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Tax Morale, Fiscal Capacity, and Wars*

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Abstract

This paper studies how mobilization for war motivates citizens to contribute to their own community and therefore help forming tax morale in a constituency. We derive a theoretical model to investigate government's decision to expand tax revenues from alternative sources, namely changing the country's culture of tax compliance or expanding fiscal capacity. Despite the two are initially substitute, we show how in equilibrium dynamic complementarity arises. Our mechanism exploits exogenous variation in the cost of tax morale formation, induced by an expected war (either internal or external) that makes easier for the government to mobilize the constituency. We motivate our theory through a novel cross-country analysis that uses information on war frequency, tax morale, and fiscal capacity. We additionally discuss some historical cases consistent with our mechanism.

Keywords: tax morale, state capacity, external threat, civil wars, dynamic complementarity, culture and institutions.

JEL Classification: P16, H11, H26, H41.

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1 Introduction

In recent years several works have analyzed the effects of wars on fiscal capacity, namely the capacity of the states to raise taxes and provide public goods. Following the insights of Tilly (1990), who argues that the European states had developed their fiscal infrastructures to deal effectively with external threats, Besley and Persson (2008, 2009) find that fighting external wars is conducive to building legal and fiscal capacity (in short, state capacity). The idea behind the relationship between wars and state capacity is that in presence of an external threat, common interest public goods, such as defense, become more valuable and this makes it optimal setting up an infrastructure for raising the resources to finance it. Others have highlighted that the effect of military competition on state capacity may not be always positive however; Gennaioli and Voth (2015) for example show that this is the case only when money is important for military success.

While high fiscal capacity requires high rates of tax compliance by citizens, another strand of the literature has pointed out that compliance rates cannot be fully explained by the level of enforcement and that tax morale, namely the intrinsic motivation to pay taxes, is instead a key determinant of tax compliance (Andreoni et al., 1998; Torgler, 2007; Luttmer and Singhal, 2014). In other words, there is a vast consensus that the existence of a culture of compliance is essential for raising revenues in any country. While there is less consensus on the determinants of tax morale, the literature has identified in the perception individuals have about the government, the fairness of the tax schedule, culture and beliefs, as well as the presence of ethnic differences as important factors affecting the intrinsic motivation of citizens to pay taxes (Hofmann et al. 2008; Lago-Peñas and Lago-Peñas, 2010; Halla, 2012; Belmonte et al., 2016). Some more recent works (Feldman and Slemrod, 2009; Konrad and Qari, 2012) have also argued that patriotism and citizens mobilization for a common cause can be an important determinants of tax compliance.

In this paper, we study how mobilization for war motivates citizens to contribute to their own community and therefore help forming tax morale in a constituency. We study governments' decision to invest in tax morale formation and fiscal capacity expansion in wartime and peacetime and characterize dynamic complementarity between the two sources of tax collection. The basic idea of our model is that war reduces the cost of tax morale formation through mobilization fostering changes in tax compliance culture when fiscal capacity is already consolidated. The increase in revenues allows the government to meet military requirements and push the menace away.

Specifically, we develop a model where agents produce and pay taxes to finance the provision of public goods. Producers can evade taxes and, in this case, they are detected (and sanctioned) with some probability that depends on the fiscal capacity of the state. When evading taxes, individuals may also suffer a utility loss depending on their degree of tax morale. Higher tax compliance and a consolidated fiscal capacity therefore helps governments in rising tax revenues. In wartime the government chooses the optimal provision of military resources, given its level of tax revenues. If fiscal capacity and tax morale are insufficient for raising the level of revenues required to finance the military facing the threat, then the government also invests resources to finance to increase fiscal capacity and/or tax morale.

We characterize the equilibrium of the model and describe possible dynamics of fiscal capacity and tax morale under different scenarios. Our results show that while fiscal capacity and tax morale are substitutes, wars may lead to an increase in tax morale when fiscal capacity is already relatively high. Our theory highlights two opposite mechanisms through which war may or may not engender tax morale. First, the exposure to a war has a disruptive effect on values and on tax morale. Second, warfare may help a community to overcoming the collective action problem and, by this mean, to trigger the transmission of these values that correlate with a culture of tax compliance. We show that the first effect dominates when fiscal capacity is low, while the second effect outweighs the first one when fiscal capacity in high.

This result is consistent with a debate that economists led at the juncture of the 19th and the 20th century to explain the victory of Unionists over Confederates in the American Civil War (Hill, 1894; Dingley, 1899; Lerner, 1955). Common to the debate was the acknowledgment of the chief role of the "*ability and disposition [of the state] to draw from abundant revenue to support the government*" (Dingley, 1899). At the outbreak of the conflict, Unionists not only had an institutional advantage in collecting taxes,[1] but established a sophisticated propaganda campaign to market almost $3 billions of bonds that saw a decisive participation of the citizenry. The South lacked a well established fiscal capacity to levy or collect internal taxes and war expenses were mostly met by indirect and trade taxes, printing of money, and loans that however only earned $115 million in total (Burdekin and Langdana, 1993).

The success of the Northern bond market was unprecedented and for several scholars it represented one of the root of the subsequent famous wartime sacrifice that has largely characterized the history of the United States in the 20th century (Jones, 1988, 1996; Bank, Stark, and Thorndike, 2008). The American experience is however not unique and the relationship

[1] In 1861 the Union government enacted the *Revenue Act* that imposes the first income tax in the country at a flat rate of 3% on incomes above $800 (see Hill, 1894).

between war, fiscal capacity, and tax morale quite general. In the last part of the paper, we show that by collecting a unique dataset that retraces the history of the fiscal capacity and the war frequency of 61 countries from the 1939. We have then matched this information with today's survey data on tax morale from the World Value Survey (WVS). Our estimates show a positive correlation between war and tax morale only in countries with a relatively high fiscal capacity; in countries with limited fiscal capacity, we rather find a negative association between war and tax morale. These results hold both for external as well as for civil wars and are robust to several measures of fiscal capacity proposed in the literature. They suggest that past exposure to conflicts favored a culture of tax compliance only when such investment is accompanied by a concomitant expansion of fiscal capacity.

Our paper connects with several strands of literature. The paper relates to the literature on state capacity (e.g., Besley and Persson, 2008; Acemoglu, Ticchi and Vindigni, 2011) and with that on tax morale discussed above.[2] Our work is at the best of our knowledge the first which combines the two fields, studying how fiscal capacity expansion compelled by a threat of war can additionally induce the government to engage in mobilization and in tax morale formation.[3] It also differentiates with the first strand of literature in several respects. For example, we find that a threat of an external war is not necessarily conducive of an expansion of fiscal capacity. This equilibrium occurs when tax morale is low so that rising revenues through a fiscal capacity expansion turns to be too costly. Beside, unlike some earlier findings (e.g., Besley and Persson, 2008), in our framework civil wars might not necessarily have negative effects on state capacity. Indeed, we obtain that also civil wars may conduce to tax morale in presence of sufficiently large fiscal capacity.

This latter result is consistent with the work of Acemoglu, Ticchi and Vindigni (2010) who argue that civil wars may persist if the government does not invest enough resources in military capacity for the fear of a takeover of the army; only in such circumstances the persistence of internal conflicts is detrimental for tax morale, while civil wars might foster tax morale if the government invests enough resources in repression and in mobilizing citizens.

Finally, this paper is related to the recently growing literature on the effects of the joint interaction between culture and institutions on economic outcomes (see Ticchi, Verdier and Vindigni, 2013; Gorodnichenko and Roland, 2016).

[2] In addition, this paper is also related to the works by Michalopoulos and Papaioannou (2013) and Dincecco and Katz (2014), who study the long-run effects of fiscal centralization, and Dincecco and Prado (2012), who uses past external wars to select exogenous variation of fiscal capacity on current GDP.

[3] For an example of how mobilization due an external threat may affect political institutions see Ticchi and Vindigni (2008).

The paper is organized as follows. Section 2 describes the framework and analyzes the equilibrium of the game. Section 3 extends the analysis to a dynamic setting. In Section 4 we present our empirical findings. Section 5 concludes.

2 The Basic Model

2.1 The Framework

We consider an economy populated by a continuum of agents of measure one living for two periods, $t \in \{1, 2\}$. There are N groups in the population and each member of group $j \in \{1, ..., N\}$ has income Y^j and size n^j. Average and total income in the economy is equal to $Y = \sum_{j=1}^{N} n^j Y^j$. The government finances its expenditures by imposing a proportional taxation at rate τ; taxation does not create distortions for all $\tau \leq \hat{\tau}$, while distortions are prohibitively high for $\tau > \hat{\tau}$. In each period, individuals decide whether to pay taxes or not; $\xi_{i,t}^j \in \{0, 1\}$ is an indicator function denoting whether individual i of group j has evaded taxes ($\xi_{i,t}^j = 0$) or not ($\xi_{i,t}^j = 1$) at time t; as we shall assume no heterogeneity within groups, all agents in a given group j will make the same decisions and, therefore, we can employ the indicator function $\xi_t^j \in \{0, 1\}$. The government might use the revenues $T = \sum_{j=1}^{N} \xi^j \tau n^j Y^j$ for the provision of a public good, Q, that benefits equally all the citizens, such as national health system, and for financing the military expenditure, G, to deal with internal or external threat. We assume that the same group remains in power in both periods and that agents do not discount utility.

