Abstract

In this paper we study the role of religiosity in political choices such as redistribution and individual liberties. To a standard model with consumption and effort, we add a third good: civil liberties with a cap established by law. More liberties, like divorce, abortion, gender parity, or gay marriage, may be considered good by the secular and detrimental by the religious individuals. With standard assumptions on individual preferences, this implies that labor supply and income are lower for religious individuals in the presence of liberties. As a result there is a higher share of religious agents among the poor, consistent with evidence that the poor care more about "moral values". Still, we show that poor religious agents may prefer low taxes: such individuals also prefer that society restricts liberties, which suppresses income inequality in society and thus induces preferences for low taxes. We also show that restriction of liberties can arise as an equilibrium outcome of a simple political process when society is sufficiently religious. Moreover, if economic polarisation is lower than religious polarisation, such restriction of liberties results in lower taxation.

JEL-Classification: Key-words: Religiosity, Redistribution, Individual Liberties, Political Economy.
1 Introduction

In this paper we study the role of religiosity in political choices such as redistribution and individual liberties. Individuals differ in their degree of religiosity –ranging from fully secular to fully religious– and in their productivity. Because of the different valuation of individual liberties, religiosity has a direct effect on the individual choice of effort. We study this effect of religiosity on effort in Esteban, Levy and Mayoral (2015) [ELM (2015) hereafter]. Here instead we study individual preferences over government policies concerning liberties and redistribution, and characterise the outcome of majority voting.

As in ELM (2015), to a standard model where individuals have preferences over consumption and effort, we add a third (public) good: civil liberties. Divorce, abortion, gender parity, gay marriage or euthanasia are examples of the kind of liberties we have in mind. “Secular” individuals value liberties more than “religious” individuals do (with the latter possibly finding more liberties detrimental). With standard preferences (positive cross derivatives between consumption and liberties), this implies that wider liberties increase the marginal utility of consumption to seculars, but less so or even decrease it to religious individuals. Consequently, for a fixed maximum level of individual liberties allowed by the law, labor supply and hence income will decrease with religiosity. Importantly, this implies that wider liberties increase income inequality, as they create different labour supply incentives for religious and secular individuals.

The valuation of liberties may be composed of two components: (i) the personal use of liberties and (ii) the social externality of liberties, that is, the fact that such liberties are accessible to all. How much weight do individuals assign to the valuation of the private use of liberties versus the valuation that such use is accessible to anyone is a fundamental characteristic of the religious culture of each society. For the radical interpretation of Islam the main role of the state is to implement the religious norms. Also Catholicism, specifically at the time of the Inquisition, or Jewish beliefs that God may punish all even if only some have sinned, are examples of high concern for what the others do or can do. But some forms of Protestantism focusing on the personal relationship with god, independently of what others may do, or similarly Buddhism, seem obvious candidates for assigning a substantially lower weight to the possible externalities of exercising liberties.

We show that absent the social externalities component of liberties, all individuals in society prefer to have full liberties as

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3 On this issue see ELM (2015) and the references therein.
the legal cap. This implies that religious individuals are poorer, and hence are in favour of higher taxes on average. However, in the presence of the externality, the very religious individuals—even though also very poor—turn to favour low taxation. This arises as these individuals prefer to restrict the legal cap on liberties to a minimum. Such restriction of liberties reduces the overall productivity in society (and hence the tax base) and moreover represses income differences between seculars and religious and consequently income inequality. Both these effects imply that these religious individuals would combine their preferences for minimum liberties with preferences for relatively low taxation, compared with equally poor or even richer seculars who prefer wider liberties and higher taxation.

This result is consistent with the empirical data showing that religious individuals who are also poor often prefer low taxes compared with their secular counterparts, and vote accordingly to right-wing parties, who often offer platforms combining repression of liberties and lower taxes. The vote of poor religious individuals to such parties is considered by some to be a result of “forced choice”, that is, that such individuals trade-off moral values, which they like, for low taxes, which they do not like. Our analysis shows that this is not necessarily the case. Religious poor individuals are not being subject to “forced choice”: Compared to secular or less religious individuals who are richer than them, they would actually prefer the combination of repression and lower taxes.

In a simple sequential voting model with two religiosity levels and two productivity levels, we show that restriction of liberties along with relatively low taxation can also arise as a political outcome. This is the case when the externality aspect of liberties is sufficiently important, and when economic polarisation (e.g., inequality in productivities) is sufficiently low, so that the religious agents are not too divided by class. Thus more religious societies may induce lower taxation in our model both because (i) their income and aggregate output is lower; (ii) repression of liberties lowers income inequality and is thus bundled with lower taxes.

Our finding that religious societies may exhibit lower tax rates is consistent with recent empirical findings, showing that religious

\footnote{De La O and Roden (2008) show that in every country, it is primarily the moral values dimension rather than the economic dimension that pulls religious voters away from the left.}

\footnote{Huber and Stanig (2007) show that forced choice on individual liberty issues (so that right-wing parties on economic issues also restrict liberties) leads to more right-wing voting among all income groups, but more so among the poor.}

\footnote{This is also consistent with the empirical analysis in Stegmueller (2013), who finds that religious individuals have less liberal economic preferences.}
countries are characterised by lower level of redistribution. Several theoretical explanations have been suggested for such findings. In Scheve and Stasavage (2006), the psychic benefit from religion allows individuals to cope with bad states which nullifies the need for social insurance and hence religious individuals prefer smaller governments. In Benabou and Tirole (2006) religion is a way of manipulating one's beliefs in order to motivate continued effort and therefore religious agents will work harder and demand less taxes. Levy (2004) analyzes a two-dimensional policy space, such as general income redistribution and targeted redistribution, and shows that the rich individuals may form a party with the religious poor that will reduce total taxation but target its revenues to specific religious interests at the expense of general redistribution. In Huber and Stanig (2011), the rich and the religious poor form electoral coalitions in favor of low taxes where in return the rich provide directed side payments via charity to the religious poor. Our theory differs as it builds both on (i) the pressures of the seculars to redistribute less when there are more religious agents in society as these agents are less productive, and on (ii) the pressures of the religious agents to reduce liberties and as a result to decrease taxation when society becomes less productive but more equal.

There have recently been a few contributions linking religiosity with development and growth. Carvalho and Koyama (2012) argue that religions choose their restrictions strategically to induce labour and capital contributions as a response to exogenous economic changes. In Benabou, Ticchi and Vindigni (2014) religiosity blocks innovations and hence reduces output (religiosity also reduces output in our case but through a different channel) in order to preserve religious preferences and hence redistribution towards religious goods (versus general income redistribution). They show that a more religious society induces lower taxation as then the winning coalition forms along the religiosity cleavage instead of the class one.

The remainder of the paper is organized as follows. In the next Section we present the baseline model and some preliminary results. Section 3 enriches the model by making individual prefer-

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7 See Scheve and Stasavage (2006), Palani (2008) and Rees (2009). The causality may also go in the other direction. A more unequal society may cause agents to feel less secure which may lead them to turn to religion as a source of comfort (Rees 2009).

8 See also Gill and Langgaarde (2004) and Clark and Lelkes (2004).

9 In Elkin, Goskel and Gurdal (2010), for the religious organizations to work, people need to make financial sacrifices. They would therefore prefer more disposable income (to make it voluntary so to signal better) and thus they prefer less taxes.
ences dependent on the legal cap on individual liberties. Section 4 considers the preferences of individuals over taxes and liberties. In Section 5 we analyze the political determination of these policies. We discuss the implications of our findings in Section 6.

2 The benchmark model and preliminary results

Society needs to choose a two-dimensional policy: a proportional tax rate $t$ and the legal cap on liberties, $\ell \in \{0, 1\}$. Individuals would then consume their disposable income, which would be a result of their (endogenous) earning and some level of redistribution. Individuals also “consume” liberties. Specifically, given the legal cap $\ell$, the consumption of individual liberties, $\ell^i$, satisfies $\ell^i \leq \ell$.

We now consider the economic preferences over liberties, consumption, and effort. To solve the political model we will work with a particular utility function. We specify this utility function and the economic environment in more detail below, but as the key insight driving our analysis is more general, we first describe it in more general terms (as we also do in ELM 2015).

Our main assumption is that the valuation that individuals place on the personal use of civil liberties is lower the more religious they are (and possibly even negative). Together with an assumption on standard complementarities between the usual consumption goods $c$ and the consumption of liberties $\ell^i$, this implies that while $u_{c\ell^i} > 0$ for “seculars”, it is lower (and possibly even negative) the more religious is the individual, for some $u(c, l, \ell^i)$ where $l$ denotes the level of the chosen labour effort (which affects earnings). This is also consistent with the fact that religiosity induces individuals to lower their appreciation for material pleasures and rewards, and the more so the higher the level of religiosity.\(^\text{10}\) It is then easy to show that as long as the complementarities between leisure and liberties are not too high, the above implies:\(^\text{11}\)

**Proposition 1** (ELM 2015): Labor supply is negatively related to religiosity and this relationship is enhanced by the degree of the legal cap on liberties, $\ell$. A higher legal cap increases income inequality.

