B,d} \geq U_{B,f} \\ 0 & \text{if } U_{E,f} < U_{E,d} < U_{E,b} \\ & \text{or } U_{E,f} < U_{E,b} \leq U_{E,d} \text{ and } U_{B,d} < U_{B,f} \end{cases}$$

This can be reduced to:

$$\eta^* = \begin{cases} 1 & \text{if } U_{E,f} \geq U_{E,b} \\ & \text{or } U_{E,f} < U_{E,b} \text{ and } U_{B,d} \geq U_{B,f} \\ 0 & \text{if } U_{E,f} < U_{E,b} \text{ and } U_{B,d} < U_{B,f} \end{cases}$$

Finally, to prove (14) and (15), note that (x_B^*, l_B^*) is the bundle that maximizes B's one-period utility. Since by (13), B can only obtain either $U_{B,d}$ or $U_{B,f}$ in equilibrium, then $(x_B^*, l_B^*) = (x_{B,d}, l_{B,d})$ if $U_{B,d} \geq U_{B,f}$ and $(x_B^*, l_B^*) = (x_{B,f}, l_{B,f})$ otherwise. An analogous reasoning proves the equilibrium values of $(x_E^*, l_E^*, \bar{l}_B^*)$. $\square$

B Conjecture 1

$$U_{E,f} \leq U_{E,d}$$

Conjecture 1 formally states that the utility that ruling elites would obtain in a period in which sumptuary laws are obeyed (case d) would be no less than the utility they would obtain if such laws were disobeyed (case f).

C   Proof of Proposition 2

Differentiating equation (16) with respect to Y gives $\frac{\partial v}{\partial Y}(1-w) + \frac{\partial w}{\partial Y}(1-v)$ which, when greater (less) than zero implies that $\frac{\partial Pr(\eta=1)}{\partial Y}$ is greater (less) than zero. Equivalently:

$$\frac{\partial Pr(\eta=1)}{\partial Y} \gtrless 0 \Longleftrightarrow \frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y} \lessgtr \frac{1-v}{1-w}.$$

Assuming that (a) the minimum value Y_0 that Y^H can take is such that $\frac{\partial v}{\partial Y_0}/\frac{\partial w}{\partial Y_0} < \frac{1-v}{1-w}$, then as Y increases, the $\frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y}$ curve will eventually cross the $\frac{1-v}{1-w}$ curve if the rate at which the former increases with Y is higher than the rate at which the latter increases with Y. That is, if (assumption (b))

$$\frac{\partial[\frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y}]}{\partial Y} > \frac{\partial[\frac{1-v}{1-w}]}{\partial Y},$$

then there is a value $Y^* > Y_0$ such that as Y increases, when $Y^L < Y < Y^*$, then $\frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y} < \frac{1-v}{1-w}$, which implies $\frac{\partial Pr(\eta=1)}{\partial Y} > 0$, and when $Y^L < Y^* < Y$, then $\frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y} > \frac{1-v}{1-w}$, which implies $\frac{\partial Pr(\eta=1)}{\partial Y} < 0$.

It is useful to prove that $\frac{\partial v}{\partial Y}, \frac{\partial w}{\partial Y} \neq 0$, and $\frac{\partial[\frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y}]}{\partial Y} \neq 0$, in order to show that assumptions (a) and (b) are possible.

We derive $\frac{\partial v}{\partial Y}$ and $\frac{\partial w}{\partial Y}$. First note that $\frac{\partial v}{\partial Y} = G'(\frac{\partial U_{E,f}}{\partial Y} - \frac{\partial U_{E,b}}{\partial Y})$, and $\frac{\partial w}{\partial Y} = G'(\frac{\partial U_{B,d}}{\partial Y} - \frac{\partial U_{B,f}}{\partial Y})$, where G' is a probability density function. Thus, $\frac{\partial v}{\partial Y} \neq 0 \leftrightarrow (\frac{\partial U_{E,f}}{\partial Y} - \frac{\partial U_{E,b}}{\partial Y}) \neq 0$ and $\frac{\partial w}{\partial Y} \neq 0 \leftrightarrow (\frac{\partial U_{B,d}}{\partial Y} - \frac{\partial U_{B,f}}{\partial Y}) \neq 0$.

To get an expression for $\frac{\partial U_{E,f}}{\partial Y}$, we use the ruling elites' budget constraint under case f to get $x_{E,f} = \tau Y - \rho l_{E,f} - C_{F,f} - C_f$ (where we have suppressed superscript H in Y^H) which, when plugged into the indirect utility function gives $U_{E,f} = u((\tau Y - \rho l_{E,f} - C_{F,f} - C_f), (l_{E,f} - l_{B,f}))$. Differentiating this with respect to Y gives

$$\frac{\partial U_{E,f}}{\partial Y} = \frac{\partial u}{\partial(\tau Y - \rho l_{E,f} - C_{F,f} - C_f)} \cdot (\tau - \rho\frac{\partial l_{E,f}}{\partial Y} - \frac{\partial C_{F,f}}{\partial Y} - \frac{\partial C_f}{\partial Y})$$
$$+ \frac{\partial u}{\partial(l_{E,f} - l_{B,f})} \cdot (\frac{\partial l_{E,f}}{\partial Y} - \frac{\partial l_{B,f}}{\partial Y}).$$