The existence of a threat is publicly revealed at time $t = 1$ and the conflict takes place only in the second period; μ and ν are two indicator functions; $\mu \in \{0, 1\}$ denotes the existence of a threat ($\mu = 1$) or not ($\mu = 0$) at time 1, and $\nu \in \{0, 1\}$ denotes the choice of the government at time 2 to fight ($\nu = 1$) or not ($\nu = 0$) the enemy. Fighting an internal or external threat is a public good which provides a utility to each citizens of group j equal to $\alpha^j \gamma G^\beta$, where $\alpha^j > 0$ represents the weight attached by each agent to this public good and $\gamma \geq 0$ captures the level of the threat. G is the level of security the government aims to provide to citizens (e.g., the probability of defeat the foreign enemy or the rebels) and β is its elasticity. We assume that $\beta < 1$ so that G delivers a decreasing marginal return. Likewise, θ is the elasticity from the public good Q and we assume for simplicity $\theta < 1$. This yields the following two periods quasi-linear utility function for each individual i of group j:

$$(1 - \tau_1)Y^j + (1 - \tau_2)\, Y^j + \mu\gamma\alpha^j G^\beta + (1 - \mu)Q^\theta. \tag{1}$$

Individuals hence derive utility from a two periods flow of post-tax income and from the

provision of the public good G in war times (i.e., $\mu = 1$) and from Q in peace times (i.e., $\mu = 0$). Finally, we assume that the military technology is such that unit of government resources can be transformed into one unit of G.

When individuals evade taxes they bear a utility cost $M \geq 0$ which depends positively on their level of tax morale. Tax evaders get caught with probability p and, in this case, they pay a sanction S; therefore the expected sanction is $E = pS$; as we will see, this is a measure of fiscal capacity of the state. In the first period of time, fiscal capacity and tax morale are exogenously given at levels $E_1 = p_1 S_1$ and $M_1 \geq 0$. However, the government can invest resources to increase fiscal capacity and tax morale in the subsequent period.

The cost of increasing the level of fiscal capacity is $H(\Delta E)$, where $\Delta E = E_2 - E_1$, and with $H'(\cdot) > 0$, $H''(\cdot) > 0$, and $H(0) = 0$. The cost of increasing tax morale is $C(\Delta M; \nu)$, where $\Delta M = M_2 - M_1$, and with $C(\cdot)$ increasing and convex in ΔM. We also assume that the cost of increasing tax morale is lower when there is an internal or external threat and the government decides to fight it ($\nu = 1$), i.e. $C(\Delta M; 1) < C(\Delta M; 0)$ and $C'(\Delta M; 1) < C'(\Delta M; 0)$. The idea behind this assumption is that mobilization of citizens to fight an enemy helps create a sense of national identity that allows the government to increase tax morale at lower costs than in peace times.

We normalize to zero the per-period cost of a certain level of fiscal capacity and focus only on the cost of increasing it. Similarly, we assume that the sanctions levied are dissipated and do not go in the government budget. Finally, we ignore the fact that mobilization against the threat could generate an increase in tax morale among citizens at zero costs. Considering all these features would complicate our analysis without affecting our results.

2.2 Timing of Events

The game is played along two periods. The timing of events in period 1 is the following.

1. Individuals receive their income;
2. the existence of a threat $\mu \in \{0, 1\}$ for period 2 is revealed;
3. the government decides fiscal policy, the level of investment in fiscal capacity and tax morale and sets the tax rate accordingly, i.e. $\{\tau_1, \Delta E, \Delta M\}$;
4. individuals decide whether to pay or to evade taxes, $\xi_1^j \in \{0, 1\}$;
5. the bureaucratic apparatus of the state checks whether citizens have paid taxes or not, imposes the sanctions, and implement the fiscal policy.

The timing of events in period 2 is the following.

1. Individuals receive their income;
2. the government decides whether to fight or not the threat if this exists, $\nu \in \{0,1\}$, and sets its fiscal policy accordingly;
3. individuals decide whether to pay or to evade taxes, $\xi_2^j \in \{0,1\}$;
4. the bureaucratic apparatus of the state checks whether citizens have paid taxes or not, imposes the sanctions, and implement the fiscal policy.

In the next section, we characterize the equilibrium of the game just described by focusing on pure strategy Markov Perfect Equilibria (MPE). Recall that an MPE is defined as a set of Markovian strategies that are best responses to each other given every history; Markovian strategies condition only on the payoff-relevant state variables and on the prior actions within the same stage game.

2.3 The Equilibrium

We solve the equilibrium by backward induction starting from period 2 and first consider the case where income redistribution is not possible when there is a threat.

We start by determining under which conditions the individuals pay taxes in period $t \in \{1,2\}$. The utility from paying taxes is $(1-\tau_t)\,Y^j$ while the expected utility of evading it is $Y^j - M_t - E_t^j$. Therefore, agents in group j pay taxes when

$$\tau_t Y^j \leq M_t + E_t^j, \tag{2}$$

which clarify how the capacity of the state to raise revenues (the LHS of (2)) is determined by the capacity of the bureaucratic apparatus of the state (which determines E_t^j) and the tax culture of citizens (M_t). To avoid that constraint (2) holds only for some groups and not for others, which could lead to a strategic choice of the government to allow some groups to avoid taxes, we assume the existence of a linear relationship between Y^j and E^j so that the *paying taxes constraint* (2) either holds for all groups or not.[4] This implies that the constraint reduces to $\tau_t Y \leq M_t + E_t$.

The paying taxes constraint (2) also makes clear that the level of taxation may not be a precise proxy for the capacity of the state to raise revenues or, better, that such a capacity is

[4] Allowing some groups to avoid taxes is equivalent to assuming selective income redistribution among groups, which is a feature that complicates the analysis without providing interesting insights for our theory.

the result of the structure and efficiency of the bureaucratic apparatus of the state *and* of the tax culture of citizens that, as now show, can be molded by the state. This is the reason why we distinguish here between fiscal capacity and tax morale.

Let us assume that group j is in power and decides the government policy in both periods. Hence, the government solves the following maximization problem

$$\max_{\{\tau_1,\tau_2,G,Q\}} \quad (1-\tau_1)Y^j + (1-\tau_2)\,Y^j + \mu\gamma\alpha^j G^\beta + (1-\mu)Q^\theta, \tag{3}$$

subject to the government budget constraints in the two periods respectively given by

$$\tau_1 Y = C\left(\Delta M;\nu\right) + H\left(\Delta E\right), \tag{4}$$

$$\tau_2 Y = \mu G + (1-\mu)Q, \tag{5}$$

and the paying taxes constraint (2) for both periods.

2.3.1 Wartime

Let us first consider the case where there is a threat ($\mu = 1$) so that $\gamma > 0$. Substituting (2), (4) and (5) into (3), and taking into account the paying taxes constraint (2) for period 2 that will hold with equality sign in equilibrium (i.e., $E_2 = \tau_2 Y - M_2$), allows us to rewrite the maximization problem as follows

$$\max_{\{\tau_2,M_2\}} \quad Y^j - \frac{Y^j}{Y}\left[C\left(M_2 - M_1;\nu\right) + H\left(\tau_2 Y - M_2 - E_1\right)\right] + (1-\tau_2)\,Y^j + \alpha^j\gamma\tau_2^\beta Y^\beta. \tag{6}$$

The first order conditions with respect to τ_2 and M_2 are respectively:

$$Y^j H'\left(\tau_2 Y - M_2 - E_1\right) - Y^j - \alpha^j\gamma\beta\tau_2^{\beta-1}Y^\beta = 0, \tag{7}$$

$$\frac{Y^j}{Y}\left[C'\left(M_2 - M_1;\nu\right) - H'\left(\tau_2 Y - M_2 - E_1\right)\right] = 0. \tag{8}$$

Rearranging terms in these two expressions, we obtain that the optimal tax rate τ_2^* in period 2 and tax morale M_2^* are defined by the following system of equations:[5]

$$\left[1 + H'(\tau_2^* Y - M_2^* - E_1)\right]Y^j = \alpha^j\gamma\beta(\tau_2^*)^{\beta-1}Y^\beta \tag{9}$$

$$C'\left(M_2^* - M_1;\nu\right) = H'\left(\tau_2^* Y - M_2^* - E_1\right). \tag{10}$$

Equation (9) tells us that in equilibrium the marginal benefit, on the RHS, must equalize the marginal cost, on the LHS, of increasing taxes in period 2. Equation (10) additionally states

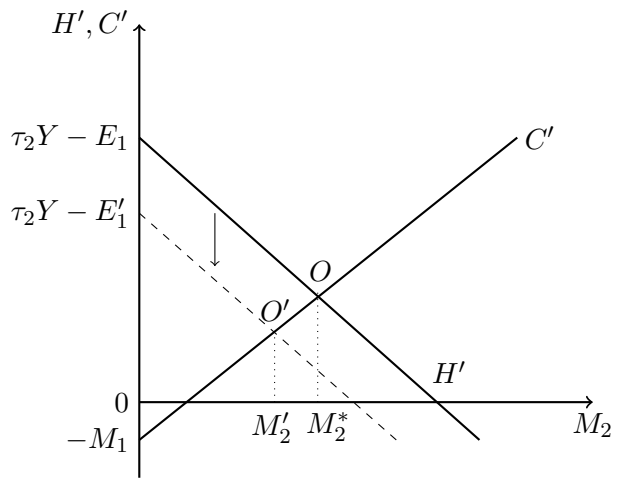

Figure 1: The equilibrium condition of the expansion cost of the two fiscal instruments.

that in equilibrium the two instruments, tax morale and fiscal capacity, to expand taxes must be equally costly at the margin.