Intuitively, since the marginal utility of consumption is lower for the religious individuals, they will have less of an incentive for

\(^{10}\)See Iannaccone (1992), and Guiso, Sapienza and Zingales (2006).

\(^{11}\)Note that religious and secular individuals differ substantially in how they spend their leisure, and religions often prescribe very specific ways in which leisure time should be spent (e.g., performing rituals, reading the Bible, not working on the Sabbath, etc.). As a result, it is not obvious what is the right assumption in terms of the marginal utility of leisure as a function of liberties and the degree of religiosity, and we therefore abstract from it. Moreover, Proposition 1 is supported by the empirical analysis.
working hard. Moreover, increasing the legal cap on liberties increases income inequality, as secular individuals for whom the legal cap was binding, can now consume more liberties and accordingly exert more effort. In ELM (2015) we also show these predictions empirically. While at first these results seem to be in conflict with the Weberian hypothesis, note that this hypothesis compares different types of religions (while in the time of the Reformation, seculars were a negligible part of the population) \[12\]

More generally, one can derive Proposition 1 from many other formulations. Restriction of liberties can also affect adversely the productivity of religious individuals; for example, the Amish are inherently less productive because they choose not to make use of labour-augmenting technology for religious reasons (and instead do everything by manual labour), whereas the secular are willing to use modern machines. This makes the Amish less productive.

Finally note that while other papers have established that religiosity may affect labour supply and aggregate output (through individuals investing in non productive activities such as rituals) \[13\] here we focus on the role of religious restrictions of individual liberties as reducing the incentives to supply effort. This is important as it may affect the political choices of liberties (as opposed to other productivity reducing activities such as rituals).

We now specify the economic environment in more detail. First, for concreteness, we will consider a specific utility function:

\[
u_x(c, l, \ell^i) = c \left[ 1 + \left( 1 - x \right) \ell^i \right] - \frac{1}{2} l^2, \tag{1}\]

where an index \(x \in [0, 2]\) captures how intensely individuals are against liberties, with \(x < 1\) capturing “secular” preferences and \(x > 1\) capturing “religious” preferences. This is a standard useful specification of individual preferences where liberties are viewed as a consumption “good”. We assume for simplicity that the cost of effort is additively separable from the utility from consumption goods and liberties. Assume that liberties are free to use, which implies that the optimal “consumption” of liberties is \(\ell^i = \ell\) if \(x \leq 1\) or \(\ell = 0\) if \(x > 1\) \[14\].

Religiosity is distributed according to the cdf \(G(x)\). We shall denote by \(x_s\) and \(x_r\) the average religiosity among the secular and the religious individuals, respectively. Let \(\sigma\) be the proportion of seculars in society, \(\sigma = G(1)\). Besides their level of religiosity, individuals

\[12\] We will discuss this further after introducing the externality effect of liberties, in the next Section.


\[14\] The analysis can be easily extended to the case in which there are some cost to exercise liberties.
are also characterised by their earning capacity or productivity $w$, so that pre-tax income will be $wl$. The individual productivity $w$ is distributed according to the cdf $F(w)$, with expected value $\mathbb{E}[w]$ and second moment $\mathbb{E}[w^2]$. We focus on the case where religiosity and productivity are independently distributed.\footnote{In Appendix II we discuss the case of correlation between earning capacity and religiosity.}

We assume that there is a purely redistributive linear income tax with a marginal rate $t$ and a budget balancing per capita transfer $T$. Therefore,

$$c = (1-t)wl + T,$$

and thus the labour supply is chosen to be

$$l = (1-t)w(1 + (1-x)\ell) \text{ if } x \leq 1$$

$$l = (1-t)w \text{ if } x > 1.$$

The above implies, in line with Proposition 1, that religious individuals would be on average poorer than the secular ones, everything else equal, and that income inequality would increase when liberties are allowed.

We now derive the indirect utility over the political variables: taxation $t$ and the legal cap $\ell$. Note that the pre-tax market income $y(w, x, t)$ will be

$$y(w, x, t) = (1-t)w^2[1 + (1-x)\ell(x)]$$

where $\ell(x) = \ell$ if $x \leq 1$ and 0 otherwise. Aggregating over $w$ and $x$, we obtain the average per capita income

$$\overline{y}(t, \ell) = (1-t)\mathbb{E}[w^2](1 + \rho \ell).$$

where

$$\rho \equiv \sigma(1-x_s) > 0.$$  

The term $\rho$ determines the sign of the effect of liberties on output. The aggregate tax collection —equal to the per capita transfer $T$— is

$$T = t\overline{y} = t(1-t)\mathbb{E}[w^2](1 + \rho \ell).$$

Therefore, the indirect utility over $(t, \ell)$ can be written as:

$$v_{w,x}(t, \ell) = \frac{1}{2}(1-t)^2w^2[1 + (1-x)\ell(x)]^2 +$$

$$+ t(1-t)\mathbb{E}[w^2][1 + \rho \ell][1 + (1-x)\ell(x)].$$
It will be useful to start with the following result which characterizes preferences over taxes when the legal cap $\ell$ is fixed. Let $t_{w,x}(\ell)$ denote the preferred tax rate by individual $(w,x)$ given a fixed legal cap $\ell$. Consider 
\[
y(w_{x},x,t,\ell) = \frac{w^{2}[1+(1-x)\ell(x)]}{E(w^{2})[1+\rho\ell]}\] and note that it is independent of $t$. From (4) it is easy to derive $^{16}$

**Proposition 2** For a fixed $\ell$, $t_{w,x}(\ell) = \max\{0,1-\frac{y(w_{x},x,t,\ell)}{y(t,\ell)}\} \leq \frac{1}{2}$.

Hence, for any given $\ell$, as is standard, all individuals with income below the mean income ($\frac{y(w_{x},x,t,\ell)}{y(t,\ell)} < 1$) prefer some positive taxation and all above ($\frac{y(w_{x},x,t,\ell)}{y(t,\ell)} > 1$) prefer no taxation. Also, all with the same income will prefer the same tax rate, independently of their religiosity and of their productivity, as depicted in Figure 1. We will see below that this will change when we consider the joint preferences over liberties and redistribution.

**Figure 1. Preferences for redistribution**

It is also useful to derive the effect of the cap on liberties $\ell$ on the preferred tax rate $t$.

**Proposition 3** Consider some $\ell$ and all pairs $(w,x)$ such that $\frac{y(w_{x},x,t,\ell)}{y(t,\ell)} < 1$. Then, there exists $x^{0}$ such that the preferred $t_{w,x}(\ell)$ decreases [increases] with respect to $\ell$ for all $x \leq [\geq]x^{0}$, with $x^{0} = 1 - \rho < 1$.

\[^{16}\text{It is straightforward to derive the first order condition from the indirect utility with respect to} \ t \ \text{and to show that it is sufficient.}\]
The intuition for Proposition 3 is as follows. An increase in liberties always enhances the incentives to secular individuals, and as a result increases their income. The effect will be bigger the more secular the individual is. But as \( \rho > 0 \), the aggregate income has also gone up together with the income of the secular. This implies that while the relative income of the very secular increases, the relative income of the religious and the very moderately secular decreases. Hence, the moderately secular will join the religious and favour higher redistribution as a response to more liberties.

Finally, it is easy to derive from (4) the following preferences over \((t, \ell)\):

**Proposition 4** The ideal policy of all individuals in society is \( \ell = 1 \) and \( t_{w,x}(1) \) as derived in Proposition 2.

The intuition for the above is simple. For all individuals, for any fixed \( t > 0 \), liberties are useful. For the secular individuals, liberties increase aggregate output and benefit from taxation along with their own individual income, as can be seen from (4), as \( \ell(x) = \ell \). For religious individuals, \( \ell(x) = 0 \) but as \( \rho > 0 \), they too support the maximum legal cap as this increases their benefit from taxation, if they prefer positive taxation. Religious individuals who prefer \( t_{w,x}(1) = 0 \) would also prefer \( t_{w,x}(0) = 0 \) and their utility is the same under both legal caps and preferred taxes. Religious individuals who prefer \( t_{w,x}(0) = 0 \) and \( t_{w,x}(1) > 0 \), have to compare \((0,0)\) to some \((t_{w,x}(1), 1)\). But for these individuals \( v_{w,x}(0,0) = v_{w,x}(0,1) < v_{w,x}(t_{w,x}(1), 1) \), and thus all individuals -at least weakly- have \( \ell = 1 \) as their ideal policy.

