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Tax morale, fiscal capacity, and war

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ABSTRACT

This paper studies the effects of mobilization for war on the development of fiscal capacity and the values of tax compliance (*tax morale*). We propose a dynamic setting where governments may invest resources to improve the efficiency of the fiscal apparatus and the citizens' tax morality in order to raise the necessary revenues for the defense against a threat (external or internal), and parents optimally choose to transmit their preferences of tax compliance to children. Despite fiscal capacity and tax morale are initially substitutes, we show how a dynamic complementarity may arise in equilibrium from a more efficient transmission of the values of tax compliance in countries with high fiscal capacity, and this may explain why they tend to move together over time. Under reasonable conditions, we obtain that the effect of a higher threat of war on the steady-state level of the culture of tax compliance is negative when fiscal capacity is relatively low, and positive when the latter is large. We show cross-country evidence based on war frequency, fiscal capacity, and tax morale that is consistent with the results of our theory.

KEYWORDS
civil wars, culture and institutions, external threat, fiscal capacity, state capacity, tax morale

1 | INTRODUCTION

In recent years several works have analyzed the effects of wars on state 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 & 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 defense, as well as other common interest public goods, becomes more valuable in presence of an external threat, which makes it optimal setting up an infrastructure for raising the resources to finance it. Some contributions have highlighted that the effect of military rivalry on state capacity may not always be positive however, and that other conditions need to be verified; Gennaioli & Voth (2015), for example, show that this is the case only when money is important for military success.

Another strand of the literature has pointed out that while an efficient fiscal apparatus is essential for inducing citizens to comply with taxes, high rates of compliance cannot be fully explained by the level of enforcement, and that citizens' culture of tax compliance (or *tax morale*), namely their intrinsic motivation to pay taxes, also plays a key role (Andreoni et al., 1998; Torgler, 2007; Luttmer & Singhal, 2014).[1] In other words, there is now a vast consensus that the existence of a culture of compliance among citizens is crucial for raising revenues in any country. And while there is less consensus on the determinants of tax morale, the literature has identified culture and beliefs, the perception of individuals about the government, the fairness of the tax schedule, and the presence of ethnic differences as important factors affecting the intrinsic motivation of citizens to pay taxes (e.g., Torgler, 2005; Hofmann et al., 2008; Lago-Peñas & Lago-Peñas, 2010).[2] Some other recent works have also argued that citizens' mobilization for a common cause and patriotism can be important determinants of voluntary tax compliance (Feldman & Slemrod, 2009; Konrad & Qari, 2012).

In this paper, we study how war affects the evolution of the tax morale and fiscal capacity in a dynamic setting where governments may invest resources to improve the efficiency of the fiscal apparatus and citizens' tax morality to finance defense against a threat (external or internal) and parents optimally choose to transmit their preferences of tax compliance to children. Agents live for two periods and at the end of the second period of life decide the transmission of their preferences to children. They produce and pay taxes to finance the provision of public goods, including

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[1] For example, Luttmer & Singhal (2014, p. 150) define tax morale as "an umbrella term capturing non-pecuniary motivations for tax compliance as well as factors that fall outside the standard, expected utility framework" .

[2] For the importance of trustworthiness in others and of cooperation see, for example, Alm & Torgler (2006), Frey & Torgler (2007), and Weigel (2020). Recent evidence on state legitimacy as an important determinant of compliance is provided by Weigel (2018) (see also the references cited therein). Filippin et al. (2013) study the role of enforcement on tax morale, while Doerrenberg & Piechl (2013) analyze the relationship between tax morale and progressive taxation. A strand of the literature has instead focused on the importance of institutions and shown that, for example, fiscal decentralization (Güth et al., 2005; Torgler et al., 2010) and its interaction with ethnic fragmentation (Belmonte et al., 2018) may have an impact on the citizens' culture of tax compliance. Other works have established a causal link between tax morale and the shadow economy (Halla, 2012).

the defense of the country; tax evasion is 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. Therefore, higher citizens' tax compliance and a consolidated fiscal capacity help the government in rising revenues to face the threat. If fiscal capacity and tax morale are insufficient to guarantee the level of revenues needed to wage war, the government may invest resources to improve the state's fiscal capacity and/or the citizens' culture of tax compliance. We then analyze the choice of parents in transmitting their tax morality to children and characterize the equilibrium of the model describing the dynamics of tax morale and fiscal capacity over time.

The model leads to the following results. First, a higher degree of conflict induces governments to invest resources to increase both fiscal capacity and the citizens' culture of tax compliance, but higher levels of fiscal capacity correspond to a lower investment in tax morale; in other words, the two instruments of state capacity are substitutes. Second, the salience of the conflict for the citizens may affect the decision of the government about which investment should be favored; conflicts that reduce significantly the marginal cost of increasing the citizens' culture of tax compliance induce governments to favor the investment in tax morale relative to that in fiscal capacity. Third, if it is less costly for parents transmitting a culture of tax compliance to children in the presence of efficient fiscal institutions (i.e., congruence effects),[3] fiscal capacity and tax morale tend to move together over time, namely they are complements. Fourth, while the effect of a higher threat of war on the steady-state level of the culture of tax compliance is generally ambiguous, we obtain that this effect is negative when fiscal capacity is relatively low and positive when the latter is big enough if the congruence effect is large at relatively high levels of fiscal capacity.

Our results are consistent with a debate led at the juncture of the 19th and 20th century on the causes of the victory of Unionists over Confederates in the American Civil War (Hill, 1894; Dingley, 1899; Lerner, 1955). Common to that debate was the acknowledgment of the key role played by 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,[4] they also established a sophisticated propaganda campaign to market almost $3 billion of bonds that saw a decisive participation of the citizenry. The South lacked instead 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 only earned a total of $115 million (Burdekin & Langdana, 1993). The success of the Northern bond market was unprecedented and for several scholars it represented one of the roots of the subsequent famous wartime sacrifice that has largely characterized the history of the United States in the 20th century (Bank et al., 2008).

Another example of the importance of the mobilization for war in fostering the individuals' willingness to comply with taxes is discussed by Jones (1988, 1996). In particular, Jones documents the use of mass media during World War II by the US Treasury, that involved even Walt Disney, to foster the patriotic sentiments of the citizens in order to improve their willingness to pay taxes. The author also presents evidence suggesting that such a strategy was successful in achieving the aims of the US Treasury.