To further clarify the mechanism at work, Figure 1 illustrates the equilibrium value of tax morale in period 2, M_2^*, obtained when the marginal cost of expanding tax morale, $C'(\Delta M)$, intersects from below the marginal cost of expanding fiscal capacity, $H'(\Delta E)$. Notice that when $M_2 < M_2^*$ the cost of enlarging the bureaucratic apparatus outweighs at the margin the cost of mobilizing tax payers. Likewise, when $M_2 > M_2^*$ expanding tax morale is more costly at the margin. The equilibrium is therefore the optimal allocation of resources that permits to achieve the highest level of tax revenues.

By the same token, it is intuitive to show that a state with an initially higher level of fiscal capacity, say E_1', can reach an equilibrium characterized by a lower level of mobilization, $M_2' < M_2^*$. An initial higher level of E_1, in fact, permits the state to obtain the same expansion of fiscal capacity between the two periods up to E_2 in a less costly way. Graphically, the line H' shifts backward and the new intersection point, O', gives the new optimal level of mobilization M_2'.

Residually, from $(\tau_2^*; M_2^*)$ we obtained the optimal level of fiscal capacity as

$$E_2^* = \tau_2^* Y - M_2^*, \tag{11}$$

and the optimal level of public good provided as $G^* = \tau_2^* Y$. From the government budget constraint (4) it follows that the tax rate required to finance the investments in fiscal capacity

[5]Second order condition holds from the assumption of convex costs, i.e. $H''(\cdot) > 0$ and $C''(\cdot) > 0$. $\beta < 1$ guarantees a global maximum.

and in tax morale in period 1 is

$$\tau_1^* = \frac{C\left(M_2^* - M_1; \nu\right) + H\left(E_2^* - E_1\right)}{Y}, \tag{12}$$

as long as τ_1^* and τ_2^* are both lower than $\hat{\tau}$, which we assume to be the case.[6] The following proposition summarizes the above results.

Proposition 1 *If the country faces a threat ($\mu = 1$) of level γ and the government attaches a marginal utility α^j to this public good, then the government's optimal policy is the set $(\tau_2^*; M_2^*; E_2^*; \tau_1^*)$ determined respectively by (9), (10), (11), and (12).*

It is immediate that higher weights attached by the government to defeat the enemy (i.e., higher α^j) and higher levels of threat (i.e., higher γ) imply a higher provision of G and, therefore, a higher tax rate τ_2^* necessary to finance it. This in turn requires high investments in fiscal capacity, $\Delta E = E_2^* - E_1$, and high investments in tax morale, $\Delta M = M_2^* - M_1$, that allow the government to collect the revenues necessary to finance the military.

2.3.2 Peacetime

We now compare the government's optimal policy set obtained in war times with that in which the government does not expect any threat of war. This would allow us to compare tax morale formation and fiscal capacity expansion in wartime and in peacetime. Recall that in peace times $\mu = 0$. Henceforth (3) reduces to

$$\max_{\{\tau_1, \tau_2, Q\}} \; (1 - \tau_1) Y^j + (1 - \tau_2) Y^j + Q^\theta, \tag{13}$$

whereas the government budget constraint to $\tau_2 Y = Q$. The first order conditions with respect to τ_2 and M_2 are respectively:

$$Y^j H'\left(\tau_2 Y - M_2 - E_1\right) - Y^j - \theta \tau_2^{\theta-1} Y^\theta = 0, \tag{14}$$

$$\frac{Y^j}{Y}\left[C'\left(M_2 - M_1; \nu = 0\right) - H'\left(\tau_2 Y - M_2 - E_1\right)\right] = 0. \tag{15}$$

We can therefore obtain the optimal tax rate $\tilde{\tau}_2$ in period 2 and tax morale $\tilde{M}_2$ in peacetime as

$$\left[1 + H'(\tilde{\tau}_2 Y - \tilde{M}_2 - E_1)\right] Y^j = \theta(\tilde{\tau}_2)^{\theta-1} Y^\theta \tag{16}$$

[6] If τ_1^* and/or τ_2^* are higher than $\hat{\tau}$, then the solution to problem (3) involve some corner solutions. We do not discuss this case here because it would only complicate the comparative statics analysis without providing further insights. We do not consider either the case where the optimal tax rate in the second period is such that the paying taxes constraint (2) is not satisfied without investments in fiscal capacity or tax morale, i.e. $\tau_2^* Y > M_1 + E_1$, as otherwise the problem is not of interest for our theory.

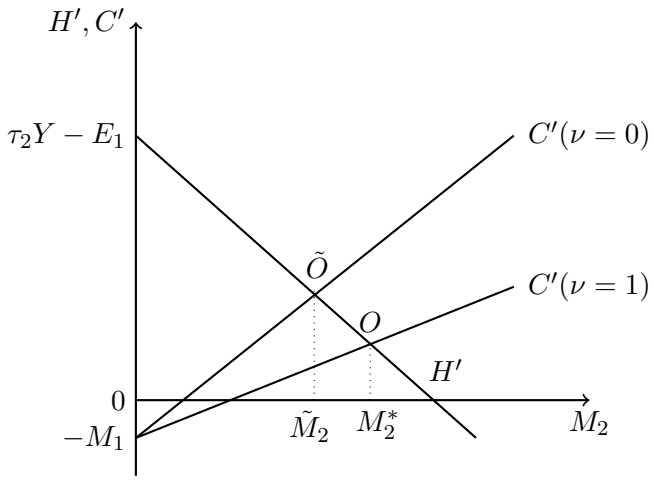

Figure 2: The equilibrium condition of the expansion cost of the two fiscal instruments in wartime and peacetime.

$$C'\left(\tilde{M}_2 - M_1; \nu = 0\right) = H'\left(\tilde{\tau}_2 Y - \tilde{M}_2 - E_1\right), \tag{17}$$

and residually $\tilde{E}_2 = \tilde{\tau}_2 Y - \tilde{M}_2$.

Figure 2 illustrates the equilibrium in peacetime, $\tilde{M}_2$, obtained when the marginal cost of expanding tax morale, $C'(\Delta M, \nu = 0)$, intersects from below the marginal cost of expanding fiscal capacity, $H'(\Delta E)$, and compares it with the equilibrium obtained in wartime, M_2^*. As Figure 2 shows, people mobilization is less costly at the margin when the state engages in a war ($\nu = 1$). Graphically, we have that C' rotates backward moving the equilibrium from $\tilde{M}_2$ to M_2^*, with $\tilde{M}_2 < M_2^*$. Intuitively, at each level of M_2, the marginal cost of increasing tax morale in peace times is larger than in war times, $C'(\Delta M; 1) < C'(\Delta M; 0)$, so that a comparison of equation (17) and equation (10) yields that the government finds it optimal in peacetime to pursue its capacity to raise revenues by a large increase in fiscal capacity (ΔE) and a relatively smaller increase in tax morale (ΔM).

The following lemma summarizes these results.

Lemma 1 *High threats (γ) leads to a large expansion of government revenues (τ_2^*) that are implemented through a large expansion of fiscal capacity (ΔE^*) and tax morale (ΔM^*). In peace times ($\nu = 0$), the same increase in revenues (i.e., the same level of τ_2^*) is instead implemented through a larger increase in fiscal capacity and a smaller increase in tax morale.*

3 Coevolution of tax morale and fiscal capacity

The previous set-up can be easily expanded to describe the coevolution of fiscal capacity and the culture of tax compliance. To this end, we now consider an economy populated by a countable infinity of non-overlapping generations of citizens. Each generation is constituted by a continuum of agents of measure one who live for two sub-periods. In each of the two sub-periods, events and actions are those described in Section 2.1. We refer to the timescale in which a generation is born and dies as t.

3.1 Socialization and transmission of tax morale across generations

At the end of the second sub-period (before dying), parents decide the effort in socialization, $\delta \in [0,1]$, that they use to transmit their level of tax morale, M_t, to their offspring.

Socialization has costs and benefits. When parents exert an effort equal to δ, they bear a cost equals to $K(\delta; E_t)$ and add δM_t units of tax morale to their children with respect to a baseline level of tax morale $\underline{M}$. In particular, we assume that the socialization technology is more efficient when fiscal capacity is high: $K(\delta; E_t'') < K(\delta; E_t')$ for any $E_t'' > E_t' \geq 0$. The idea is that convincing children that cheating on taxes is bad is easier when the state itself invests in fiscal capacity and therefore rents from tax evasion are more limited. We also assume that socializing children is less costly at the margin when fiscal capacity E_t is higher (i.e., $K'(\delta; E_t'') < K'(\delta; E_t')$) and becomes unaffordable when the state has no fiscal capacity (i.e., $K'(\delta; E_t = 0) = +\infty$). When parents do not transmit their values in complying with taxes (i.e., $\delta = 0$), the young generation obtains a tax morale $\underline{M} \equiv \underline{M}(\gamma) > 0$, with $\underline{M}'(\gamma) < 0$ capturing the idea that the experience of a war and more external threat may have a disruptive effect on the baseline level of such values in the society. An effort equals to δ adds δM_t units of tax morale to their children. The utility derived by parents from transmitting tax morale to their offspring is $V_t^s(\gamma)$; we assume that this utility is higher when parents have been exposed during their life to a war, i.e. $\partial V_t^s(\gamma)/\partial\gamma > 0$. The idea is that war changes persistently parents' preferences for redistribution and helps overcoming collective actions problems making the transmission of tax morale more salient.