We have seen therefore that while effort incentives are different for religious individuals and secular ones, all individuals in society have full liberties as their ideal policy. For the religious, this arises as they take into consideration the work incentives of the seculars with the corresponding increase in the tax base. For the seculars, this also increases their personal pre-tax income. We will now extend the scope of the utility from liberties and derive the political choices over liberties and redistribution.

3 Liberties and externalities

We now consider the other effect of the legal cap on liberties that we have mentioned in the Introduction. While the legal cap establishes the limit to what is accessible to individuals, it can also produce an externality because individuals may like or dislike to be in a society where some liberties are permitted, independently of whether or not they will personally use them. We see demonstrations, sometimes even violence, against and for specific liberties.
in which most of the participants do not appear to be potential users of such liberty. Conservative [liberal] governments regularly include in their manifestos the tightening [broadening] of individual rights such as gender parity, abortion, or homosexual marriage, obviously as a response to demands by their respective constituencies. And for the vast majority of supporters of either side, this is a “matter of principles” and not of facilitating or repressing their own personal use. Since individuals are always free to refrain from using the civil rights, the insistence on regulating these actions by law of universal application clearly reveals the existence of a strong externality motive.

In order to take this externality effect into account, we represent the effect of liberties on individual preferences as a convex linear combination of the personal use of them, \( \ell^i \), and the maximum legally permitted \( \ell \), that is \((1 - \alpha)\ell^i + \alpha\ell\). The parameter \( \alpha \in (0, 1) \) indicates the relative weight of the externality effect of liberties, how much individuals are concerned by what is accessible to the others, or “religious intolerance”. Note that while we model this as an externality from the legal cap itself, it is identical to an externality from what is actually consumed by others (as seculars consume whatever is accessible). Alternatively we can model it as an externality that depends on the share of people who exercise these liberties. This will not make a qualitative difference in our model.

We assume then that the utility valuation of \((c, l, \ell)\) is:

\[
 u(c, l, \ell, x) = c \left[ 1 + (1 - x)[(1 - \alpha)\ell^i + \alpha\ell] \right] - \frac{1}{2} l^2. \tag{5}
\]

Note also that while we are focusing on an environment in which the externalities arise from the legal cap (or analogously the maximum level of liberties consumed), individuals may as well be “concerned” about others consuming the minimum level of liberties. In current times in France, secularism is manifested by individuals possibly experiencing negative externalities from those who consume low level of liberties (where we interpret a woman being forced by its religion to wear a veil as a restriction of her liberties). But this seems to be the exception and in general liberal secularism seems to be tolerant towards religious practices as long as they do not affect human rights very narrowly defined; in any case, we abstract away from this version of secularism.

From the above it is clear that as religious individuals will continue to consume zero liberties and secular ones will consume the legal cap, the individual liberties component will be either \( \ell \) for secular individuals or \( \alpha\ell \) for religious.

Note that now we redefine \( \rho \), which measures the effect of
liberties on aggregate output, to be:

$$\rho \equiv \sigma (1 - x_s) + (1 - \sigma)(1 - x_r) \alpha,$$

which can be interpreted as an aggregate index of social secularism; \(\rho\) can then be either positive or negative.

It is then easy to derive (which again, can be generalized to more general preferences) that:

**Proposition 5** *For any \(\ell > 0\), the level of effort of the religious individuals, as well as aggregate output, decreases with \(\alpha\).*

In the prism of our model, religions could differ in the degree of the externality \(\alpha\). Specifically, a key distinctive feature of Protestantism at the time of the Reformation was the personal, direct communication with god. It is therefore a much more individual religion compared with Catholicism. In the prism of our model, Catholics can be thought then of having a higher \(\alpha\) than Protestants. As in Weber (1904), the Reformation would in our model explain the higher economic performance of the protestant countries, but through a different channel.

For the rest of the paper we focus on the case of \(\rho \geq 0\). This is not important for the qualitative results but it is the more interesting case to focus on if we want to show that repression of liberties can arise.

4 Individual preferences over taxes and liberties

We now examine the joint preferences over liberties and taxes under the specification with externalities. We will show that the social externalities of liberties imply a preference of religious individuals for repression of liberties, which will also result in preferences for lower taxation, compared with seculars with the same productivity and income.

The result stated below characterises the ideal policies of all individuals and uses Proposition 2 which is easily adapted to the case in which externalities arise.

**Proposition 6** *There exists \(x(w) \geq 1\), with \(x(w) = 1\) for a sufficiently high \(w\) and \(x(w) > 1\) and \(\frac{\partial x(w)}{\partial w} < 0\) otherwise, such that all individuals \((w, x)\) with \(x \leq x(w)\) prefer \(\ell = 1\) and \(t_{w,x}(1)\) and all individuals \((w, x)\) with \(x > x(w)\) prefer \(\ell = 0\) and \(t_{w,x}(0)\), where \(t_{w,x}(\ell)\) is as defined in Proposition 2.*

**Proof:** see Appendix.

Figure 2 illustrates the result above. For the seculars, the results are straightforward: all those with \(x < 1\) prefer full liberties.
Those that are rich enough prefer zero taxation, and those that are relatively poor have positive taxation (which increases in $x$ and decreases in $w$). As for the religious individuals, in the upper part of the Figure, the richer ones (with $w^2 > E(w^2) \frac{1+\rho}{1+(1-xr)\alpha}$) will prefer zero taxation for any level of liberties and, conditional on no taxation, they prefer then $\ell = 0$. Religious individuals with $w^2$ in $[E(w^2), E(w^2) \frac{1+\rho}{1+(1-xr)\alpha}]$, prefer zero tax when $\ell = 0$ and positive tax when $\ell = 1$. In the lower $w$ region, individuals prefer positive level of taxes (but lower one when $\ell = 0$) for any level of liberties. The function $x(w)$ determines the individuals who are indifferent between liberties and repression given these preferred taxes.

In general, for religious individuals, increased liberties have an ambivalent effect. The increase in output and transfers has to be weighed against the loss in own incentives because of the negative valuation of the social component of liberties. Those with a sufficiently high productivity would be rich enough and would prefer no redistribution at all. For them, restricting liberties would not be costly but only beneficial. For the poorer individuals, our result says that there is a threshold level of religiosity $x(w)$, such that for each given $w$, the religious individual at that level will be indifferent between the two extreme levels of liberties (each associated with its optimal level of taxation). If they are not too religious (that is, when $x < x(w)$), the net effect of liberties will still be positive. Once they become more religious though, the negative effect of liberties becomes sufficiently important and they prefer to ban them altogether.

Figure 2. Joint preferences for redistribution and liberties
Note that $x(w)$ decreases in $w$ as the higher is the religiosity, the lower is the productivity level in which the individual will prefer to switch to repression and hence the lower is the income at which the individual will prefer repression. We therefore predict that higher religiosity is associated with poorer individuals who support repression.

An important implication of Proposition 6 is that, due to their preferences for less liberties, religious individuals might also prefer lower taxes compared with their secular counterparts. The preference for taxation by religious individuals turns out to be non-monotonic in their level of religiosity:

**Corollary 7** Preferences over taxation are (weakly) non-monotonic in religiosity. Thus, for the same level of productivity $w$, some religious individuals -who are therefore relatively poor- prefer lower taxes than do less religious individuals -who are relatively rich.

The key point is that as individuals become more religious their preferences for liberties switch to full repression. But, by Proposition 3 this implies that their preference for taxation goes down. This arises as lower liberties implies less aggregate output (and thus lower benefit from taxation) together with higher individual output for the religious, resulting in lower inequality.