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[3] The so-called *congruence doctrine* refers to the idea about the existence of long-run congruence between formal political institutions and political culture. For more on this point see, for example, Almond & Verba (1963), Eckstein (1988), Hibbing & Theiss-Morse (1995), and Mishler & Rose (2001).

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

In addition to this anecdotal evidence, we here present empirical evidence linking war occurrence, fiscal capacity, and tax morale. In particular, we collect data on historical levels of fiscal capacity and war frequencies for 61 countries from 1939 to 2010 and match them with survey data on tax morale obtained from the World Values Survey (WVS) and the European Values Study (EVS). Our estimates show a positive correlation between war and tax morale in countries with a relatively high fiscal capacity while the relationship is reversed in countries with limited fiscal capacity. Interestingly, these results hold both for external and internal wars and are robust to different measures of fiscal capacity and proxies of the intensity of conflict. We also provide an instrumental variable analysis that uses the historical exposure to civil wars in culturally and geographically proximate countries to select exogenous variation in domestic civil wars exposure. We first compute a measure of religious distance as the sum of the quadratic distances between the shares of adherence to a given religion in the country and in its neighbor. Next, we select geographically proximate countries with a sufficiently low religious distance to instrument a country's record of civil wars. This IV analysis suggests that the OLS estimates are slightly biased towards zero. It therefore helps us interpret causally the effects of conflict exposure on tax morale for various levels of fiscal capacity, although we also highlight that more research is needed to explore the causal impact of war on the culture of tax compliance.

This paper is related to a number of distinct literatures but it mostly relates to the literatures on state capacity (Besley & Persson, 2008; Acemoglu et al., 2011; Dincecco & Prado, 2012; Gennaioli & Voth, 2015) and on tax morale formation (Güth et al., 2005; Torgler, 2005; Torgler et al., 2010; Doerrenberg & Piechl, 2013) discussed above. We contribute to the state capacity literature in at least four respects. First, we decompose the concept of state capacity by highlighting the role of institutions (i.e., the efficiency of the state administration or fiscal capacity) and the role of culture (i.e., the citizens' values of tax compliance or tax morale) and address their dynamics and interactions following the existence of a conflict. Second, we highlight the channels through which conflict can generate the coevolution of fiscal capacity and tax morale. Third, we find that the threat of war increases state capacity but the channels through which this takes place depend on the existing level of fiscal capacity: the effect of war on the development of a culture of tax compliance is positive when fiscal institutions are efficient (high fiscal capacity), and negative otherwise. Fourth, unlike some earlier findings (e.g., Besley & Persson, 2008), we obtain that civil wars might not necessarily have negative effects on state capacity. Indeed, our analysis shows that also internal wars may foster tax morale provided that the existing fiscal capacity of the state is sufficiently large.[5]

Our paper is complementary and close in spirit to Feldman & Slemrod (2009) who study the effect of interstate conflicts on the citizens' willingness to comply with taxes, finding a positive relationship. Our analysis differs from theirs along various dimensions: first, we allow conflicts to have heterogeneous effects on the culture of tax compliance depending on the level of fiscal capacity; second, we study also the effects of internal conflicts on tax morale and fiscal capacity; third, we provide a theoretical framework to investigate the role of conflicts and mass mobilization on tax morale and fiscal capacity through their effects on socialization and transmission of values across generations. Similarly, the paper is related to Konrad & Qari (2012) who analyze empirically

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[5] This latter result is consistent with the work of Acemoglu et al. (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. Indeed, we might expect that only in such circumstances the persistence of internal conflicts is likely to be detrimental for a culture of tax compliance, while civil wars could foster tax morale if the government invests enough resources in repression and in citizens' mobilization.

the relationship between individuals' patriotism and attitudes toward tax compliance but do not consider the role of conflicts, and to Besley (2020) who proposes a model to explore the role of civic culture in expanding fiscal capacity. More generally, building on the literature on cultural transmission initiated by Bisin & Verdier (2000), our paper contributes to the growing literature that studies the coevolution of culture and institutions (Roland, 2004; Tabellini, 2010; Ticchi et al., 2013; Gorodnichenko & Roland, 2021) as well as the importance of their dynamics for economic growth (Mokyr, 2012, 2016; Bénabou et al., 2021).

Our work also relates to the literature that addresses the effects of war on political institutions, citizens' culture and public goods provision. Ticchi & Vindigni (2008) analyze how war can affect democratization and the provision of welfare state and, in the same vein, Alesina et al. (2020) study the ways through which external threat might lead governments to provide public goods and adopt policies that homogenize the culture of the population (i.e., nation-building). Along similar lines, Aghion et al. (2019) and Alesina et al. (2021) explore the link between war and education and the role played by political institutions, while Caprettini & Voth (2018) study how the public good provision can boost patriotism in war.

The paper is organized as follows. Section 2 describes the framework, provides the solution for the government problem for each generation and extends the analysis to a dynamic setting. Section 3 presents our empirical findings. Section 4 concludes. Additional material is provided in the Online Appendix.

2 | THE MODEL

2.1 | The framework

We consider an economy populated by a countable infinity of non-overlapping generations of agents living for two periods, $s \in \{1, 2\}$. Each generation t is composed by a continuum of agents of measure one.

There are N groups in the population and each member of group $j \in \{1, \dots, N\}$ 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 $\tau > \hat{\tau}$. Therefore, government revenues are equal to $T = \sum_{j=1}^{N} \zeta^j \tau n^j Y^j$, where $\zeta^j \in \{0, 1\}$ is an indicator function denoting whether individuals of group j pay taxes ($\zeta^j = 1$) or not ($\zeta^j = 0$).[6] The government uses the revenues T for the provision of a public good, Q, that benefits equally all the citizens, such as a national health system, and for financing the military expenditure, G, to deal with internal or external threat. The military technology is such that one unit of government revenues can be transformed into one unit of military expenditure G, and the public good Q cannot be provided when there is a conflict ($\mu = 1$). 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 in the first period of life ($s = 1$) and the conflict takes place in the second period ($s = 2$) only. $\mu \in \{0, 1\}$ is an indicator function denoting the existence ($\mu = 1$) or not ($\mu = 0$) of such threat. Fighting an internal or external threat is a public good

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[6] Specifically, in each period s, individual i of groups j decides whether to pay taxes or not, $\zeta_{i,s}^j \in \{0, 1\}$. As we shall assume no heterogeneity within groups, all agents in a given group j will make the same decisions and, therefore, we will employ the indicator function $\zeta_s^j \in \{0, 1\}$.