The evolution of tax morale across generations is therefore represented by the following equation:

$$M_{t+1} = \underline{M}(\gamma) + \delta M_t, \tag{18}$$

and the change of tax morale in the economy from generation t to generation $t+1$ is given by:

$$\Delta M_{t+1} \equiv M_{t+1} - M_t = \underline{M}(\gamma) + (\delta - 1)M_t. \tag{19}$$

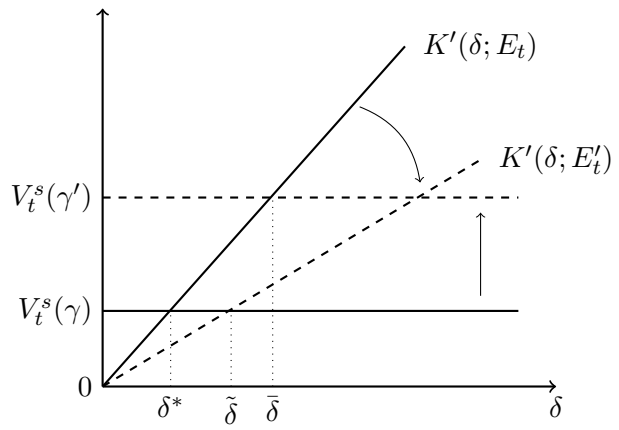

Figure 3: The optimal socialization effort δ^* and its variation due to an increase in fiscal capacity from E_t to E'_t or due to an increase in the intensity of the war threat from γ to γ'.

The effort of socialization is optimally decided in equilibrium by parents after solving the following maximization problem:

$$\max_{\delta} \quad \delta V_t^s(\gamma) - K(\delta; E_t), \tag{20}$$

and the first order condition of (20) yields the optimal socialization effort δ^* chosen by each individual of generation t:

$$V_t^s(\gamma) = K'(\delta^*; E_t). \tag{21}$$

Note that the marginal benefit from the socialization increases with the utility that parents attach to a son with a high level of tax morale which, in turn, increases with the exposure to warfare. On the other hand, the marginal cost reduces with the stock of fiscal capacity that the government has enacted to collect revenues and enforce the law. When the two are equals, parents optimally exert an effort equals to $\delta^*(\gamma, E_t)$.

In Figure 3, we illustrate the optimal effort of socialization. When the level of fiscal capacity in the economy is E_t, the optimal effort, δ^*, is obtained from the intersection between the flat line $V_t^s(\gamma)$, the LHS in equation (21), and the marginal cost $K'(\delta; E_t)$, the RHS in equation (21). Note that, as we illustrate in Figure 3, the optimal effort of socialization increases if fiscal capacity E_t is higher as well as if the intensity of the threat of war γ goes up. The first variation, from E_t to E'_t, generates a rightward shift in the marginal cost from $K'(\delta; E_t)$ to $K'(\delta; E'_t)$. As a result, the effort increases up to $\tilde{\delta}$ triggering the transmission of tax morale. The second variation, from γ to γ', generates an upward shift in the marginal benefit from $V_t^s(\gamma)$ to $V_t^s(\gamma')$, which generates an increase of the effort up to $\bar{\delta}$.

Substituting the optimal effort of socialization, $\delta^*(\gamma, E_t)$, into equation (18) yields the following equilibrium dynamics of tax morale from generation t to generation $t+1$

$$M_{t+1} = \underline{M}(\gamma) + \delta^*(\gamma, E_t)M_t, \tag{22}$$

which depends on the stock of fiscal capacity in the economy and on the level of threat.

3.2 The natural level of tax morale

At the steady state $\Delta M_{t+1} = 0$. From Equation (19), this implies that the steady state (or natural) level of tax morale $\hat{M}$ is as follows:

$$\hat{M} = \frac{\underline{M}(\gamma)}{1 - \delta^*(\gamma, E_0)}. \tag{23}$$

For any level of $\delta^*(\gamma, E_t) < 1$, the steady state level of tax morale in (23) is globally stable and, given the initial condition M_0, each economy converges to it. We summarize this result in the following proposition.

Proposition 2 *Denote $\underline{M}(\gamma)$ as the baseline value of tax morale of generation t. Given the initial conditions M_0 and E_0, the steady state level of tax morale $\hat{M}$ to which the economy converges is given by (23). It is unique and globally stable for any values of $\delta^*(\gamma, E_0) < 1$.*

3.3 Comparative statics on the steady-state

The natural value of tax morale strictly depends on the war exposition of generation t, γ, and on the level of fiscal capacity that the government has accumulated up to generation t, E_t. In particular, our theory highlights two opposing effects of war on tax morale: on one hand, war may have a disruptive effect on the baseline value of tax morale; on the other hand, an increase in the intensity of the war threat makes socialization more salient. A priori, the effect of war intensity on $\hat{M}$ is ambiguous. An increase in the stock of fiscal capacity generates an unambiguous positive effect on $\hat{M}$ by making socialization more efficient for parents. Variations in these two key parameters may generate change in $\delta^*(\gamma, E_t)$ and through this channel can explain variations in the natural rate of tax morale, $\hat{M}$.

To see that consider two extreme cases that capture a low and a large natural level of tax morale, respectively. First, note from equation (23) that if parents optimally decide to not carry on any socialization effort (i.e., if $\delta^*(\gamma, E_t) = 0$) the natural value of tax morale reduces to its baseline (i.e., $\hat{M} = \underline{M}(\gamma)$). Note that this is the case when E_t approaches to 0, so that the cost of socialization becomes unaffordable. In Figure 3 this situation is captured by a shift

to the left of the line $K'(\delta; E_t)$ that continues as long as $K'(\delta; E_t)$ leans on the y-axis. Note that if $E_t = 0$ then $\delta^*(\gamma, E_t = 0) = 0$ and $\hat{M} = \underline{M}(\gamma)$, regardless of whether generation t has been exposed to a war or not. The exposure to a war hence will solely produce a negative effect because of its disruptive power on values. Second, if parents optimally decide to fully socialize their children (i.e., if $\delta^*(\gamma, E_t) = 1$), tax morale continues to grow from generation to generation and the natural value of tax morale diverges to infinity. This corner solution arises when E_t is maximal, which makes the cost of socialization null and the line $K'(\delta; E_t)$ in Figure 3 flat along the x-axis.

For any interior solution of $\delta^*(\gamma, E_t)$, whether war generates a positive or a negative effect on tax morale depends on which of the two effects dominate between disruption of values and the overcoming of the collective action problem. In the following proposition, we show that there exists an intermediate value of fiscal capacity $E^\dagger > 0$ such that the disruption effect dominates on the positive one if $E_t < E^\dagger$, while the boost on socialization dominates the negative effect of the war on tax morale if $E_t \geq E^\dagger$.

Proposition 3 *Denote $\hat{M}(\gamma, E_t)$ as the steady state level of tax morale. There exists a value of fiscal capacity $E^\dagger > 0$ such that:*

- *If $E_t < E^\dagger$, then $\frac{\partial \hat{M}(\gamma; E_t)}{\partial \gamma} < 0$.*
- *If $E_t \geq E^\dagger$, then $\frac{\partial \hat{M}(\gamma; E_t)}{\partial \gamma} \geq 0$.*

In Section 4 we test this prediction of the theory.

4 Empirical evidence

In this section we present novel empirical evidence on the link between tax morale, fiscal capacity, and war. Our interest here is on the effect of war on tax morale. Our main innovation with respect to Feldman and Slemrod (2009) stands on pinning down heterogeneous effects of conflicts on tax compliance according to whether government invests in fiscal capacity or not. Additionally, our analysis differentiates from Feldman and Slemrod (2009) for employing a longer time horizon in war frequency and for putting emphasis on intrastate wars.[7] This approach allows us to shed light on the conducive role of wars, and in particular civil wars, for rising tax morale.

[7] As we shall explain below, we start counting wars and years under conflicts from the 1939—the year in which the WWII has its start. This approach is consistent with the so-called "*ratchet effect*" according to which a war experience persistently moves tax morale level upward and never returns to its starting level (e.g., Rasler and Thompson, 1985; Kiser and Linton, 2001).

4.1 Data and empirical strategy

Our empirical analysis uses a large set of variables whose descriptive statistics are reported in Table 1. First of all, we use information on tax morale from seven waves of the World Value Survey (WVS) and European Value Survey (EVS). The period we look at covers more than 30 years, from 1980 (first wave) to the 2012 (last wave). The two surveys ask the following question F116, on a 1-10 scale: "*Cheating on taxes, if you have a chance, is: 1 = never justifiable, 10 = always justifiable.*" We rescale it so that higher values of it correspond to a higher tax morale of the individual and compute weighted averages at country-wave level. Overall, we collect 199 data points across 61 countries. Tax morale ranges from 6.88 to 10, with higher values indicating a country with a population more willing to comply with taxes. The average level of tax morale is 8.76.