Analogously, we get the following under case (b)

$$\frac{\partial U_{E,b}}{\partial Y} = \frac{\partial u}{\partial(\tau Y - \rho l_{E,b})} \cdot (\tau - \rho\frac{\partial l_{E,b}}{\partial Y})$$
$$+ \frac{\partial u}{\partial(l_{E,b} - l_{B,b})} \cdot (\frac{\partial l_{E,b}}{\partial Y} - \frac{\partial l_{B,b}}{\partial Y}).$$

Thus, to the extent that $\frac{\partial U_{E,f}}{\partial Y} \neq \frac{\partial U_{E,b}}{\partial Y}$, then $\frac{\partial v}{\partial Y} \neq 0$.

To show that $\frac{\partial w}{\partial Y} \neq 0$, we derive $\frac{\partial U_{B,d}}{\partial Y}$ and $\frac{\partial U_{B,f}}{\partial Y}$ in the same manner:

$$
\begin{aligned}
\frac{\partial U_{B,d}}{\partial Y} &= \frac{\partial u}{\partial((1-\tau)Y - \rho l_{B,d})} \cdot ((1-\tau) - \rho \frac{\partial l_{B,d}}{\partial Y}) \\
&+ \frac{\partial u}{\partial(l_{B,d} - l_{E,d})} \cdot (\frac{\partial l_{B,d}}{\partial Y} - \frac{\partial l_{E,d}}{\partial Y}). \\
\frac{\partial U_{B,f}}{\partial Y} &= \frac{\partial u}{\partial((1-\tau)Y - \rho l_{B,f} - \theta F)} \cdot ((1-\tau) - \rho \frac{\partial l_{B,f}}{\partial Y} - \theta \frac{\partial F}{\partial Y} - \frac{\partial \theta}{\partial Y} F) \\
&+ \frac{\partial u}{\partial(l_{B,f} - l_{E,f})} \cdot (\frac{\partial l_{B,f}}{\partial Y} - \frac{\partial l_{E,f}}{\partial Y}).
\end{aligned}
$$

To the extent that $\frac{\partial U_{B,d}}{\partial Y} \neq \frac{\partial U_{B,f}}{\partial Y}$, then $\frac{\partial w}{\partial Y} \neq 0$.

Lastly, we prove that $\frac{\partial[\frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y}]}{\partial Y} \neq 0$ by showing that $\frac{\partial \frac{\partial v}{\partial Y}}{\partial Y}, \frac{\partial \frac{\partial v}{\partial Y}}{\partial Y} \neq 0$.[19] Note that $\frac{\partial\left(\frac{\partial v}{\partial Y}\right)}{\partial Y} = G' \frac{\partial\left[\frac{\partial U_{E,f}}{\partial Y} - \frac{\partial U_{E,b}}{\partial Y}\right]}{\partial Y} \neq 0$, since $\frac{\partial U_{E,f}}{\partial Y} \neq \frac{\partial U_{E,b}}{\partial Y}$ and, for non-homothetic preferences over x and $(l_i - l_{-i})$, $\frac{\partial \frac{\partial U_{E,f}}{\partial Y}}{\partial Y}, \frac{\partial \frac{\partial U_{E,b}}{\partial Y}}{\partial Y} \neq 0$. For the same reasons, $\frac{\partial\left(\frac{\partial w}{\partial Y}\right)}{\partial Y} \neq 0$.

D Proof of Proposition 3

Assumption (a) in Proposition 2 implies that the initial rise in $Pr(\eta = 1)$ is more likely when $\frac{\partial v}{\partial Y}$ is large and $\frac{\partial w}{\partial Y}$ is small. For ease of notation, let $\alpha \equiv \frac{\partial v}{\partial Y}$ and $\gamma \equiv \frac{\partial w}{\partial Y}$. Then, for the initial rise in $Pr(\eta = 1)$ to be more likely with **lower** τ, it must be that $\frac{\partial \alpha}{\partial \tau} < 0$ and $\frac{\partial \gamma}{\partial \tau} > 0$. In the following, we thus show conditions under which these hold (which correspond to conditions (1) to (5) of Proposition 3).

First, from the expressions derived in the proof of Proposition 2, note that $\frac{\partial \alpha}{\partial \tau} = G'[\frac{\partial(\frac{\partial U_{E,f}}{\partial Y})}{\partial \tau} - \frac{\partial(\frac{\partial U_{E,b}}{\partial Y})}{\partial \tau}]$ is more likely to be negative if the following hold.

1. The effect of τ on the change in E's status distance from B (with respect to income) under case f is negative. That is,

$$
\frac{\partial[\frac{\partial(l_{E,f} - l_{B,f})}{\partial Y}]}{\partial \tau} = \frac{\partial(\frac{\partial l_{E,f}}{\partial Y})}{\partial \tau} - \frac{\partial(\frac{\partial l_{B,f}}{\partial Y})}{\partial \tau} < 0
$$

if $\frac{\partial l_{E,f}}{\partial Y} - \frac{\partial l_{B,f}}{\partial Y} > 0$, and $\geq$ otherwise.