In Figure 2, we identify the iso-tax curves for the optimal taxes in the $(w, x)$ space. In the region below $x(w)$, all support full liberties, and therefore will support the same tax when they have the same income, lets say some $t_1$. This part of the iso-tax curve will contain individuals with low productivity and low religiosity and those with higher productivity and higher religiosity. Once this curve hits $x(w)$ though, individuals switch to preferring repression and hence support lower taxes. Thus those that will support $t_1$ above $x(w)$ will correspond to individuals with lower productivity, and clearly lower income, compared to the type on $x(w)$. As can be seen in the Figure, if one fixes $w$, and increases religiosity, preferences for taxation will increase first as income decreases, until $x(w)$ is reached, in which case the preferred taxes decrease, even though current income (at any fixed level of liberties) is lower for these individuals. Note that above $x(w)$ preferences for taxation do not depend on the level of religiosity as, given repression ($\ell = 0$), religiosity does not alter income. Note also that the discontinuity in the indifference curves that arises from the extreme form of liberties we consider is not important; even if we allow for all $\ell \in [0, 1]$, there would be parameters for which the very religious and poorer individuals would choose lower taxation than richer ones, as they prefer very low liberties.
The result above is consistent with the empirical data showing that religious individuals who are also poor often prefer low taxes compared with their secular counterparts, and vote accordingly to right-wing parties. In our model, for a given productivity, an increase in religiosity reduces relative income and hence individuals support more redistribution or are more “left-wing”. But if religiosity increases further it eventually reaches the tipping point at which more religiosity induces individuals to prefer restrictions on liberties and hence lower taxes, implying that switch to vote “right-wing”. The vote of poor religious individuals to right-wing parties, which often combine restrictions on liberties with lower taxes, is considered by some to be a result of “forced choice”. That is, such individuals are considered to trade-off moral values, which they like, for low taxes, which they do not like. Our analysis shows that this is not the case. Religious poor individuals are not being subject to “forced choice”. Compared to secular or less religious individuals who are richer than them, they would actually prefer the combination of repression and lower taxes.

We next turn to the political determination of liberties and taxation. We will show that a similar effect can arise when we allow for strategic political choices. That is, high enough religiosity will result in repression which is then accompanied with lower taxes.

5 Voting over redistribution and liberties

In this Section we examine the political choice over the two policies: liberties and taxation. We consider a simple political model with sequential voting, first on the cap on liberties $\ell$ and then on $t$. The particular sequence of voting does not affect the results. It seems realistic though to think that decisions on individual liberties are taken less frequently and are more likely to be part of constitutions compared with the almost “daily” political conflict over redistribution.

In the previous section we have examined the ideal level of redistribution and liberties for each individual. The question we are examining now is substantially different: The sequentiality of the vote introduces a strategic consideration. Once the level of liberties has been chosen, the vote over redistribution is straightforward: every individual will vote for the tax that is best for her, given the liberties. However, the choice of liberties is more strategic because the chosen level of liberties will affect the income distribution, and will therefore influence who is the median voter in the second stage and her desired redistribution. We show that even in the presence of strategic voting effects as described in the

\[^{17}\text{See Huber and Stanig (2007) and De La O and Roden (2008).}\]
previous Section continue to follow: high enough religiosity will result in repression and lower taxes.

In order to better capture the forces at work we shall focus on a simplified model with four groups. The groups are obtained as a result of the crossing of two productivity levels, \( w_h \) and \( w_l \), high and low, and two religiosity levels, \( x_s < 1 < x_r \), secular and religious. The four groups are then the religious high-productivity agents \( (rh) \), the secular high-productivity agents \( (sh) \), the religious low-productivity agents \( (rl) \) and the secular low-productivity agents \( (sl) \). We assume that no single group has a majority. We also assume that the low productive workers are in a majority, that is, their share \( p \) satisfies \( p > \frac{1}{2} \). We shall denote by \( \pi_w \) the “economic gap”, \( \pi_w \equiv \frac{w_h^2}{w_l^2} \), and by \( \pi_r \) the “religious gap”, \( \pi_r \equiv \frac{1+(1-x_s)}{1+(1-x_r)\alpha} \). To fix ideas, let \( x_s = 0 \). This specification is favorable to liberties, as an increase in liberties gives the highest increase in aggregate output through \( \rho \). We therefore consider the environment with the lowest incentive to vote for repression. Note then that \( \pi_w \in [1, \infty) \) and \( \pi_r \in [2, \infty) \).

We start by analysing a simple –but insightful– case and then present the general results.

5.1 The non-monotonic effect of religiosity on policy choice

Consider the case of a society which is divided only according to the religious gap, so that \( \pi_r > 2 \) and \( \pi_w = 1 \). For simplicity assume that \( w = 1 \). In such a society, as the cap on social liberties \( \ell \) rises, income inequality will be generated by the differential incentive to work linked only to the religious gap between secular and religious individuals.

Suppose that in the first stage \( \ell = 0 \) has obtained majoritarian support. In this case religiosity plays no role, all the individuals supply the same effort and earn the same income. In this scenario all will agree on a zero tax rate. Hence, everybody’s income can be easily computed to be \( v_i(\ell = 0, t = 0) = \frac{1}{2} \), for \( i \in \{s, r\} \). Suppose now that we are under \( \ell = 1 \). Then the secular would be richer than the religious due to their enhanced incentives to work. If the secular are in a majority they will clearly impose \( (\ell = 1, t = 0) \). What would the religious choose under \( \ell = 1 \) if they were a majority? Under full liberties the religious are the poor and hence the chosen tax rate will be \( t = \frac{1 - (1 + (1-x_r)\alpha)}{2 - (1 + (1-x_r)\alpha)} = \frac{[\sigma \pi_r + (1-\sigma)]-1}{2[\sigma \pi_r + (1-\sigma)]+1} \). It can be readily verified that this tax is strictly increasing in religious gap, \( \pi_r \). The utility attained by the religious will be \( v_r(\ell = 1) = \frac{1}{2}(1-t)^2[1+(1-x_r)\alpha]^2 + t(1-t)(1+\rho)[1+(1-x_r)\alpha] \). Plugging here
the value of $t$ we can obtain the condition for the religious prefer $(\ell = 0, t = 0)$ that we present in the following Lemma.

**Lemma 8** Let the religious be in a majority in a society which is only divided along religious lines. Then liberties are repressed if and only if $(1 + \rho)^2 < 2[\sigma \pi_r + (1 - \sigma)] - 1$, which holds whenever the religious gap is large enough.

The religious individuals face the following trade-off: liberties increase aggregate production but make them much poorer compared with the seculars. If the increase in aggregate production (driven by $\rho$) and the transfers they receive can compensate them for their own reduction in income (because of the disincentive effect of the externality side of liberties $\alpha$), as well as for the direct “psychological” cost driven by $\alpha$, then they would also prefer full liberties. Otherwise, they prefer repression.

This trade-off is manifested in the condition in the Proposition. The higher is the religious gap (through $\alpha$ or $x_r$), the lower is $\rho$ and the more likely it is that the condition is satisfied. At the extreme, when $\rho = 0$ because society is sufficiently religious, the aggregate output does not increase with liberties and the religious would only experience a utility loss from liberties, via the externality effect. The other side of the coin is that when $\alpha = 0$ - as in our benchmark model - the religious will support liberties because the tax revenue and the transfer will be positive at no cost to them.

Under full liberties, as the religious gap increases, the tax imposed by the religious will increase as well as they become relatively poorer. However, beyond a point the cost of liberties will dominate the benefits and the religious will choose the repression of liberties, which equalizes income and hence leads to lower, and in this case, zero, taxation. We therefore see again the non-monotonicity of taxation as a function of religiosity. More importantly, we see that in sufficiently religious societies repression will trigger lower taxes. In the general model, below, this will arise whenever the religious gap is sufficiently large compared to the economic gap.

### 5.2 The General Case

In the general case there are two sources of difference between individuals: economic and religious. Both dimensions contribute to income inequality. We start by analyzing the political outcomes of voting over taxes for any level of liberties.

#### 5.2.1 Voting over taxes

When $\ell = 0$ religious differences have no effect on behaviour and hence only the economic gap matters. Therefore, being in a majority, the low productive individuals will be the pivotal voters when
it comes to vote for redistribution. If follows that voting for $\ell = 0$ in the first stage carries with it the choice of $t_l(0)$, the preferred tax by the majoritarian low skilled,

$$t_l(0) = \frac{E(w^2) - w_i^2}{2E(w^2) - w_i^2} = \frac{1}{2} - \frac{1}{p+(1-p)\pi_w} = \frac{1}{2} - \frac{1}{(p+(1-p)\pi_w)}.$$  \hspace{1cm} (6)

Consider now what happens under full liberties, $\ell = 1$. Since the high-productive secular $sh$ group is the richest, and the low-productive religious group $rl$ is the poorest, the ideal policies of these groups will not be candidates for the median income voter. We therefore concentrate instead on the middle income groups $sl$ and $rh$. Which income of the two is lower and consequently the tax demanded higher depends on the relative size of the two gaps, $\pi_w$ and $\pi_r$. See Figure 3.

Figure 3. Pivotal voter: small and large religious gap

When the religious gap dominates the economic gap, then $rh$ prefers a higher tax than $sl$. If the religious are in a majority the $rh$ will be pivotal (and gaining the support of $rl$), and the tax level would be at $t_{rh}(1)$. If the seculars are in a majority, then $sl$ is pivotal (by gaining the support of $sh$), and tax would be set at $t_{sl}(1)$. In the case the economic gap dominates the religious one, the low productivity groups will have the lowest incomes. Since they are assumed to be a majority the pivotal group will be $sl$ and society will choose $t_{sl}(1)$. 