Secondly, from Correlates of Wars (COW) we use information on the number of wars fought by a given country and those disputed by the government within its territory against rebel groups after the start of the World War II.[8] Alternatively, we use information on same conflicts at the intensive margin, measuring wars through the number of years under an internal or an external war. On average, we count 1.28 wars fought by each country from 1939 to 2010. However, we observe a large variation across countries ($sd = 2.37$): Indonesia has fought 9 civil wars whereas the United States and China have combated 7 and 6 international wars respectively. Many others have never been involved in neither of the two. In terms of number of years under a conflict, we count 4.62 years on an average level, that in proportion means about 8% of wartime out of total time. Since several countries have embarked in endless wars in the last sixty years, these data account for a substantial variation ($sd = 9.21$).[9]

For measuring fiscal capacity we rely mostly on Besley and Persson (2009)'s version of the IMF data on taxes. These data are from 1975 onward. As in Besley and Persson (2009), we employ percentages of income taxes on GDP and percentages of total taxes on GDP. The idea behind the first measure is that income is difficult to tax unless the country makes investment in fiscal capacity. The second measure is intended as a "catch-all" measure of fiscal capacity. Besley and Persson's sample reports an average income tax rate of about 15%, with a maximum of 34.60%, and an average total tax rate of 26.62%, with a maximum of 50%. We also use

[8]The World War II represented a crucial shock for participating countries that forced them to mobilize citizens against the enemy. See, for example, Polenberg (1972) and Bank, Stark, and Thorndike (2008) on the United States experience. However, our results are also robust to the exclusion of the time-window 1939-1945.

[9]Philippines fought more than 40 years. First its government embarked in a 20 years civil wars (*guerilla*) against the New People's Army (1972-1992), then with a minoritarian Muslim group, the Moro population. Similarly, Colombia's government fought for 33 years a *guerilla* against the Revolutionary Armed Forces of Colombia (FARC).

percentages of revenue from trade taxes and from indirect taxes. The idea is that governments in countries with little fiscal capacity tend to use border taxes, the easiest to track. On average we observe a percentage of revenue from trade taxes of 42% and that from indirect taxes of about 58%. Since we look for a proxy of fiscal capacity we construct a variable which is 100 minus percentages of revenue from trade taxes (or indirect taxes).

Finally, we employ a large set of controls for estimating meaningful correlations between wars and tax morale. We use the (logarithm of) GDP per capita (PPP in constant 2011 international dollars) and the population to control for the size of the country. Both come from the World Development Indicators database and are country averages between 1980 and 2012. We then use the Alesina et al. (2005) index of ethnic fragmentation to hold size potential conflicts over public goods that might encourage or discourage tax compliance. An index of corruption and one of government effectiveness are used to control for the quality of the government that might affect external motivation in paying taxes or reciprocity. The two indexes are computed as averages from the World Government Indicators database between 1996 (the first year reported) and the 2014. All the specifications control for the share of the main religions in the country in the eighties (Catholic, Protestant, and Muslim) and a set of dummies indicating the legal origin of the country. They all come from La Porta et al. (1999).

Using this information structure, we estimate the following benchmark regression:

$$TaxMorale_{it} = \alpha + \beta\, War_i + \delta\,(War_i \times \tau_i) + X_i\,\gamma + \eta_t + \varepsilon_{it}, \tag{24}$$

where i indicates countries and t WVS waves. War_i is either the total number of conflicts in which country i has been involving or international disputes or civil wars. τ_i is one of the four measures of fiscal capacity discussed above. X_i is a vector of controls, whereas η_t is year fixed effect that we introduce to capture differential trends in tax morale due to time. Since this is not sufficient to absorb the entire intraclass correlation within a country we cluster standard errors ε_{it} at country level.

We estimate (24) using pooling ordinary least squares. Since our interest relies on the effect of wars on tax morale, we compute marginal effects of war on tax morale for different values of fiscal capacity, that is $m(\tau_i) = \beta + \delta \times \tau_i$. According to our theory, we expect $m(\tau_i)$ to be negative for low values of τ_i and positive for high values of it. In words, we expect conflicts to favor a culture of tax compliance when expanding the country's fiscal capacity is relatively more costly. In countries where expanding fiscal capacity is cheaper war is expected to be culture disruptive.

4.2 Results

We present our main results in Tables 2, 3, 4, and 5, each of them using a different measure of fiscal capacity. In Table 2 and 3 we use percentages of income taxes on GDP and percentages of total taxes on GDP, respectively. Tables 4 and 5 report our estimations when we employ percentages of trade taxes on tax revenues and percentages of indirect taxes on tax revenues.

Let us consider first percentages of income taxes on GDP. In the first column of Table 2 we estimate a negative correlation between income taxes and tax morale, conditional on controlling for GDP per capita, population, ethnic fragmentation, the shares of main religions and legal origin dummies that might affect simultaneously the adoption of a given tax schedule and influencing the formation of a tax culture of compliance. Countries with higher levels of income taxes are less willing to comply with tax payment. On the other side, we find that countries that experienced more conflicts have a lower level of tax morale, although the estimation, reported in column 2, is not statistically significant different from zero. In column 3 we combine the two sources of interest as in equation (24). While both fiscal capacity and wars negatively correlate with tax morale, their interaction has a positive sign. We find similar results irrespective to the type of wars combated (international wars in column 5 and civil wars in column 7).

This result brings support in favor of a complementary effect of war and fiscal capacity on tax morale. War produces culture disruptive consequences when countries have a poor fiscal capacity, but when the state is capable of channeling additional tax revenues from an increase in tax morale war may produce beneficial effects. We can appreciate the hand-in-hand movement of tax morale and fiscal capacity when countries have more frequent wars in Figure 4. Figure 4 is organized along three panels. On the left we trace the marginal elasticity of war on tax morale (in the y-axis) for different percentages of income tax on GDP (in the x-axis). In the mid panel we report the same information when we use only a percentage change in international wars, whereas in the right we use only a percentage change in civil wars. The central line represents the point estimation of the marginal elasticity and is surrounded by the two confidence bands at 95%.

When we use the total number of conflicts, we find a statistically significant marginal elasticity of -0.021 for countries with the minimum level of income taxes, namely 0.30. For these countries, a 1% increase in war is associated with a 0.021% decrease in tax morale. The effect is monotone and negative up to an income tax rate of 5.7 in percentage of the GDP. For countries with a level of fiscal capacity higher than 20%, in terms of income tax rate,

the marginal effect turns on the positive sign up to a 0.030% increase in tax morale. When we use alternatively international or civil wars, we find the same monotonicity result and the same discontinuity between countries with low and high fiscal capacity, but when we measure conflicts using civil wars both the negative and the positive effect on tax morale are much larger. Specifically, when income tax rate is below 5.6 a 1% more of civil wars is associated with a reduction of about 0.027% in tax morale. In countries with income tax rate higher than 12% the effect turns on the positive sign up to 0.059% on tax morale. This effect is 4 times larger than with international wars.

In Table 3 we look at the same relation using percentages of total taxes on GDP. This index is broader than that using income taxes and contains several dimensions of fiscal capacity. The table is organized in exactly the same way of Table 2, and therefore columns 2, 4, and 6 coincide with those reported in Table 2. In the first column we report our estimation of the conditional correlation between total taxes in percentage of the GDP and tax morale. As expected, the correlation is negative (-0.019) but smaller than the one estimated through income taxes. Turning on the link between tax morale, fiscal capacity, and wars we find similar results of Table 2; both fiscal capacity and wars are negatively associated with tax morale but their interaction has a positive sign. Once again, we find a stronger effect for civil wars (column 7) than for international disputes (column 5). We present the marginal elasticities in Figure 5. The three panels, total number of wars, international conflicts, and civil wars, report similar patterns and, in all the three cases, in countries with low rates of total taxes tax morale is negatively associated with conflict but positively if a country has large bureaucratic apparatus behind. This is particularly evident for civil wars. Civil wars are substantially culture-disruptive in countries with poor fiscal capacity (-0.048%), but may be an effective tool for mobilizing citizens (the marginal elasticity is +0.063%).

Finally, in Tables 4 and 5, and in Figures 6 and 7, we use 100 minus percentages of revenue from trade taxes and 100 minus percentages of revenue from indirect taxes as two alternative measures of fiscal capacity. Our findings here confirm previous results: in countries with low fiscal capacity, using border taxes (or indirect taxes) as a main fiscal instrument, conflicts are negatively associated with tax morale; in those that use predominantly other more sophisticated fiscal instruments, more wars have a beneficial effect in forming a culture of tax compliance. In terms of magnitude of the marginal elasticities, we find that in the first type of countries a 1% increase in war is associated with about a 0.060% decrease in tax morale when we use the share of trade taxes and -0.032% when the share of indirect taxes are employed. In the second type of countries, with high fiscal capacity, the marginal elasticity is

positive but never larger than 0.017%.

In Appendix A we replicate our empirical analysis using years of wars at the place of number of wars. Although the two measures deliver different information on a country's conflicts, the two are highly correlated (correlation is 0.857). Not surprisingly we hence find substantially same results. As before, we present regression results using income taxes on GDP in Table A1, total taxes in Table A2, percentages of revenue from trade taxes in Table A3, and those from indirect taxes in Table A4. In all these alternative specifications we find the interaction term between war and fiscal capacity to be positive. Likewise, Figures A1, A2, A3, A4 trace marginal elasticities for different values of the cross-country distribution in terms of fiscal capacity. In all these graphs we find similar magnitudes and same pattern across levels of fiscal capacity. Clustered standard errors are slightly bigger because of a more disperse cross-country distribution of years of wars.