2. The effect of τ on the change in E's status distance from B (with respect to income) under case b is positive. That is,

$$
\frac{\partial[\frac{\partial(l_{E,b} - l_{B,b})}{\partial Y}]}{\partial \tau} = \frac{\partial(\frac{\partial l_{E,b}}{\partial Y})}{\partial \tau} - \frac{\partial(\frac{\partial l_{B,b}}{\partial Y})}{\partial \tau} > 0
$$

if $\frac{\partial l_{E,b}}{\partial Y} - \frac{\partial l_{B,b}}{\partial Y} > 0$, and $\leq$ otherwise.

---

[19]These, along with $\frac{\partial v}{\partial Y}, \frac{\partial w}{\partial Y} \neq 0$, imply that $\frac{\partial[\frac{\partial v}{\partial Y}/\frac{\partial w}{\partial Y}]}{\partial Y} \neq 0$.

In turn, (1) and (2) are more likely if

(condition 3)

$$\frac{\partial(\frac{\partial l_{B,f}}{\partial Y})}{\partial \tau} > 0$$

if $\frac{\partial l_{B,f}}{\partial Y} > 0$, and $\leq$ otherwise and

(condition 5)

$$\frac{\partial(\frac{\partial l_{B,b}}{\partial Y})}{\partial \tau} < 0$$

if $\frac{\partial l_{B,b}}{\partial Y} > 0$, and $\geq$ otherwise.

That is, τ increases the rate at which the status threat from citizens increases when laws are disobeyed (case f), but decreases it when there are no laws (case b).

3. τ decreases the rate at which enforcement increases (under case f). That is,

(condition 2)

$$\frac{\partial(\frac{\partial C_{F,f}}{\partial Y})}{\partial \tau}, \frac{\partial(\frac{\partial C_f}{\partial Y})}{\partial \tau} < 0$$

if $\frac{\partial C_{F,f}}{\partial Y}, \frac{\partial C_f}{\partial Y} < 0$, and $\geq$ otherwise.

Similarly, $\frac{\partial \gamma}{\partial \tau} = G'[\frac{\partial(\frac{\partial U_{B,d}}{\partial Y})}{\partial \tau} - \frac{\partial(\frac{\partial U_{B,f}}{\partial Y})}{\partial \tau}]$ is more likely to be positive if the following hold.

4. τ increases the rate at which citizens' ability to evade the law increases. That is,

(condition 1)

$$\frac{\partial(\frac{\partial(\theta F)}{\partial Y})}{\partial \tau} > 0$$

if $\frac{\partial(\theta F)}{\partial Y} < 0$, and $\leq$ otherwise.

5. τ increases the rate at which the status threat from citizens increases when laws obeyed (case d). That is,

(condition 4)

$$\frac{\partial(\frac{\partial l_{B,d}}{\partial Y})}{\partial \tau} > 0$$

if $\frac{\partial l_{B,d}}{\partial Y} > 0$, and $\leq$ otherwise.

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E   Additional Result

Proposition 3 is made under assumption (b). For completeness, we also show conditions under which τ affects the likelihood of assumption (b).

For each of notation, let $\delta \equiv \frac{\partial(\frac{\partial v}{\partial Y})}{\partial Y}$ and $\epsilon \equiv \frac{\partial(\frac{\partial w}{\partial Y})}{\partial Y}$. Now, $\frac{\partial \delta}{\partial \tau} = G'[\frac{\partial(\frac{\partial \alpha}{\partial Y})}{\partial \tau}]$ is more likely to be negative if the following hold.

1. The effect of τ on $\frac{\partial[\frac{\partial(l_{E,f}-l_{B,f})}{\partial Y}]}{\partial Y}$ is negative if the latter is positive, and non-negative otherwise.

2. The effect of τ on $\frac{\partial[\frac{\partial(l_{E,b}-l_{B,b})}{\partial Y}]}{\partial Y}$ is positive if the latter is positive, and non-positive otherwise.

3. The effect of τ on $\frac{\partial[\frac{\partial(C_{F,f}+C_f)}{\partial Y}]}{\partial Y}$ is negative if the latter is negative, and non-negative otherwise.

   Analogously, $\frac{\partial \epsilon}{\partial \tau} = G'[\frac{\partial(\frac{\partial \gamma}{\partial Y})}{\partial \tau}]$ is more likely to be positive if the following hold.

4. The effect of τ on $\frac{\partial[\frac{\partial(l_{B,d}-l_{E,d})}{\partial Y}]}{\partial Y}$ is positive if the latter is positive, and non-positive otherwise.

5. The effect of τ on $\frac{\partial[\frac{\partial(l_{B,f}-l_{E,f})}{\partial Y}]}{\partial Y}$ is negative if the latter is positive, and non-negative otherwise.

6. The effect of τ on $\frac{\partial[\frac{\partial(\theta F)}{\partial Y}]}{\partial Y}$ is negative if the latter is negative, and non-negative otherwise.