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which provides a utility to each citizen equal to $\rho^j \gamma G^\beta$, where $\gamma \geq 0$ captures the level of the threat, and $\rho^j > 0$ represents the weight attached by each agent of group j to defense. We assume that $\beta < 1$ so that military expenditure G delivers a decreasing marginal return. Likewise, $\theta < 1$ is the elasticity from the public good Q. Moreover, we assume that in the first period of each generation there is no provision of public goods and government revenues are used to increase fiscal capacity and/or the citizens' culture of tax compliance, while in the second period there is the provision of a public good Q that benefits equally all the citizens or the provision of national defense G.

As individuals derive utility from a two-period flow of post-tax income and from the provision of the public good G in wartime ($\mu = 1$) and from Q in peacetime ($\mu = 0$) the two-period quasi-linear utility function for each individual i of group j (when they do not evade taxes) is equal to

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

- **Tax evasion**. When individuals evade taxes ($\zeta^j = 0$) they bear a utility cost $M^j \geq 0$ which depends positively on their level of tax morale (more on this point below). Tax evaders get caught with probability p and, in this case, they pay a sanction S^j; therefore, the expected sanction is $E^j = pS^j$; 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 $E_1^j = p_1 S_1^j$ and $M_1^j \geq 0$, respectively. However, the government can invest resources to increase fiscal capacity and tax morale in the subsequent period.

The *paying taxes constraint* for each group j in the two periods define whether the agents of that group find it optimal paying tax or avoiding it. The constraints can be obtained by considering that the utility from paying taxes is $(1 - \tau_s)Y^j$, while the expected utility of evading it is $Y^j - M_s^j - E_s^j$. Therefore, each agent in group j finds it optimal to pay taxes when

$$\tau_s Y^j \leq M_s^j + E_s^j, \tag{2}$$

where $s \in \{1, 2\}$.

To simplify the analysis, we assume that monetary sanctions E^j and utility losses M^j from evasion are both linear in income Y^j. This assumption implies that the paying taxes constraint either holds for all groups or for none. Indeed, allowing some groups to avoid taxes would be equivalent to assuming the possibility of selective income redistribution among groups, which is a feature that complicates the analysis without providing interesting insights to our theory. The linearity assumption of E^j and M^j in Y^j implies that the paying taxes constraint (2) is unique for all groups $j \in \{1, \dots, N\}$ and can be rewritten as

$$\tau_s Y \leq M_s + E_s, \tag{3}$$

where M_s and E_s represent the level of tax morale and fiscal capacity. Condition (3) that defines whether any citizen in period $s \in \{1, 2\}$ evades taxes clarifies that the capacity of the state to raise revenues ($\tau_s Y$) is the result of the structure and efficiency of the bureaucratic apparatus of the state (the fiscal capacity E_s) *and* by the citizens' culture of tax compliance (the tax morale M_s).

- **Investments in state capacity**. In the first period ($s = 1$), the government can invest resources to increase fiscal capacity and the culture of tax compliance. The cost of increasing the level of fiscal capacity is $H(\Delta E)$, where $\Delta E = E_2 - E_1$, $H'(\cdot) > 0$, $H''(\cdot) > 0$, and $H(0) = 0$. The cost of increasing tax morale is $C(\Delta M; \mu)$, where $\Delta M = M_2 - M_1$, and with $C(\cdot)$ increas-

ing and convex in ΔM. We also assume that the cost of increasing the culture of tax compliance is lower when there is an internal or external threat ($\mu = 1$), that is, $C(\Delta M; 1) < C(\Delta M; 0)$ and $C'(\Delta M; 1) < C'(\Delta M; 0)$. The idea behind this assumption is that mobilization of citizens to fight an enemy helps creating a sense of national identity that allows the government to increase tax morale at a lower cost than in peacetime.

We assume that there is no cost of maintaining the level of fiscal capacity (i.e., it does not depreciate—Besley & Persson, 2008), and this allows us to focus only on the cost of increasing it. Similarly, we assume that the sanctions levied are dissipated and do not accounted for in the government budget. We also ignore the fact that mobilization against the threat could generate an exogenous increase in tax morale among citizens at zero costs. Considering all these features would complicate our analysis without affecting our results.

- **Timing of events for generation t.**
First period:

1. individuals receive their income;
2. the existence of a threat $\mu \in \{0, 1\}$ in 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, that is $\{\tau_1, \Delta E, \Delta M\}$;
4. individuals decide whether to evade or pay taxes, $\zeta_1^j \in \{0, 1\}$;
5. the bureaucratic apparatus of the state checks whether citizens have paid taxes or not, imposes the sanctions, and implement the fiscal policy.

Second period:

1. individuals receive their income;
2. the government decides its fiscal policy $\{\tau_2, G, Q\}$ depending on the existence of a threat ($\mu = 1$) or not ($\mu = 0$);
3. points 4 and 5 of period 1 apply;
4. the transmission of tax morale from parents to children takes place.

- **Transmission of values across generations and the dynamics of the culture of tax compliance**. We assume that the level of tax morale of generation t, M_t, depreciates at rate $\alpha(\gamma)$ that is increasing in the level of the threat γ, that is $\alpha'(\gamma) \geq 0$; this feature is in accordance with the evidence (and intends to capture) that conflicts disrupt the culture of cooperation and trust (e.g., Rohner et al., 2013). The remaining fraction $(1 - \alpha(\gamma))M_t$ of the stock of tax morale is inherited by children without parents exerting any effort. However, parents may invest resources to increase the level of tax morale of their children. Specifically, we assume that an effort δ_t of the parent generates an increase in tax morale of the child equal to $\eta_t M_t$, where $\eta_t = f(\delta_t)$ is the share of units actively transmitted by parents to children. Therefore, the level of tax morale of generation $t + 1$ will be given by the following dynamic equation:

$$M_{t+1} = (1 - \alpha(\gamma))M_t + \eta_t M_t. \tag{4}$$

To simplify the analysis and without loss of generality, we assume that $f(\cdot)$ is linear and increasing in δ and, therefore, use the functional form $\eta_t = \delta_t$.[7]