5 Conclusions

In this paper, we argue that past exposure to conflicts might induce the government to invest in tax morale formation in addition to expanding fiscal capacity. While the second mechanism has been investigated at large, the first one has remained confined to descriptive evidence. We examine this idea by developing a theoretical model with a clear-cut mechanism: war reduces the marginal relative cost of mobilizing people making investment in tax compliance culture cheaper. The reduction of such a cost also required a consolidated fiscal capacity. From this relation emerges a dynamic complementarity that we derive in a multi-periods set-up.

We argue and show that this mechanism is consistent with cross-country evidence that we have presented in Section 4. Our estimates show that war frequency (either internal or external) explains tax morale variation across country. Our analysis outlines heterogeneous results according with the level of fiscal capacity. Those with a consolidated level of fiscal capacity, that is with high income tax rate on GDP or with high level of total taxes or with a small share of revenue from trade or indirect taxes, have population more compliant with paying taxes if exposed to more conflicts in the past. In terms of magnitude we estimate a marginal elasticity around 0.03% and 0.06% according to different measures of tax morale. Conversely, we find a negative and sizable marginal effect of war exposure to tax morale in countries with poor fiscal capacity, and much larger when the source is a civil war. This result is consistent with the literature on inefficiency persistence.

The punchline of this study is that culture matters in explaining cross-country variation

in tax compliance. For long time its role has been neglected, in favor of more reduced form approach directly going from war to state capacity. In line with recent development of the economic theory, we argue that a culture of compliance is a prerequisite to sustain and hefty tax burden. Future research can further amply our knowledge of tax morale formation exploiting historical junctures in the last century.

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Table 1: Summary Statistics

	mean	sd	min	max	count
tax morale	8.76	0.62	6.88	10.00	199
income τ	14.99	10.86	0.30	34.60	199
total τ	26.62	12.42	2.21	50.81	199
100 - trade τ	58.03	12.24	16.34	67.99	199
100 - indirect τ	41.77	18.98	0.00	68.61	199
# wars	1.28	2.37	0.00	9.00	199
# inter. wars	0.61	1.61	0.00	7.00	199
# civ. wars	0.67	1.45	0.00	9.00	199
wars (years)	4.62	9.21	0.00	41.00	199
inter. wars (years)	1.36	4.23	0.00	22.00	199
civ. wars (years)	3.27	7.85	0.00	41.00	199
Ethnic Fract.	0.32	0.26	0.00	0.93	199
Corruption Index	0.82	1.15	-1.18	2.43	199
Govt. Effectiveness	0.86	0.99	-1.09	2.15	199
GDP per capita (log)	9.77	1.04	6.71	11.30	193
Population (log)	17.03	1.64	12.56	20.93	199
Catholics (share)	35.87	37.66	0.00	96.90	199
Muslims (share)	12.98	28.66	0.00	99.40	199
Protestants (share)	21.99	30.09	0.00	97.80	199
English L.O.	0.30	0.46	0.00	1.00	199
French L.O.	0.42	0.49	0.00	1.00	199
Socialist L.O.	0.03	0.16	0.00	1.00	199
Scandinavian L.O.	0.13	0.34	0.00	1.00	199

Table 2: Number of Wars, Income Taxes, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
income τ	-0.021**		-0.025***		-0.022**		-0.030***
	(0.009)		(0.008)		(0.009)		(0.009)
# *wars*		-0.008	-0.147**				
		(0.049)	(0.064)				
# *wars* $\times$ *income* τ			0.011***				
			(0.003)				
# *inter. wars*				0.035	-0.197**		
				(0.057)	(0.080)		
# *inter. wars* $\times$ *income* τ					0.013***		
					(0.004)		
# *civ. wars*						-0.047	-0.348**
						(0.077)	(0.149)
# *civ. wars* $\times$ *income* τ							0.043**
							(0.019)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.187	0.153	0.238	0.156	0.212	0.160	0.249

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Number of Wars, Total Taxes, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
total τ	-0.019**		-0.025***		-0.021**		-0.029***
	(0.009)		(0.009)		(0.010)		(0.009)
# *wars*		-0.008	-0.231***				
		(0.049)	(0.079)				
# *wars* $\times$ *total* τ			0.011***				
			(0.003)				
# *inter. wars*				0.035	-0.264**		
				(0.057)	(0.118)		
# *inter. wars* $\times$ *total* τ					0.011**		
					(0.005)		
# *civ. wars*						-0.047	-0.620***
						(0.077)	(0.189)
# *civ. wars* $\times$ *total* τ							0.037***
							(0.012)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.189	0.153	0.243	0.156	0.209	0.160	0.264

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Number of Wars, Revenue from Taxes on Trade, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
100 - trade τ	0.004		-0.010		0.001		-0.011
	(0.011)		(0.010)		(0.012)		(0.011)
# wars		-0.008	-0.491***				
		(0.049)	(0.113)				
# wars × 100 - trade τ			0.009***				
			(0.002)				
# inter. wars				0.035	-0.478***		
				(0.057)	(0.168)		
# inter. wars × 100 - trade τ					0.008***		
					(0.002)		
civ. wars (years)							
# civ. wars						-0.047	-0.647***
						(0.077)	(0.171)
# civ. wars × 100 - trade τ							0.012***
							(0.003)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.154	0.153	0.254	0.156	0.188	0.160	0.228

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Number of Wars, Revenue from Indirect Taxes, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
100 - indirect τ	0.001		-0.008		-0.004		-0.007
	(0.005)		(0.005)		(0.006)		(0.005)
# wars		-0.008	-0.214***				
		(0.049)	(0.056)				
# wars × 100 - indirect τ			0.005***				
			(0.001)				
# inter. wars				0.035	-0.253***		
				(0.057)	(0.083)		
# inter. wars × 100 - indirect τ					0.005***		
					(0.001)		
# civ. wars						-0.047	-0.318***
						(0.077)	(0.085)
# civ. wars × 100 - indirect τ							0.007***
							(0.002)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.153	0.153	0.257	0.156	0.199	0.160	0.230

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 4: Number of Wars, Income Taxes, and Tax Morale. Marginal Elasticity