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Both $t_{rh}(1)$ and $t_{sl}(1)$, computed accordingly with Proposition 2, are

$$t_{rh}(1) = \max\{0, \frac{1 - \frac{w^2_h(1+(1-x_r)\alpha)}{E(w^2)(1+\rho)}}{2 - \frac{w^2_h(1+(1-x_r)\alpha)}{E(w^2)(1+\rho)}}\} = \max\{0, \frac{1 - \frac{\pi_w}{p+(1-p)\pi_w} \frac{1}{\sigma\pi_r+(1-\sigma)}}{2 - \frac{\pi_r}{p+(1-p)\pi_w} \frac{1}{\sigma\pi_r+(1-\sigma)}}\}$$

and

$$t_{sl}(1) = \max\{0, \frac{1 - \frac{2w^2_l}{E(w^2)(1+\rho)}}{2 - \frac{2w^2_l}{E(w^2)(1+\rho)}}\} = \max\{0, \frac{1 - \frac{\pi_r}{p+(1-p)\pi_w} \frac{\pi_r}{\sigma\pi_r+(1-\sigma)}}{2 - \frac{\pi_r}{p+(1-p)\pi_w} \frac{1}{\sigma\pi_r+(1-\sigma)}}\}$$

(7)

$$t_{sl}(1) < t_{l}(0)$$

(8)

We can thus conclude that voting for liberties implies that the $sl$ group will be pivotal in the second stage and choose $t_{sl}(1)$, unless $\pi_r > \pi_w$ and $\sigma < \frac{1}{2}$. Note that $t_{sl}(1) < t_{l}(0)$, as the $sl$ always become relatively richer when liberties are introduced, while $t_{rh}(1)$ may be higher than $t_{l}(0)$, as the $rh$ may become relatively poorer as a result of liberties. We summarise these results in the following Lemma.

**Lemma 9** Under no liberties $\ell = 0$ the median voter in the second stage will be the low skilled group and will choose $t_{l}(0)$. Under full liberties $\ell = 1$, the pivotal voter will be the $sl$ and will choose $t_{sl}(1) < t_{l}(0)$, unless both $\pi_r > \pi_w$ and $\sigma < \frac{1}{2}$, in which case the $rh$ is pivotal and chooses $t_{rh}(1)$.

Note from (7) and (8) that with full liberties and a religious majority, the majoritarian tax is non-monotonic with respect to the religious gap. This is because of the change of the median voter group from $sl$ to $rh$. When $\pi_r < \pi_w$ the chosen taxation under liberties decreases with the religious gap. This arises as the seculars become less inclined to subsidise the religious who are poorer on average. On the other hand, the opposite arises for $\pi_r > \pi_w$, where taxation increases with the religious gap, as the $rh$ become poorer on average and demand more taxation. This is depicted in Figure 3. Note that the tax under liberties can also become 0 (we will get back to this later on).

Figure 4. Taxation and the religious gap under $\ell = 1$

\[18\] We have that $t_{rh}(1) > <t_{l}(0)$ as $\pi_w < (>) (1-\sigma) + \sigma \pi_r$. 

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5.2.2 Voting over liberties

We now turn to the choice of liberties. When \( \sigma > \frac{1}{2} \) and the seculars are a majority we know by Lemma 9 that the \( sl \) will always be the pivotal voters in the second stage. The \( sl \) prefer \((\ell = 1, t_{sl}(1))\) to \((\ell = 0, t_{l}(0))\) because for a given \( t_{l}(0) \) they would prefer \( \ell = 1 \) and given full liberties they prefer their optimal tax \( t_{sl}(1) \). This also holds for \( sh \) because they obtain full liberties and lower taxation. Hence,

**Lemma 10** When the secular are in a majority \((\sigma > \frac{1}{2})\), the outcome of the sequential voting will be \((\ell = 1, t_{sl}(1))\).

We now examine the political outcome under a religious majority, \( \sigma < \frac{1}{2} \). We first establish that both religious groups need to support repression for this to arise\(^{19} \).

**Lemma 11** When \( \sigma < \frac{1}{2} \), whenever \( \ell = 0 \) obtains majoritarian support it must be that the two religious groups vote for repression.

**Proof.** It is easy to see that both secular groups vote for full liberties when \( t(1) < t_{l}(0) \) for \( t(1) = \max\{t_{sl}(1), t_{rh}(1)\} \). In this case the two secular groups vote for \( \ell = 1 \) because \((\ell = 1, t(1))\) is preferred by both to \((\ell = 1, t_{l}(0))\) (as either \( sl \) is pivotal over \( t(1) \) so that this is its optimal tax under full liberties, or \( rh \) is pivotal over \( t(1) \) in which case \( sl \) prefers an even lower tax). Finally, \((\ell = 1, t_{l}(0))\) is preferred by both to \((\ell = 0, t_{l}(0))\). Thus we have established that the Lemma is correct for \( t(1) < t_{l}(0) \).

Now we need to consider \( t(1) > t_{l}(0) \). Note that to vote for \( \ell = 0 \), we need for the religious groups that \( v_{ri}(\ell = 0, t_{l}(0)) > v_{ri}(\ell = 1, t(1)) \)

\(^{19} \)Note that this is not obvious as for example the \( sh \) may collude with \( rl \) to repress liberties, as \( sh \) will enjoy the reduction in taxes in the case in which \( t_{rh}(1) > t(0) \).
which holds iff:

\[(1 - t(1))^2(1 + (1 - x_r)\alpha)^2 - (1 - t_l(0))^2 + \]
\[2 \frac{E(w^2_i)}{w^2_i} [(1 + \rho)(1 + (1 - x_r)\alpha)t(1)(1 - t(1)) - t_l(0)(1 - t_l(0))] < 0 \]

and similarly for the secular groups that:

\[(1 - t(1))^2(1 + (1 - x_s))^2 - (1 - t_l(0))^2 + \]
\[2 \frac{E(w^2_i)}{w^2_i} [(1 + \rho)(1 + (1 - x_s))t(1)(1 - t(1)) - t_l(0)(1 - t_l(0))] < 0 \]

It is therefore obvious that whenever a secular group \( s_i, i \in \{l, h\} \), votes for \( \ell = 0 \), so will a religious group. Moreover, note that if \( s_l \) votes for \( \ell = 0 \), so must \( s_h \) as the expression in the square brackets is positive and \( w^2_h > w^2_l \). Therefore, if \( \ell = 0 \) is chosen by society, then: (i) if \( s_l \) votes for \( \ell = 0 \), then so must \( s_h \) and hence both religious groups will vote for it as well; (ii) if \( s_l \) does not vote for repression, then if both religious groups do not vote for repression, \( s_h \) must do so for it to win. But if this is the case, then so will \( r_h \). But these two high productivity groups will not constitute a majority, a contradiction. This implies that if \( \ell = 0 \) is chosen, then the two religious groups must vote for it. ■

Given the above, for sufficiently high religious gaps, we can generalize the result of the Example in the previous Section:

**Lemma 12** When \( \sigma < \frac{1}{2} \), society chooses \( \ell = 0 \) whenever \( \pi_r > \max\{2\sigma + 2\sqrt{\sigma^2 - \sigma + 1}, \frac{\pi_w - (1 - \sigma)}{\sigma}\} \).

**Proof:** In Appendix I.

Note that a large religious gap compared to a low economic gap creates an incentive to vote for repression for two reasons. A large religious gap obviously implies that religious individuals dislike liberties. But it is also the case that a low economic gap compared to the religious one implies that the preferences of the two religious groups are relatively close. This implies that it is easier to get the support of both for the same political outcome, which is what we need for repression as identified in Lemma 11.