Exerting a level of effort δ in the transmission of tax morale implies a cost $k(\delta, E)$ increasing and convex in δ, that is $k_\delta \equiv \partial k / \partial \delta > 0$ and $k_{\delta\delta} \equiv \partial^2 k / \partial \delta^2 > 0$. We also want to capture the idea that it is less costly for parents transmitting a culture of tax compliance in presence of institutions that are congruent with such values (namely the fiscal apparatus is more efficient).[8] This feature of parents' preferences can be modeled by assuming that the marginal cost of effort k_δ is decreasing in the level of fiscal capacity E (i.e., $k_{\delta E} \equiv \partial k_\delta / \partial E < 0$), and that $k_{\delta E}$ is relatively small (in absolute value) when E is small and it is big if fiscal capacity is large (that is, when E takes high values). Transmitting values of tax compliance also generates utility gains to parents equal to $\eta V(\gamma, M)$ with $V_\gamma > 0$ and $V_M < 0$—that is, each unit transmitted has a value $V(\cdot)$ for the parent that is increasing in the level of threat γ and decreasing in the level of tax morale M.[9] Therefore, the parents net utility from the transmission of their values of tax compliance to children reads

$$U_t = \eta_t V(\gamma, M_t) - k(\delta_t, E_t). \tag{5}$$

2.2 | The equilibrium fiscal policies for each generation

We recall that the individuals' culture of tax compliance M and the level of fiscal capacity of the state E are inherited from the previous generation and given in the first period of life.[10]

As group j is in power and decides the government policy in both periods, and agents do not discount utility, the government maximization problem in the first period of life is the following:

$$\max_{\{\tau_1, \tau_2, G, Q\}} V^j = (1 - \tau_1)Y^j + (1 - \tau_2)Y^j + \mu\gamma\rho^j G^\beta + (1 - \mu)Q^\theta, \tag{6}$$

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

$$\tau_1 Y = C(\Delta M; \mu) + H(\Delta E), \tag{7}$$

$$\tau_2 Y = \mu G + (1 - \mu)Q, \tag{8}$$

and the paying taxes constraints defined by (3) for $s \in \{1, 2\}$.

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[7] In other words, to avoid using too many parameters, we are assuming that the level of effort δ is equal to the share η of the values actively transmitted by parents to children. It is immediate that results would not change as long as the two are positively related.

[8] For more details about the congruence between institutions and culture see the works cited in footnote as well as the discussion and results in Ticchi et al. (2013).

[9] The fact that the utility derived by parents from transmitting tax morale to their offspring $V(\gamma, M)$ is higher when parents have been exposed during their life to a war captures the idea that war changes persistently parents' preferences for redistribution and helps overcoming collective actions problems making the transmission of tax morale more salient.

[10] In other words, for any generation t, $E_{1,t} = E_{2,t-1}$ and the level of tax morale $M_{1,t}$ is determined according to the dynamic Equation (4). To simplify the notation, as all variables refer to generation t, we shall omit the indicator of the generation when this does not generate any confusion.

2.2.1 | Wartime ($\mu = 1$)

Let us first consider the case where there is a threat ($\mu = 1$) and the public good defense G has to be provided in the second period. The maximization problem (6) becomes

$$\max_{\{\tau_1, \tau_2, G\}} V^j(\mu = 1) = (1 - \tau_1)Y^j + (1 - \tau_2)Y^j + \gamma \rho^j G^\beta, \tag{9}$$

subject to (7), (8) and (3) for $s \in \{1, 2\}$.

The following assumption contains two conditions that allow us to simplify the analysis and focus on interesting results (more details are reported in the Appendix).

Assumption 1. The parameters are such that:
   (i) $C(\Delta M^*; 1) + H(\Delta E^*) = \tau_1 Y \leq E_1 + M_1$.
   (ii) $\tau_2^{j,NI} Y > E_1 + M_1$, where $\tau_2^{j,NI}$ is the optimal tax rate in period 2 with $\Delta E = \Delta M = 0$.

The meaning of the conditions reported in Assumption 1 is the following. Condition (i) requires that the parameters are such that the paying taxes constraint (3) at period 1 is never binding. This means that that the level of state capacity in period 1 is enough to raise the resources to finance the optimal investments in fiscal capacity and tax morale. Condition (ii) ensures that the problem we are analyzing is interesting as it implies that the optimal level of provision of defense G^* requires a positive investment in state building in the first period. It is also worth noting that, as investing in fiscal capacity and tax morale is costly, the paying taxes constraint (3) for period 2 will always hold with equality sign in equilibrium, which implies that $\tau_2 Y = E_2 + M_2$.[11]

Now, substituting the constraints (7) and (8), and the paying taxes constraint (3) for period 2 into (9), allows us to rewrite the maximization problem of group j under threat as follows:

$$\max_{\{\tau_2, M_2\}} V^j(\mu = 1) = Y^j - \frac{Y^j}{Y}[C(M_2 - M_1; 1) + H(\tau_2 Y - M_2 - E_1)] + (1 - \tau_2)Y^j + \rho^j \gamma \tau_2^\beta Y^\beta, \tag{10}$$

where we have used the fact that $E_2 = \tau_2 Y - M_2$ and therefore $\Delta E = \tau_2 Y - M_2 - E_1$.

The first-order conditions of problem (10) with respect to τ_2 and M_2 are respectively:[12]

$$V_\tau^j \equiv -Y^j H'(\tau_2 Y - M_2 - E_1) - Y^j + \rho^j \gamma \beta \tau_2^{\beta-1} Y^\beta = 0, \tag{11}$$

$$V_M^j \equiv -\frac{Y^j}{Y}[C'(M_2 - M_1; 1) - H'(\tau_2 Y - M_2 - E_1)] = 0. \tag{12}$$

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:

$$[1 + H'(\tau_2^* Y - M_2^* - E_1)]Y^j = \rho^j \gamma \beta (\tau_2^*)^{\beta-1} Y^\beta, \tag{13}$$

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[11] Also note that if τ_1^* and/or τ_2^* are higher than $\hat{\tau}$, then the solution to problem (10) involves corner solutions. Again, we do not discuss this case here because it would only complicate the comparative statics analysis without providing further insights.