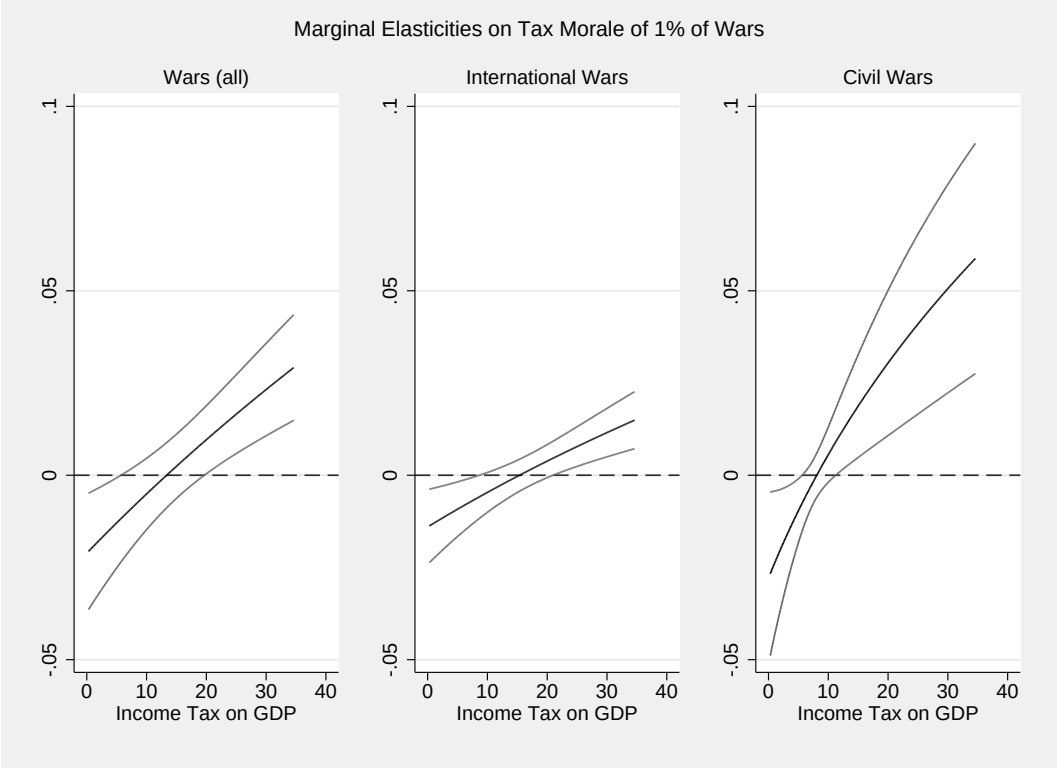

Figure 5: Number of Wars, Total Taxes, and Tax Morale. Marginal Elasticity

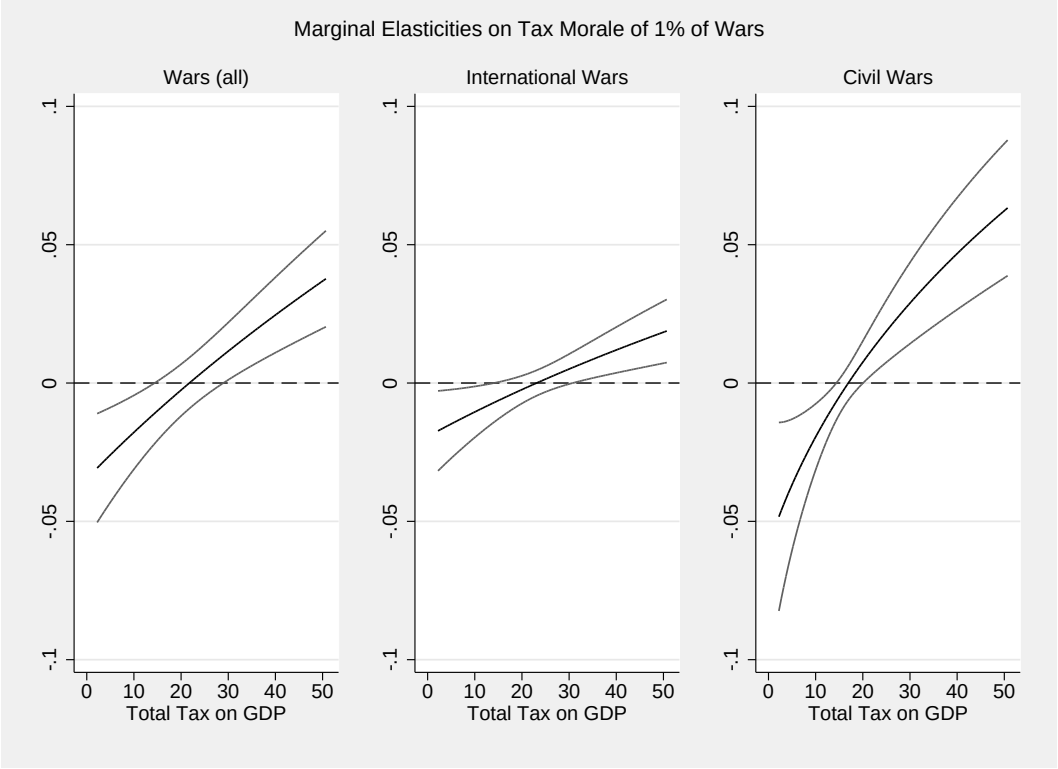

Figure 6: Number of Wars, Revenue from Trade Taxes, and Tax Morale. Marginal Elasticity

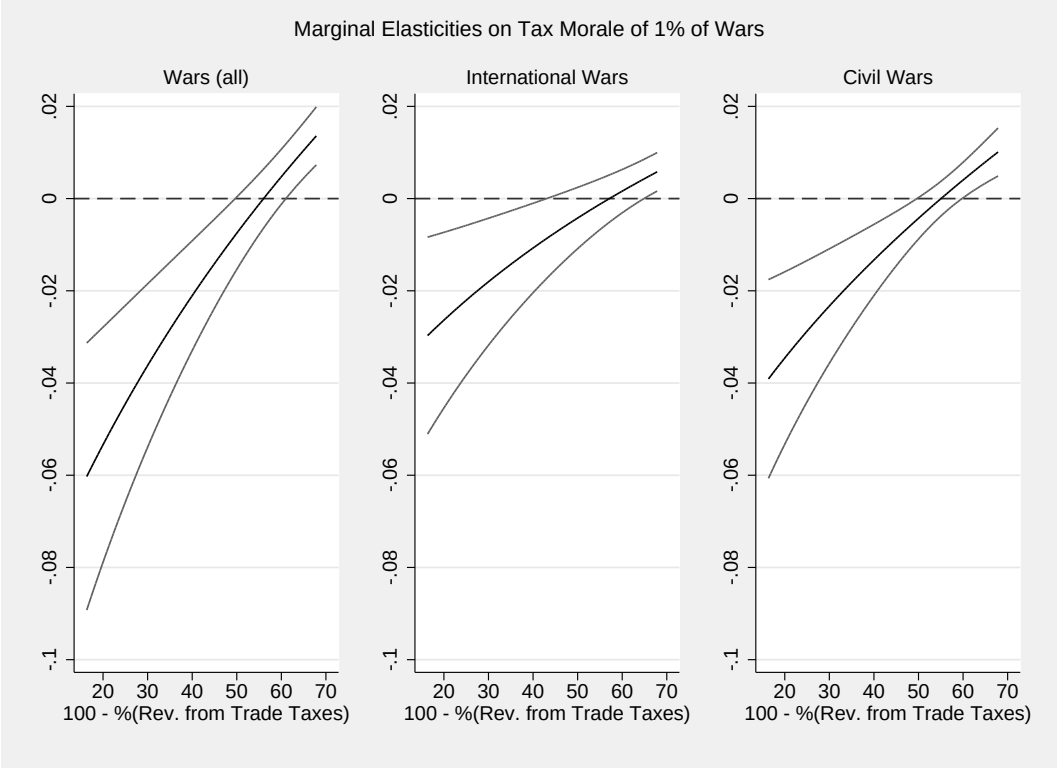

Figure 7: Number of Wars, Revenue from Indirect Taxes, and Tax Morale. Marginal Elasticity

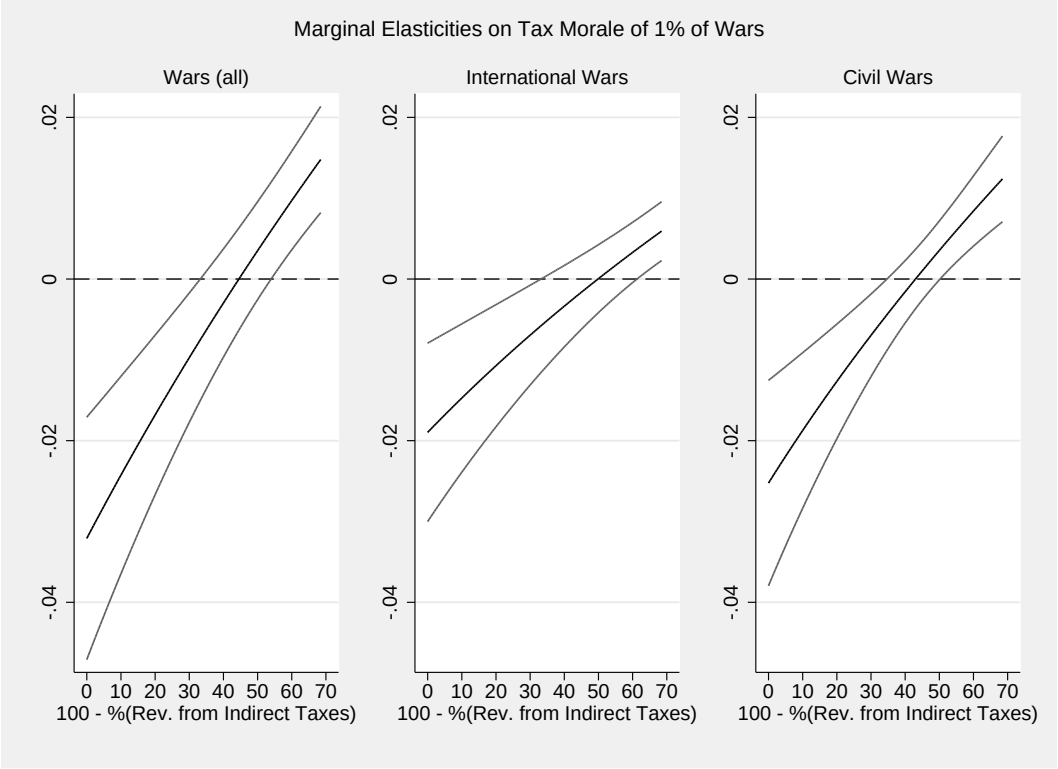

Table A1: Years of Wars, Income Taxes, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
income τ	-0.021**		-0.024***		-0.020**		-0.030***
	(0.009)		(0.008)		(0.009)		(0.008)
wars (years)		-0.002	-0.027*				
		(0.011)	(0.015)				
wars (years) $\times$ *income* τ			0.003***				
			(0.001)				
inter. wars (years)				0.024*	-0.066		
				(0.012)	(0.053)		
inter. wars (years) $\times$ *income* τ					0.005*		
					(0.003)		
civ. wars (years)						-0.009	-0.052*
						(0.013)	(0.028)
civ. wars (years) $\times$ *income* τ							0.007*
							(0.004)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.187	0.153	0.227	0.169	0.205	0.161	0.225

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Years of Wars, Total Taxes, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
total τ	-0.019**		-0.024***		-0.019*		-0.028***
	(0.009)		(0.008)		(0.010)		(0.009)
wars (years)		-0.002	-0.045**				
		(0.011)	(0.022)				
wars (years) $\times$ *total* τ			0.002**				
			(0.001)				
inter. wars (years)				0.024*	-0.099		
				(0.012)	(0.071)		
inter. wars (years) $\times$ *total* τ					0.005*		
					(0.003)		
civ. wars (years)						-0.009	-0.067
						(0.013)	(0.050)
civ. wars (years) $\times$ *total* τ							0.004
							(0.003)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.189	0.153	0.228	0.169	0.206	0.161	0.220

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Years of Wars, Revenue from Taxes on Trade, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
100 - trade τ	0.004		-0.007		0.003		-0.012
	(0.011)		(0.010)		(0.011)		(0.011)
wars (years)		-0.002	-0.115***				
		(0.011)	(0.020)				
wars (years) × 100 - trade τ			0.002***				
			(0.000)				
inter. wars (years)				0.024*	-0.202*		
				(0.012)	(0.104)		
inter. wars (years) × 100 - trade τ					0.003**		
					(0.002)		
civ. wars (years)						-0.009	-0.147***
						(0.013)	(0.029)
civ. wars (years) × 100 - trade τ							0.003***
							(0.001)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.154	0.153	0.263	0.169	0.188	0.161	0.242