At the other extreme, consider a low religious gap, for example as in our benchmark model when \( \alpha = 0 \). In this case the utility of \( r_h \) increases with liberties for the same given tax \( t_l(0) \). For \( \pi_r \leq \pi_w \) we have that \( t_l(0) > t_s(l)(1) \geq t_r(h)(1) \). Hence for this range of values \( r_h \) prefers \( \ell = 1 \) as the chosen tax rate is closer to her ideal policy. For \( \pi_r > \pi_w \) and \( \sigma < \frac{1}{2} \), the tax under liberties is precisely her utility maximising \( t_r(h)(1) \), so that \( \ell = 1 \) will continue to be preferred by


$rh$ to repression. By continuity, this must also hold for sufficiently low $\alpha$ (or $x_r$). As repression will not arise if one religious group is against it, we have:

**Lemma 13** Let $\sigma < \frac{1}{2}$. Society chooses $\ell = 1$ if the religious gap is sufficiently low.\(^{20}\)

It remains to consider intermediate levels of the religious gap. In one environment we know that $rl$ would vote for repression. This arises when $t(1) = 0$. In this case, liberties have no benefit for $rl$: one incurs the “psychological” externality cost, but there is no gain from tax revenues due to the higher productivity of the seculars. When $\sigma < \frac{1}{2}$, $t(1) = 0$ arises when both $t_{sl}(1) = t_{rh}(1) = 0$ (as any positive tax will get the support of the $rl$ and thus a majoritarian coalition will impose it). This arises when either (i) $\pi_r > \pi_w > \frac{(\sigma_\pi_r + 1 - \sigma)p}{1 - (1 - p)(\sigma_\pi_r + 1 - \sigma)}$, or (ii) $\pi_r < \pi_w < \frac{\pi_r - p(\sigma_\pi_r + 1 - \sigma)}{(1 - p)(\sigma_\pi_r + 1 - \sigma)}$. Note that these conditions are easiest to satisfy when $\pi_r = \pi_w$, and hold if and only if $\pi_r < \frac{p(1 - \sigma)}{(1 - p)\sigma}$. It is only when the economic and religious gap are sufficiently similar and not too high that both the $rh$ and $sl$ would want zero taxation.

In this case, in which $t(1) = 0$, we know that $rh$ becomes pivotal. The choice for $rh$ is either to benefit from the suppression of liberties but at the price of being subject to a high tax, or, “suffer” liberties and have little or no taxation. We then have:

**Lemma 14** Let $\sigma < \frac{1}{2}$ and $\pi_w$ be sufficiently similar to $\pi_r$. Then whenever $\frac{p(1 - \sigma)}{(1 - p)\sigma} > 2$, there exist $\hat{\pi} \in \left[2, \frac{p(1 - \sigma)}{(1 - p)\sigma}\right]$, such that $\ell = 1$ when $\pi_r \in (2, \hat{\pi}]$ and $\ell = 0$ when $\pi_r \in \left(\hat{\pi}, \frac{p(1 - \sigma)}{(1 - p)\sigma}\right)$.

**Proof:** In Appendix I.

What is interesting in the result above is that the religious gap does not have to be too large for repression to arise. When the economic gap and the religious gap are on a par, and not too low, repression can arise too. The low productive religious group votes for repression to gain some redistribution, little as it may be, and lower psychological cost, while the high productive religious group votes for repression as the overall tax rate in this case is not too high and it can save on the psychological cost.

Let us now bring together the results obtained in this section.

\(^{20}\)Note that this is not necessarily the case for the $rl$ group who may have an incentive to reduce liberties in order to gain higher taxes in the case in which $t(1) < t_l(0)$. 

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Proposition 15  The political choice of liberties will be:

[i] \( \ell = 1 \) when the secular are in a majority, or when the religious are in a majority and (a) the religious gap is sufficiently small or (b) when the religious and economic gap are sufficiently similar and are sufficiently small.

[ii] \( \ell = 0 \) when the religious are in a majority and (a) the religious gap is sufficiently large or (b) the religious and economic gap are sufficiently similar and neither too large nor too small.

While, as expected, a high religious gap results in repression of liberties and a low one results in full liberties, repression can also arise for intermediate values of the religious gap whenever the economic gap is sufficiently similar to the religious one.

5.2.3 Repression and redistribution

To conclude this section, let us examine the relation between repression and taxes. We have seen that more religious societies can induce lower taxes—in accordance with the empirical evidence—due to two effects, depending on the initial level of religiosity. If the religious gap is not too high, we have full liberties and the \( sl \) is the pivotal group over taxation. In this case an increase in the religious gap induces lower taxes (as the \( sl \) becomes relatively richer). This can be seen in Figure 4. On the other hand, if the religious gap is sufficiently high, the \( rh \) is the pivotal group over taxation and imposes a high tax (\( t_{rh}(1) > t_{l}(0) \)). In this case an increase in the religious gap—which first increases taxation as \( rh \) become poorer—will at the end lead to repression of liberties and hence a reduction in taxes to \( t_{l}(0) \), as indicated by Lemma 12 and derived in the Example in the previous section. Thus, in the first case, lower taxes arise with higher religiosity in relatively secular societies due to the lower productivity of the religious individuals. In this case, the seculars are not willing to redistribute as they become richer.

In the second case, lower taxes arise with higher religiosity in relatively religious societies due to the externality effect of liberties. This effect leads to repression and a more equal distribution of income, which is naturally accompanied by lower taxes.

In some environments though, repression may be accompanied by higher taxes. As we see from Lemma 14, when both the religious and the economic gap are similar and small, we have full liberties and no taxation. A simultaneous increase in both of these gaps leads to repression, and positive taxes. Thus, the relationship between the religious and economic polarisation, liberties, and redistribution, is intricate. Still, as derived from Lemma 12 whenever society is religious enough, that is, has a religious majority and a large enough religious gap, further increases in religiosity will eventually lead to repression accompanied by lower taxes.
6 Discussion

Our discussion of the implications of the previous results considers two questions. The first one is to underline the conditions under which a country will widen or restrict individual liberties. The second question focuses on whether the elite might benefit from an increase in religiosity.

6.1 Individual liberties: widening and restricting

Over the past decades we have witnessed a significant widening of individual liberties in most OECD countries, but we are also observing restriction of liberties in others. As we have seen in our model, there are several factors determining the emergence or not of full individual liberties: the religious relative to the economic gap, as well as whether the secular or the religious are a minority. By Lemma 10 liberties can be widened if the seculars become a majority. However, it seems unrealistic to impute the movement towards more individual liberties to a majority turning secular. The International Social Survey Program (ISSP) religiosity module in the surveys 1991, 1998 and 2008 provides individual data on religious beliefs for 28 countries. In none of these countries the share of the individuals declaring themselves non-religious exceeded 25 percent. Hence, we focus here on the factors influencing the religious and the economic gaps.

Let us start with the religious gap $\pi_r$. We can think of changes in $x_r$ and changes in $\alpha$ as different ways of changing the depth of the religious cleavage. A wider distance between secular and religious values – an increase in $x_r$ – and higher intolerance towards what the others can do - an increase in $\alpha$ – both increase $\pi_r$. Each captures a different facet of religiosity. A more intense degree of personal religiosity with a high $x_r$ is compatible with tolerance with a low $\alpha$. For instance, a key distinctive feature of Protestantism at the time of the Reformation was the personal, direct communication with god, while in Catholicism such relation had to be mediated by the church. In the spirit of our model, Catholicism can to be thought of as having a higher $\alpha$ than the Protestant religion.

As according to the surveys the degree of individual religios-

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21 These countries are Australia, Austria, Chile, Cyprus, Czech Republic, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Latvia, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom and USA.

22 In the same line, fundamentalist Islam would have a high $\alpha$ as it wishes to turn every assertion in the Quran into a general law implemented by the state. In Judaism the view that even one deviant makes the entire community guilty can attribute to a high $\alpha$. 

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ity has not decreased, the modern deepening of the separation of state and religion in most western countries could be interpreted in the prism of our model as resulting from lower levels of $\alpha$. Suppose that we start with a society with a large religious gap and repression of liberties. Turning religiosity into a personal matter pertaining only to the private sphere – lowering $\alpha$ – turns even the religious individuals sympathetic towards individual liberties the value relatively more the resulting increase in aggregate productivity. Moreover, if the change is large enough to induce societies to widen liberties, it may further increase output by enhancing the effort incentives to the secular population. As in Weber (1904), our model explains the higher performance of Protestant countries but through a different channel: that of lowering $\alpha$.\footnote{Becker and Woessmann (2009) offer a related theory that is also based on the direct relationship with god, as in order to be able to read the scripts personally, Protestants increased their level of education.}

Let us now turn to the economic gap, $\pi_w$. The economic environment has also experienced profound changes that might have had a role in the current process of the widening of liberties. For most countries the skill premium, that is the economic gap $\pi_w$, has significantly increased. According to our results the effect on the level of liberties and taxation depends on whether such change has taken place in countries with a relatively low or a high religious gap. In countries with a low religious gap and hence full liberties, an increase in the economic gap will not change the occurrence of liberties. On the other hand, in countries with a high religious gap and repression of liberties, as follows from Lemma 12, a large enough increase in the economic gap may tip society towards widening liberties and possibly higher aggregate output.