[12] The second-order conditions for the maximization problem (10) always hold and are reported in the Appendix.
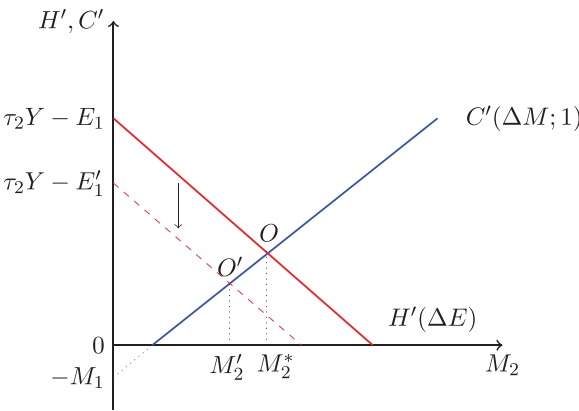
FIGURE 1 The equilibrium level of tax morale in wartime [Colour figure can be viewed at wileyonlinelibrary.com]

$$C'\left(M_2^* - M_1; 1\right) = H'\left(\tau_2^* Y - M_2^* - E_1\right). \tag{14}$$

Equation (13) tells us that in equilibrium the marginal benefit of defense G (the RHS) must equalize its marginal cost (the LHS) given by income taxation in period 2 and the increased income taxes in period 1 necessary to finance the expansion of state capacity. Equation (14) additionally states that in equilibrium the expansion of the two instruments required to raise the necessary government revenues, namely fiscal capacity and tax morale, must be equally costly at the margin (we recall that $\Delta E^* = \tau_2^* Y - M_2^* - E_1$ and $\Delta M^* = M_2^* - M_1$).

Residually, from $(\tau_2^*; M_2^*)$ we obtain that the optimal levels of fiscal capacity and defense are respectively

$$E_2^* = \tau_2^* Y - M_2^*, \tag{15}$$

and

$$G^* = \tau_2^* Y. \tag{16}$$

The tax rate required to finance the investments in fiscal capacity and in tax morale in period 1 follows from the government budget constraint (7) and it is equal to

$$\tau_1^* = \frac{C\left(M_2^* - M_1; 1\right) + H\left(E_2^* - E_1\right)}{Y}. \tag{17}$$

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 a given level of tax revenues at the lowest cost. 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'.

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

The following proposition summarizes the above results.

Proposition 1. *If the country faces a threat ($\mu = 1$), then the government's optimal policy is the set ($\tau_2^*; M_2^*; E_2^*; G^*; \tau_1^*$) determined respectively by (13), (14), (15), (16), and (17). Higher weights ρ^j attached by the government to defeat the enemy and higher levels of the threat γ imply a higher provision of defense G^*, higher taxation τ_1^* and τ_2^*, and more investments in fiscal capacity ΔE^* and in the culture of tax compliance ΔM^*.*

2.2.2 | Peacetime ($\mu = 0$)

We now compare the government's optimal policy set obtained in wartime with that one in absence of any threat so to compare tax morale formation and fiscal capacity expansion in wartime and in peacetime.

Substituting the government budget constraints for the two periods and the paying taxes constraint for period 2 into (6), and recalling that in peacetime $\mu = 0$, the maximization problem can be written as

$$\max_{\{\tau_2, M_2\}} V^j(\mu = 0) = Y^j - \frac{Y^j}{Y}[C(M_2 - M_1; 0) + H(\tau_2 Y - M_2 - E_1)] + (1 - \tau_2)Y^j + \tau_2^\theta Y^\theta. \quad (18)$$

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

$$V_\tau^j \equiv -Y^j H'(\tau_2 Y - M_2 - E_1) - Y^j + \theta \tau_2^{\theta-1} Y^\theta = 0, \quad (19)$$

$$V_M^j \equiv -\frac{Y^j}{Y}[C'(M_2 - M_1; 0) - H'(\tau_2 Y - M_2 - E_1)] = 0. \quad (20)$$

We can therefore obtain the optimal tax rate $\tilde{\tau}_2$ and tax morale $\tilde{M}_2$ in period 2 in peacetime as the solution to the following system of equations:

$$[1 + H'(\tilde{\tau}_2 Y - \tilde{M}_2 - E_1)]Y^j = \theta(\tilde{\tau}_2)^{\theta-1}Y^\theta, \quad (21)$$

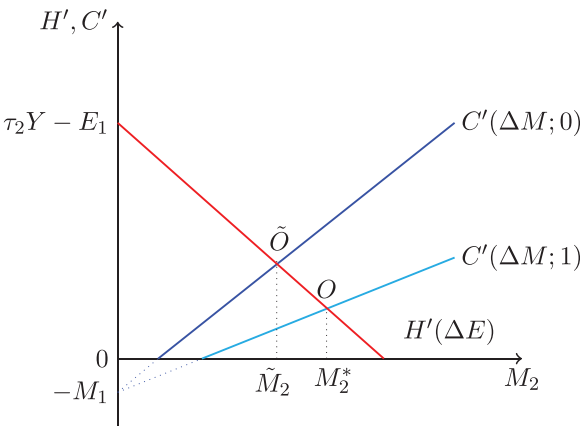$$C'(\tilde{M}_2 - M_1; 0) = H'(\tilde{\tau}_2 Y - \tilde{M}_2 - E_1). \quad (22)$$

FIGURE 2 The comparison of the equilibrium level of tax morale in wartime and peacetime [Colour figure can be viewed at wileyonlinelibrary.com]

From $(\tilde{\tau}_2; \tilde{M}_2)$ it follows that the optimal level of fiscal capacity and the provision of public good in the second period are respectively

$$\tilde{E}_2 = \tilde{\tau}_2 Y - \tilde{M}_2, \tag{23}$$

and

$$\tilde{Q} = \tilde{\tau}_2 Y. \tag{24}$$

Using the budget constraint in period 1 implies that the tax rate in period 1 required to finance the investments in fiscal capacity and tax morale reads

$$\tilde{\tau}_1 = \frac{C(\tilde{M}_2 - M_1; 0) + H(\tilde{E}_2 - E_1)}{Y}. \tag{25}$$

Figure 2 illustrates the equilibrium level of tax morale $\tilde{M}_2$ in peacetime that is obtained equalizing the marginal cost of expanding tax morale $C'(\Delta M, 0)$ and the marginal cost of expanding fiscal capacity $H'(\Delta E)$ (see Equation (22)), and compares it with the equilibrium level M_2^* in wartime. As the mobilization for war lowers the marginal cost of expanding the culture of tax compliance, $C'(\Delta M; 1) < C'(\Delta M; 0)$ for any level of M_2, it is immediate that, other things equal, the investment in tax morale is more convenient in wartime. Graphically, we have that C' shifts downward moving the equilibrium from $\tilde{M}_2$ to M_2^*, with $\tilde{M}_2 < M_2^*$. In other words, a comparison of Equations (22) and (14) yields that the government finds it optimal in peacetime to pursue its capacity to raise revenues by a relatively larger increase in fiscal capacity (ΔE) and a smaller increase in tax morale (ΔM) than in wartime.