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Years of Wars, Revenue from Indirect Taxes, and Tax Morale.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
100 - indirect τ	0.001		-0.007		-0.003		-0.008
	(0.005)		(0.005)		(0.005)		(0.005)
wars (years)		-0.002	-0.044***				
		(0.011)	(0.011)				
wars (years) × 100 - indirect τ			0.001***				
			(0.000)				
inter. wars (years)				0.024*	-0.146***		
				(0.012)	(0.054)		
inter. wars (years) × 100 - indirect τ					0.003***		
					(0.001)		
civ. wars (years)						-0.009	-0.056***
						(0.013)	(0.012)
civ. wars (years) × 100 - indirect τ							0.002***
							(0.000)
Observations	193	193	193	193	193	193	193
N_clust	61	61	61	61	61	61	61
Adjusted R^2	0.153	0.153	0.256	0.169	0.200	0.161	0.231

Notes: Dependent variable is tax morale. All specifications include the logarithm of the gdp per capita, the logarithm of the population, and the ethnic fragmentation index. Also they control for the shares of the main religions and legal origin dummies. A year fixed effect is included. Standard errors are clustered at country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure A1: Years of Wars, Income Taxes, and Tax Morale. Marginal Elasticity

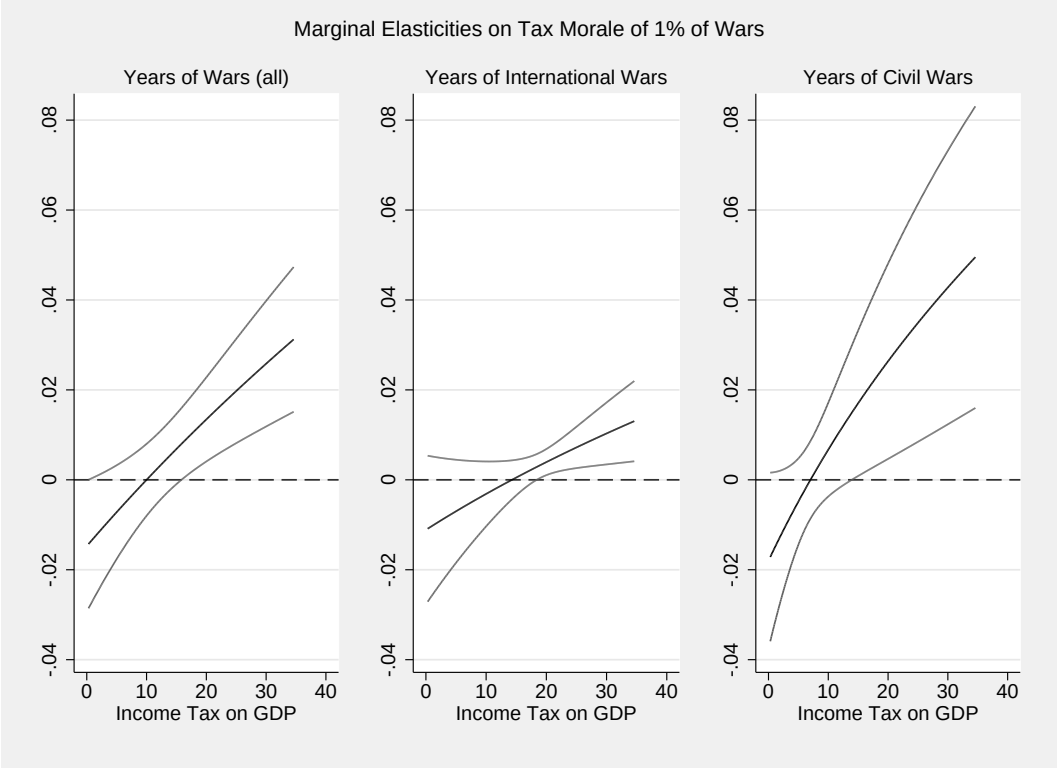

Figure A2: Years of Wars, Total Taxes, and Tax Morale. Marginal Elasticity

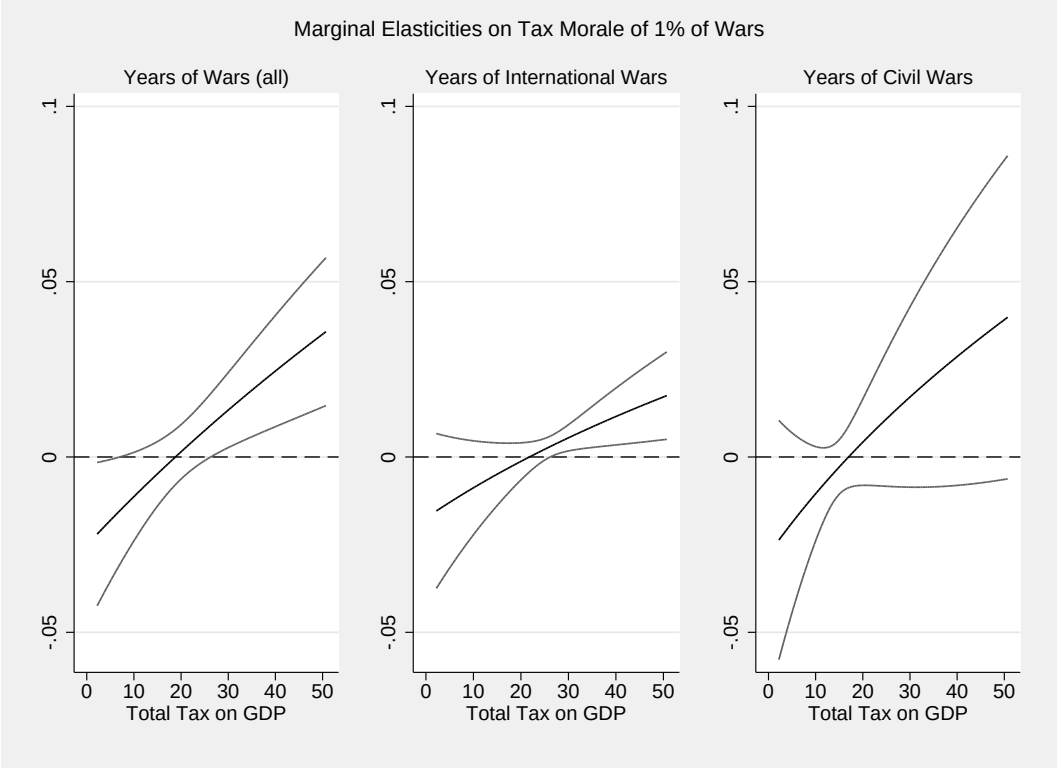

Figure A3: Years of Wars, Revenues from Trade Taxes, and Tax Morale. Marginal Elasticity

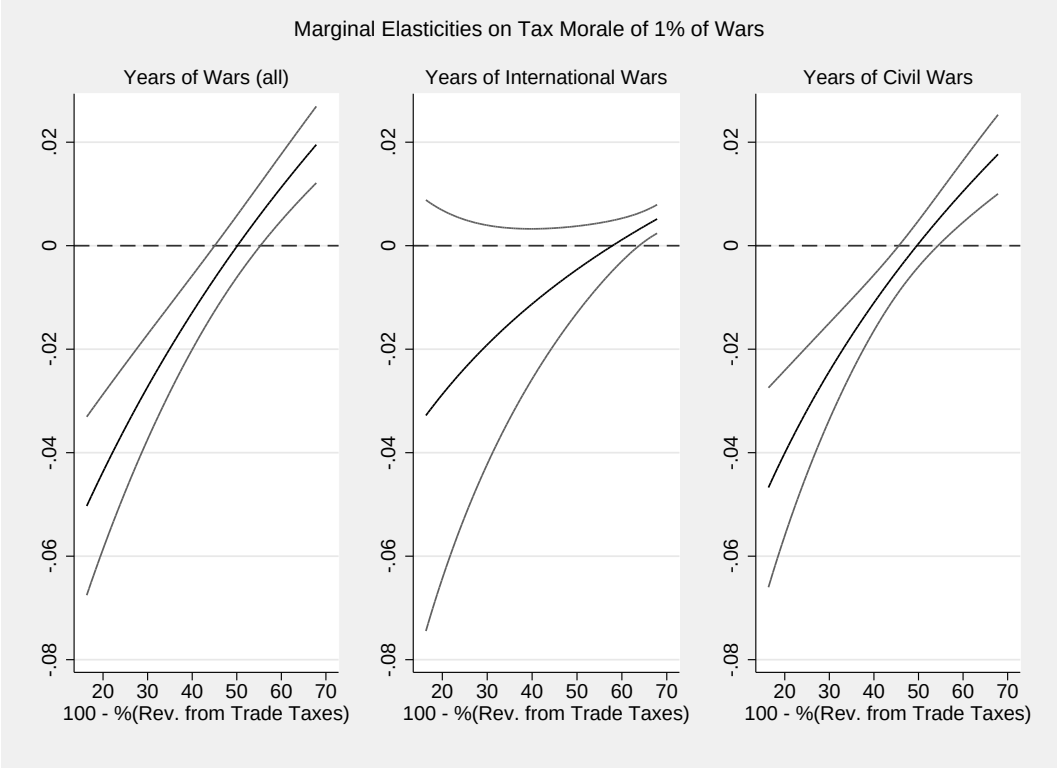

Figure A4: Years of Wars, Revenues from Indirect Taxes, and Tax Morale. Marginal Elasticity