### 6.2 Divide and rule: who gains from religiosity?

We now address the comparative statics analysis of who benefits and who is hurt by changes in religiosity, continuing with our four-groups model. This is particularly pertinent because the level of religiosity or the concern for what others might be doing can be influenced by culture, education, media and so on. A natural question to address is whether the elite in society (the highly productive agents, or possibly the secular productive agents) can alter economic outcomes and in particular lower redistribution by affecting religiosity (e.g., by influencing the share of the secular population $\sigma$ or the social dimension of liberties $\alpha$). This question has a Marxist flavour in the sense that higher religiosity may translate into lower demands for redistribution by the low income population.

We examine here the strategy of influencing the actual religiosi-
ity of individuals. Specifically, in the present exercise we keep the levels of individual religiosity but change the population share of the secular $\sigma$.

Consider the case in which the seculars are in a majority, and so we have full liberties and the tax that is chosen by the $sl$. As $\sigma$ increases, aggregate output increases, thus reducing the relative income of each $sl$ individual. This induces $sl$ to choose higher taxation. Clearly, the low income secular (as well as the low income religious) would benefit from increasing the size of the secular community (as aggregate productivity and taxation increases according to their preferences). But, is it also true of the high income secular? The secular will have an ambivalent valuation of the increase in secularism. They will share the positive effect of a larger tax base, but they will be hurt by higher taxation. We now formally examine whether the high income secular are interested in the extension of secularism.

**Proposition 16** Let $\sigma > \frac{1}{2}$. When the economic gap is not too large, the secular elite (weakly) prefer the minimum share of secular. In contrast, the low income groups prefer the largest share of secular population.

The intuition for this result is clear. Whenever there is religious homogeneity, either all secular or all religious, the only divide is class and the poor will impose high taxation. Hence, the elite will prefer the poor to be divided along religious lines so that their preferences for redistribution would be divided too. In this case the secular poor (who are pivotal) are relatively rich compared with the religious poor, and thus demand relatively low taxation. Therefore, our model suggests that, at variance from Marx’s tenet, the best environment from the elite’s point of view is not that all poor become religious, but rather that religiosity splits the poor in a way that redistribution demands are minimised.

### 7 Conclusions

Building on the model by Esteban, Levy and Mayoral (2015) we study the interplay of the economic and religious cleavages in determining the outcome of the political choice of redistribution and of the extent of liberties. Clearly most religions have a strong stand on prohibiting some individual activities. This ranges from what should not be eaten or drunk to who cannot be your partner or which gender is the dominant one. To the best of our knowledge, ours is the first formal analysis of individual religiosity and the legal regulation of individual liberties and the choice of taxation.
Besides the straightforward result that for deep religious cleavages individual liberties will be suppressed unless seculars are in a majority, our analysis yields a set of more nuanced results. Even when in a majority the religious population can choose liberties either when the religious gap is sufficiently small or when the two gaps are similar in size and not too wide. But if the religious cleavage is large relative to the economic cleavage, either because of intolerance or extreme religiosity, a religious majority will prefer suppression of liberties with low redistribution rather than higher taxation with liberties.

Our model also allows for an interpretation of the better economic performance of protestant countries which is different from the classic Weberian thesis. We highlight the fact that by focusing on the personal relationship with god, Protestantism developed a culture with lower intransigence with respect to what the other were allowed to do. This change was beneficial on two counts. First, accordingly with the model, the individual supply of effort would go up. Second, more tolerance made easier the widening of liberties. Of course, many liberties have had to wait for a few centuries, but some were widened earlier. The firm support of the individual, not subject any longer to the dictates of the religious hierarchy, or the more flexible attitude with respect to charging interests on loans, are early examples of lifting previous impositions. The widening of the individual liberties combined with lower intransigence increased the productivity of the economy.

Finally, we have also examined which social group benefits from the increase of the share of religious population. The view that religion is the opium of the masses is a classical Marxist point. We obtain instead that the situation that benefits most the elite is to have the low productivity population divided along religious lines. In this “divide and rule” way, the secular poor will demand less redistribution than in a situation with all poor being united, as the religious divide makes the pivotal secular poor relatively rich.

**Appendix I: Proof of Proposition 6**

We decompose the statement in the Proposition into the following statements and then prove them: (i) All secular agents prefer \( \ell = 1 \), where all \((w, x)\) such that \( x < 1 \) and \( w > \sqrt{E(w^2)} \frac{1+\rho}{2-x} \) prefer \( t = 0 \) and the rest prefer \( t > 0 \). (ii) Religious agents with \( w > \sqrt{E(w^2)} \frac{1+\rho}{1-\left(x-\frac{\rho}{1+\left(x-\frac{1}{1-x}\right)}\right)} \) prefer \( \ell = 0 \) and \( t = 0 \). For these define \( x(w) = 1 \). Those with \( w \in [\sqrt{E(w^2)}, \sqrt{E(w^2)} \frac{1+\rho}{1-\left(x-\frac{\rho}{1+\left(x-\frac{1}{1-x}\right)}\right)}] \) and \( x > \hat{x}(w) \) for some \( \hat{x}(w) \) with \( \frac{\partial x}{\partial w} < 0 \) prefer \( \ell = 0 \) and \( t = 0 \) and otherwise they prefer \( \ell = 1 \) and \( t > 0 \). For these define \( x(w) = \hat{x}(w) \). (iii) Religious agents with
$w < \sqrt{E(w^2)}$ and $x > \hat{x}(w)$ prefer $\ell = 0$ and $t > 0$ and otherwise they prefer $\ell = 1$ and $t > 0$. For these define $x(w) = \hat{x}(w)$.

Now note that: (i) For all secular individuals, $\ell = 1$ is optimal as $\rho > 0$. Thus taxation is then determined as in Proposition 2 which is as described in part (i) of the Proposition.

(ii) For religious individuals with $w^2 > E(w^2)\frac{1+\rho}{1+(1-x)\alpha}$, we must have $t = 0$ as they would prefer 0 taxation for all levels of liberties. As $t = 0$, then $\ell = 0$ is optimal as well as it has no effect on proceeds from social output. Thus for these individuals $x(w) = 1$.

For all $E(w^2) < w < E(w^2)\frac{1+\rho}{1+(1-x)\alpha}$, for $\ell = 0$ the optimal $t$ is $t = 0$. These individuals then compare between $\ell = 1, t(1) > 0$ and $\ell = 0, t = 0$. We now define $x(w) = \hat{x}(w)$ which is the indifferent religiosity level between these two for each $w$ and show that it decreases in $w$. Note that $\hat{x}(w)$ solves $F(w, \hat{x}(w)) = 0$, where $F(w, x) = v_{w,x}(\ell = 1, t(1)) - v_{w,x}(\ell = 1, 0)$:

$$F(w, x) = \frac{1}{2}(1 - t(1))^2w^2[1 + (1 - x)\alpha]^2 +$$

$$+ t(1)(1 - t(1))E(w^2)[1 + \rho][1 + (1 - x)\alpha] - \frac{1}{2}w^2$$

where the first expression is the indirect utility from $\ell = 1, t(1)$ (where $t(1)$ is the optimal tax for this individual given full liberties) and the second one is the indirect utility from $\ell = 0, t = 0$. We will use the implicit function Theorem to identify $\hat{x}(w)$ and its properties.

It is straightforward to show that the higher is the level of religiosity (that is, when $x > \hat{x}(w)$), the more attractive is $\ell = 0, t = 0$. To see why, note that $\partial F/\partial t(1) = 0$ by the envelope theorem, and that $\partial F/\partial x < 0$. Thus there exists a unique $\hat{x}(w)$ satisfying indifference.

We now show that $\frac{dx(w)}{dw} < 0$. Using total differentiation, and using the envelope theorem which implies that the partial derivative with respect to the taxes is 0, we have that:

$$\frac{d\hat{x}(w)}{dw} = -\frac{\partial F}{\partial x}$$

Note that $dF/dx < 0$, and $\partial F/\partial w = \frac{1}{2}(1 - t(1))^2[1 + (1 - x)\alpha]^2 - \frac{1}{2} < 0$. Thus, $\frac{d\hat{x}(w)}{dw} < 0$.