The above results are summarized in the following proposition.

Proposition 2. *If the country does not face any threat ($\mu = 0$), then the government's optimal policy is the set $(\tilde{\tau}_2; \tilde{M}_2; \tilde{E}_2; \tilde{Q}; \tilde{\tau}_1)$ determined respectively by (21), (22), (23), (24), and (25). A given increase in revenues (i.e., a tax rate τ_2) in peacetime ($\mu = 0$) is implemented through a larger investment in fiscal capacity ΔE and a smaller increase in tax morale ΔM than in wartime ($\mu = 1$).*

FIGURE 3 The parents'
optimal level of effort in the
transmission of the values of tax
compliance
[Colour figure can be viewed at
wileyonlinelibrary.com]
Notes: γ, E, and M are the level of
the threat, fiscal capacity, and tax
morale, respectively. The
following inequalities hold: $\gamma' > \gamma$;
$E' > E$; $M' > M$.
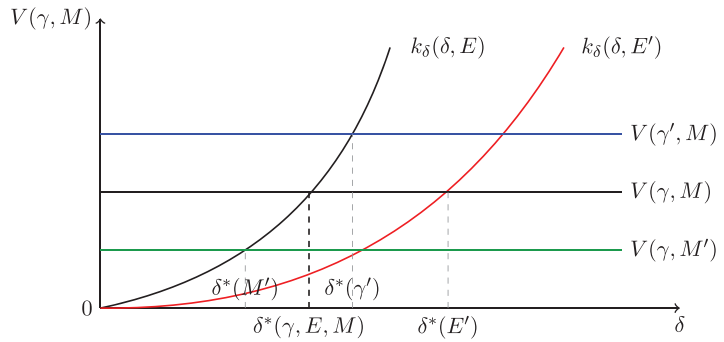
2.2.3 | The transmission of the values of tax compliance

In the previous section we have determined the optimal government policies in the two subperiods for each generation. We here analyze the transmission of political values from parents to children and determine the steady-state level of tax morale. Then, we will provide some comparative static analysis.

From (5) and the fact that $\eta = \delta$, it follows that the parents optimal level of effort δ^* in the transmission of their culture of tax compliance is the solution to the following maximization problem

$$\max_{\{\delta\}} \ \delta V(\gamma, M) - k(\delta, E). \tag{26}$$

Therefore, δ^* is implicitly defined by the following first-order condition:[13]

$$\Psi \equiv V(\gamma, M) - k_\delta(\delta^*, E) = 0. \tag{27}$$

The optimal level of effort $\delta^*(\gamma, E, M)$ exerted by parents that is reported in (27) requires that the marginal benefit $V(\gamma, M)$ from the transmission of the values of tax morality to children is equalized to its marginal cost $k_\delta(\delta^*, E)$. The former is increasing in the level of the threat γ and decreasing in the degree of parents' tax morale M (i.e., $V_\gamma > 0$, $V_M < 0$), while the latter is increasing in the effort δ of socialization ($k_{\delta\delta} > 0$) and decreasing in the level of fiscal capacity ($k_{\delta E} < 0$ due to the congruence effect). Therefore, it follows that $\delta^*(\gamma, E, M)$ is higher when there is more threat of conflict γ and larger fiscal capacity E, while a stronger culture of tax compliance M lowers δ^* (see the next proposition and Figure 3 for more details). This is because a higher threat γ makes the transmission of the values of tax compliance more salient, a more efficient fiscal apparatus E lowers the costs of such transmission, and higher values of tax morale M reduce the marginal benefit from their transmission to the offsprings.

Proposition 3. $\delta^*(\gamma, E, M)$ *is increasing in γ and E and decreasing in M.*

Proof. See the Appendix. □

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[13] The second-order condition of the maximization problem (26) is $-k_{\delta\delta}(\cdot) < 0$ and it is always satisfied since $k(\delta, E)$ is convex in δ.

The dynamic equation of tax morale across generations reported in (4) can be rewritten as follows:

$$M_{t+1} = (1 - \alpha(\gamma))M_t + \delta_t M_t \tag{28}$$

once we take into account that $\eta_t = \delta_t$. Hence, the equilibrium dynamics of M is represented by Equation (28) with $\delta_t = \delta_t^*(\gamma, E_t, M_t)$ given by (27). Therefore, the change of tax morale in the economy from generation t to generation $t + 1$ is

$$\Delta M_{t+1} \equiv M_{t+1} - M_t = -\alpha(\gamma)M_t + \delta_t^*(\gamma, E_t, M_t)M_t. \tag{29}$$

As the steady-state level of tax morale $\hat{M}$ is defined as that level for which $\Delta M_{t+1} = 0$, this will be implicitly defined by the following equation:

$$\Omega \equiv -\alpha(\gamma) + \delta^*(\gamma, E, \hat{M}) = 0. \tag{30}$$

The solution to (30) is unique as $\delta^*(\gamma, E, M)$ is decreasing in M. From Equation (30) it is immediate that the steady-state value of tax morale $\hat{M}(\gamma, E)$ depends on the intensity of conflict γ and on the level of fiscal capacity E. Then, let us analyze how these two factors affect the level of $\hat{M}$ (the details are reported in the proof of Proposition 4).

The effect of fiscal capacity E on the steady-state level of tax morale $\hat{M}(\gamma, E)$ is always positive,[14] that is $\partial\hat{M}(\gamma, E)/\partial E > 0$, and this is due to the fact that more efficient fiscal institutions make the transmission of the values of tax compliance less costly (congruence effect).

The effect of a higher threat γ on $\hat{M}(\gamma, E)$ is instead generally ambiguous as this is given by

$$\frac{\partial\hat{M}(\gamma, E)}{\partial\gamma} = \frac{-\alpha'(\gamma)k_{\delta\delta} + V_\gamma - k_{\delta E}\frac{\partial E}{\partial\gamma}}{-V_M}. \tag{31}$$

In fact, from $V_M < 0$ it follows that the denominator of (31) is always positive and, therefore, $\partial\hat{M}(\gamma, E)/\partial\gamma$ has the sign of the numerator:

$$\text{sign}\left\{\frac{\partial\hat{M}(\gamma, E)}{\partial\gamma}\right\} = \text{sign}\left\{-\alpha'(\gamma)k_{\delta\delta} + V_\gamma - k_{\delta E}\frac{\partial E}{\partial\gamma}\right\}. \tag{32}$$

Expression (32) highlights that an increase in the degree of conflict generates three effects on the transmission of the values of tax compliance. The first term in (32) comes from the negative effect of conflict on the culture of cooperation and trust that leads to a reduction of tax morality in the offsprings as threat increases. The second term represents the positive effect that the salience of conflict has on the desire of the parents to transmit their values of tax compliance to children. The third term is also positive and comes from the congruence effect (recall that $k_{\delta E} < 0$), that is, from the reduction of the parents' cost of transmission of the culture of tax compliance in presence of institutions that are congruent with such values.