(iii) Finally, for all $w^2 < E(w^2)$, for all levels of liberties we must have $t > 0$. These individuals then compare between $\ell = 1, t(1)$ and $\ell = 0, t(0)$ for the optimal $t$ as determined in (ii). We now define $x(w) = \hat{x}(w)$ for these individuals and show that it decreases in $w$. The only difference from the above is that now $F(w, x) = \frac{1}{2}(1 - \hat{t}(w))^2\hat{w}^2[1 + (1 - x)\alpha]^2 + \hat{t}(w)(1 - \hat{t}(w))E(\hat{w}^2)[1 + \rho][1 + (1 - x)\alpha] - \frac{1}{2}\hat{w}^2$.
$v_w(x, t(1)) - v_w(x, t(0))$ where $t(0)$ is the optimal tax for this individual given no liberties:

\[
F(w, x) = \frac{1}{2} (1 - t(1))^2 w^2 [1 + (1 - x) \alpha]^2 + t(1)(1 - t(1))E(w^2) [1 + \rho] [1 + (1 - x) \alpha] - \frac{1}{2} (1 - t(0))^2 w^2 + t(0)(1 - t(0))E(w^2),
\]

where the first expression is the indirect utility from $\ell = 1, t(1)$ and the second one is the indirect utility from $\ell = 0, t(0)$. To see that the higher is the level of religiosity (that is, when $x > \hat{x}(w)$), the more attractive is $\ell = 0, t(0)$, note that when we plug for $t(0)$, then:

\[
\frac{1}{2} (1 - t(0))^2 w^2 + t(0)(1 - t(0))E(w^2) = \frac{E^2(w^2)}{2E(w^2) - w^2}
\]

and thus the the second element in $F$ does not depend on $x$, whereas the first element decreases in $x$ as above.

Proof of Lemma 14: Note that the conditions set in the premise of the Proposition imply that $t(1) = 0$. For the vote for repression, we need to find out when

\[
\frac{1}{2} (1 - t_l(0))^2 w_h^2 + (1 - t_l(0)) t_l(0) E(w^2) > \frac{1}{2} w_h^2 (1 + (1 - x_r) \alpha)^2
\]

Plugging for $t_l(0)$, we need:

\[
\left( \frac{p + (1 - p) \pi_w}{2p + (1 - p) \pi_w - 1} \right)^2 \pi_w + 2(p + (1 - p) \pi_w - 1) > \left( \frac{\pi_r}{\pi_w} \right)^2
\]

Where if we impose $\pi_w = \pi_r = \pi$, then this holds for a high enough $\pi$. 

Proof of Lemma 12: Note that $v_{rh}(1, t_rh(1)) > v_{rh}(1, t_{rl}(1)) > v_{rl}(1, t_{rl}(1))$, where the second inequality follows from the fact that a higher wage always increases utility. Similarly we have that $v_{rh}(0, t_l(0)) > v_{rl}(0, t_l(0))$. Thus if $v_{rl}(0, t_l(0)) > v_{rh}(1, t_{rh}(1))$, 

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then both \( rl \) and \( rh \) vote for repression. Note that 

\[
2v_{rl}(0, t_i(0)) = \frac{E(w^2)}{2E(w^2) - w_i^2}, \quad \text{once we plug for the optimal tax, and similarly,} \quad 2v_{rh}(1, t_{rh}(1)) = \frac{E(w^2)(1 + \rho)^2(1 + (1 - x_r)\alpha)}{2E(w^2)(1 + \rho) - w_h^2(1 + (1 - x_r)\alpha)}. \]

Thus we have that

\[
\frac{E(w^2)}{2E(w^2) - w_i^2} > \frac{E(w^2)(1 + \rho)^2(1 + (1 - x_r)\alpha)}{2E(w^2)(1 + \rho) - w_h^2(1 + (1 - x_r)\alpha)} \iff \frac{1}{2E(w^2) - w_i^2} > \frac{(1 + \rho)(1 + (1 - x_r)\alpha)}{2E(w^2) - w_h^2(1 + (1 - x_r)\alpha)}
\]

But as \( \pi_w \leq \pi_r + 1 - \sigma \) or in other words \( w_h^2 \frac{(1 + (1 - x_r)\alpha)}{1 + \rho} < w_i^2 \), and thus the above holds if

\[
\frac{1}{2E(w^2) - w_i^2} > \frac{(1 + \rho)(1 + (1 - x_r)\alpha)}{2E(w^2) - w_h^2(1 + (1 - x_r)\alpha)}
\]

which holds with the condition that \((1 + \rho)(1 + (1 - x_r)\alpha) < 1\), or written differently, \((\sigma\pi_r + 1 - \sigma)(1 + (1 - x_r)\alpha)^2 = (\sigma\pi_r + 1 - \sigma)\frac{(2 - x_r)^2}{\pi_r^2} < 1\). Note that this holds whenever \((\sigma\pi_r + 1 - \sigma)\frac{4}{\pi_r^2} < 1\), which holds if \( \pi_r > 2\sigma + \sqrt{\sigma^2 - \sigma + 1} \).

**Proof of Proposition [16]**: Differentiating the indirect utility with respect to \( \sigma \) we obtain

\[
\frac{dv_{si}}{d\sigma} = \frac{dv_{si}}{dp} \frac{dp}{d\sigma} + \frac{dv_{si}}{dt} \frac{dt}{d\sigma}, \quad i = l, h.
\]

For the \( sl \), by an envelop argument \( \frac{dv_{si}}{dp} > 0 \) for \( i = l, h \). Hence, the \( sl \) always prefer to increase \( \sigma \).

**Proof.** For the \( sh \) the two terms have different sign. Developing the second term we can write

\[
\frac{dv_{si}}{d\sigma} = \left\{ \frac{dv_{si}}{dp} + \frac{dv_{si}}{dt} \frac{dt}{dp} \right\} \frac{dp}{d\sigma}.
\]

Note that \( \frac{dp}{d\sigma} > 0 \), and thus we want to know when \( \frac{dv_{si}}{dp} + \frac{dv_{si}}{dt} \frac{dt}{dp} < 0 \). This arises when

\[
\frac{dv_{si}}{dp} + \frac{dv_{si}}{dt} \frac{dt}{dp} = 2t_{sl}(1) - t_{sl}(1))E(w^2)
\]

\[
+ (-t_{sl}(1)(4w_h^2 + (1 - 2t_{sl}(1))E(w^2)(1 + \rho)) \frac{2E(w^2)w_i^2}{(2E(w^2)(1 + \rho) - w_i^2)^2}
\]

\[
< 0
\]

Plugging for \( t_{sl}(1) \), this simplifies to

\[
E(w^2)(1 + \rho) - 2w_i^2 + \frac{w_i^2(w_i^2 - 2w_h^2)}{E(w^2)(1 + \rho) - w_i^2} < 0
\]
which holds whenever (letting $\rho$ be at its maximum level of 1):

$$\frac{2(E(w^2) - w_1^2)}{w_1^2} < \frac{2w_h^2 - w_l^2}{2E(w^2) - w_l^2}$$

for which $2E(w^2) < 3w_1^2$ or $\pi_w < \frac{1}{2p} + 1$ is a sufficient condition. Note that if the tax imposed is 0, then the $sh$ are indifferent in terms of changing $\sigma$ as long as $tsl(1)$ remains 0, but if the increase in $\sigma$ is sufficient to cross the threshold to make $tsl(1) > 0$, then it lowers the utility of the $sh$ as before the change they were at their ideal policy. Thus whenever $\pi_w < \frac{1}{2p} + 1$, the $sh$ at least weakly and sometimes strictly (when $\pi_h$ is not too small so that taxes are positive or right before the threshold), prefer to decrease $\sigma$.

Appendix II: Correlation between religiosity and productivity

In our model we have assumed that there is independence between religiosity and productivity. Our analysis revealed though that religious agents—as long as there are some liberties—are poorer than the secular ones for the same level of productivity. If productivity is a result of an investment we should expect, in the long term, that religiosity would be correlated with low productivity levels.

To illustrate, consider now a model with just two groups of agents, low productivity religious agents and high productivity secular agents ($rl$ and $sh$). How will the results of the political model change?

Economic polarisation is larger for any $\ell$, which implies that the tax demanded is

$$t_{rl}(\ell) = \frac{(1 - \sigma) + \sigma \frac{w_l^2}{w_1^2} [1 + (1 - x_s)\ell] - [1 + (1 - x_r)\alpha\ell]}{2\left[(1 - \sigma) + \sigma \frac{w_l^2}{w_1^2} [1 + (1 - x_s)\ell] - [1 + (1 - x_r)\alpha\ell]\right]}.$$ 

which is higher than the tax demanded by $rl$ when there are four groups, and thus higher than the tax determined by the political system (which is $t_{rs}(\ell)$ or $t_{rh}(\ell)$).

Note that there are therefore two effects when the distribution generally shifts from low productivity secular agents to low productivity religious agents. First, the output decreases as the religious agents have less incentive to work. Second, the political power (the median voter) shifts towards the low productivity religious agents. At the extreme, if indeed all low productivity agents are religious, they have the majority and hence they would determine the tax according to their will. In our model it implies that when society shifts from having a few low productivity secular
agents to none, then the incentives of the low productivity religious agents to reduce liberties is actually reduced, as the social output is hardly affected but they now determine the tax rate for any level of liberties. This “decision power” increases their utility. Thus, counterintuitively, there would be less pressure for the reduction of liberties.

References