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[14] There are various factors that may lead to an exogenous increase in fiscal capacity E such as a higher weight α attached by the agents in the society to defense.

From (32) we therefore obtain that

$$
\frac{\partial \hat{M}(\gamma, E)}{\partial \gamma} < 0 \quad \text{if } \alpha'(\gamma)k_{\delta\delta} > V_\gamma - k_{\delta E}\frac{\partial E}{\partial \gamma}, \tag{33}
$$
$$
> 0 \quad \text{if } \alpha'(\gamma)k_{\delta\delta} < V_\gamma - k_{\delta E}\frac{\partial E}{\partial \gamma}.
$$

While in general both cases in (33) are possible, if the congruence effect is sizeable following the existence of a relatively high degree of fiscal capacity (i.e., $k_{\delta E}$ is large at high levels of E), then we can argue that a higher intensity of conflict reduces the steady-state level of tax morale at low levels of fiscal capacity (i.e., $\partial \hat{M}(\gamma, E)/\partial \gamma < 0$ when E is low), and increases it ($\partial \hat{M}(\gamma, E)/\partial \gamma > 0$) for E large.

The following proposition summarizes the above results.

Proposition 4. *The steady-state level of tax morale $\hat{M}(\gamma, E)$ is implicitly defined by Equation (30). This value is unique and globally stable. Higher levels of fiscal capacity always increase the culture of tax compliance, $\partial \hat{M}(\gamma, E)/\partial E > 0$, while the effect of a higher threat γ is generally ambiguous. However, provided that the parents' utility gains from the transmission of the values of tax compliance to the offsprings are not too increasing in the level of threat γ (i.e., V_γ is not too large relatively to $\alpha'(\gamma)k_{\delta\delta}$), and that the congruence effect becomes large at high levels of fiscal capacity (i.e., $k_{\delta E}$ is relatively big for large values of E), then $\partial \hat{M}(\gamma, E)/\partial \gamma$ is likely to be negative for E relatively low and positive for E large enough.*

Proof. See the Appendix and the main text. □

2.3 | Discussion and summary of the results

The first contribution of our model is to provide a simple framework for modeling the efficiency of the fiscal apparatus (that is, *fiscal capacity*) and the role of the citizens' culture of tax compliance (i.e., *tax morale*) that jointly determine the capacity of the state to raise taxes (that we have defined as *state capacity* even though this term has generally a broader meaning). The framework is extended in a dynamic setting with the inclusion of the transmission of the parents' values to children to study the long run effects of war on tax morale. The analysis has led to four main results that can be summarized as follows. First, a higher degree of conflict induces governments to invest resources to increase both fiscal capacity and the citizens' culture of tax compliance. However, relatively high levels of fiscal capacity correspond to a lower increase in the investment in tax morale (i.e., the two instruments of state capacity are substitute). Second, the salience of the conflict for citizens may affect the decision of the government about which investment should be favored; if the marginal cost of increasing citizens' tax morale goes down because they do care about the outcome of the war, then the government may favor the investment in tax morale to the one in fiscal capacity. Third, we obtain that fiscal capacity and tax morale are complements in the long run in presence of congruence effects, namely when it is less costly for parents transmitting a culture of tax compliance to children in the presence of efficient fiscal institutions. Fourth, the effect of more conflict on the culture of tax compliance is generally ambiguous; however, if the congruence effect is large at high levels of fiscal capacity, then the effect of higher threat of war on

TABLE 1 Summary statistics

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

the steady-state level of tax morale is negative when fiscal capacity is relatively low and positive when the latter is large enough.

3 | EMPIRICAL EVIDENCE

In this section we present empirical evidence consistent with the main predictions of our theoretical framework. In particular, we focus on the relationship between conflicts and tax morale in countries with different levels of fiscal capacity.

3.1 | Data description

Our empirical analysis uses a large set of variables whose descriptive statistics are reported in Table 1.

The information on tax morale is taken from six waves of the World Values Survey (WVS; Inglehart et al., 2014) and European Values Study (EVS) for a period that covers more than 30 years, from 1980 (first wave) to 2012 (last wave). The two surveys report the interviewee's answer on a

1–10 scale to the following question (F116): "Cheating on taxes, if you have a chance, is: 1 = never justifiable, 10 = always justifiable." We rescaled this variable so that higher values correspond to higher degrees of individuals' tax morale, and compute weighted averages at a country-wave level. Overall, we collect 199 data points across 61 countries. As one can see from Table 1, tax morale ranges from 6.88 to 10, with higher values corresponding to countries with a population more willing to comply with taxes. The sample average tax morale is 8.76 and the standard deviation is 0.62.

We measure the country's exposure to conflicts using information from Correlates of Wars, COW (Sarkees & Wayman, 2010). From this source, we compute the *number of wars* fought by a country from the start of World War II (1939) (*i*) at the interstate level, (*ii*) within the country's territory against rebel groups, (*iii*) and the sum of both types of conflicts.[15] Alternatively, we use measures on the intensive margin of (the same) conflicts, by employing the *number of years* a country has been involved in external wars, internal ones, or both.

Table 1 reports the main summary statistics for these variables. We count an average of 1.28 (total) wars fought by a country from 1939 to 2010. However, we observe a large variation across countries (the standard deviation is 2.37): the United States and China have engaged in 7 and 6 international wars respectively, while many countries have never been involved in any kind of conflict. In terms of conflict intensity, the average (internal and external) war has a duration of 4.62 years. This means that about 8% of the total time we study is wartime; and since several countries have embarked in endless wars in the last 60 years, these data account for a substantial variation (the sample standard deviation is 9.21).[16]

For the measures of fiscal capacity, we rely on Besley and Persson's (2009) version of the IMF data on taxes. Their dataset covers the 1975–2000 period and employs the period average of the following four measures. The first is the share of income taxes in GDP expressed in percentage terms. The intuition for using this index as the country's level of fiscal capacity is that income is typically difficult to tax because it is relatively easy to conceal. A country with little investments in efficient fiscal infrastructure is then likely to have a low share of income taxes in GDP. The sample average income tax to GDP ratio in our sample is about 15% (the range of variation is from 0.30% to 34.60%). The second measure is the share of overall taxes in GDP that is rather intended as a "catch-all" measure of fiscal capacity; the sample average tax share in GDP is 26.62% in the range 2.21–50.81. We also use the share of the revenues from trade taxes and the share of the revenues from indirect taxes as indices of poor fiscal capacity; governments in countries with limited fiscal capacity, in fact, tend to use border taxes, because they are the easiest to track. To simplify the interpretation of our estimates, we want all measures of fiscal capacity to be increasing in it and, therefore, we have rescaled the last two variables as follows: 100 minus the share of the revenues from trade taxes, and 100 minus the share of the revenues from indirect taxes. From Table 1 we observe that the sample means of these variables are 58.03% and 41.77%, respectively.

We collected a set of additional variables that we include in the regressions to estimate meaningful correlations between wars and tax morale. In particular, we use the (logarithm of) GDP per

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[15] 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 et al. (2008) on the United States experience. However, our results are also robust to the exclusion of the 1939–45 period.

[16] The variation in the number of civil conflicts is also substantial: for example, Indonesia has fought 9 civil wars, whereas other countries have never experienced internal conflicts. The Philippines fought for more than 40 years: its government first engaged in a 20-year civil war (*guerilla* campaign) against the New People's Army (1972–92), then with a minoritarian Muslim group, and finally with the Moro population. Similarly, Colombia's government fought for about 33 years against the *guerilla* Revolutionary Armed Forces of Colombia (FARC).

capita (PPP in constant 2011 international dollars) and the (logarithm of the) population to control for the size of the country; both variables come from the World Development Indicators database and are country averages between 1980 and 2012. We include in all specifications an index of ethnic fragmentation (from Alesina et al., 2003) to take into account the potential conflict over public goods provision that might encourage or discourage tax compliance, as well as an index of corruption and one on the government effectiveness that are both taken from the World Government Indicators database (Kaufmann et al., 2011).[17] To control for cultural and legal traditions, our estimates include the population shares of major religions (Catholic, Protestant, and Muslim) in the 1980s and the country's legal origin (La Porta et al., 1999).

3.2 | Empirical strategy

Using the above-described variables, we estimate the following regression:

$$TaxMorale_{it} = \theta_0 + \theta_1 War_i + \theta_2 \tau_i + \theta_3 (War_i \times \tau_i) + X_i' \phi + \eta_t + \varepsilon_{it}, \tag{34}$$

where i indicates the countries and t the survey waves. War_i is either the number of interstate conflicts, or of civil wars, or their sum for country i.[18] τ_i is one of the four measures of fiscal capacity discussed above. X_i is a vector of controls, whereas η_t is a set of year fixed effects that we introduce to capture year specific shocks on tax morale common to all countries.

Equation (34) allows us to establish the relationship between war and tax morale in countries with different fiscal capacity τ_i, holding fixed a number of factors included in X_i. As we allow war exposure and fiscal capacity to be interdependent factors in explaining the variation in the culture of tax compliance, the effect of wars on tax morale depends on the level of fiscal capacity. Hence, the marginal effect of conflict on tax morale is given by $m(\tau_i) = \theta_1 + \theta_3 \times \tau_i$. According to our theory, we expect $m(\tau_i)$ to be negative for relatively low levels of fiscal capacity τ_i and positive for high levels of it. In words, we expect conflicts to be positively associated with a culture conducive to tax compliance when the country's fiscal capacity is high; the exposure to war is instead expected to be culture disruptive, and therefore associated with a low level of tax morale, in countries where fiscal capacity is limited.

It is worth remarking that conflict occurrence is counted at the country level and, therefore, standard errors ε_{it} are clustered at this level to account for residual within-country correlation.

3.3 | Results

Table 2 presents the main results of our empirical analysis. The table uses *the number of wars* (internal, external, and total) as a proxy of (the extensive margin of) conflicts and *the share of income taxes in GDP* as a measure of fiscal capacity to estimate their effects on the level of tax morale. All estimates in the table include the (logarithm of the) GDP per capita, the (logarithm of the) size of the population, the degree of ethnic fragmentation, the population shares of major

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[17] Both indices are computed as country-level averages between 1996 (the first year reported) and 2014. It is worth noting that the quality of the government might affect the extrinsic motivations to pay taxes or favor reciprocity with the state.

[18] When we use the measures of the intensive margin of conflicts, War_i will be the number of years of the just cited wars for country i.

TABLE 2 Effects of the number of wars and income taxes in GDP on tax morale

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
income taxes	−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 × income taxes			0.011***				
			(0.003)				
# inter. wars				0.035	−0.197**		
				(0.057)	(0.080)		
# inter. wars × income taxes					0.013***		
					(0.004)		
# civ. wars						−0.047	−0.348**
						(0.077)	(0.149)
# civ. wars × income taxes							0.043***
							(0.019)
Observations	193	193	193	193	193	193	193
R^2	0.187	0.153	0.238	0.156	0.212	0.160	0.249

Note: Dependent variable is tax morale. All specifications include the logarithm of the GDP per capita, the logarithm of the population, the ethnic fragmentation index, the population shares of major religions, legal origin dummies, and year fixed effects. Standard errors are clustered at the country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

religions, and dummies for the legal origin to control for factors that can potentially affect simultaneously the level of fiscal capacity, the historical exposure to conflict and the formation of a culture of tax compliance in a country. In the Online Appendix we provide additional evidence that shows that using other measures of fiscal capacity or the intensive margin of conflicts (i.e., the number of years under war) does not change our findings.

Table 2 has seven columns. In column (1), we estimate a statistically significant negative correlation between fiscal capacity and tax morale: citizens in countries with higher shares of income taxes in GDP display a lower willingness to comply with taxes. Column (2) shows the absence of a statistically significant correlation between citizens' tax morale and the past exposure to total conflicts when we do not control for the country's degree of fiscal capacity. In column (3), we report the estimated coefficients of Equation (34) where fiscal capacity and the total number of wars, as well as their interaction term, are all included in the regression. We find that the estimated coefficients of fiscal capacity and wars are both negative; the interaction term has a positive sign; these coefficients are all statistically significant at standard levels. This result brings support in favor of our theoretical findings on the existence of a complementary between war and fiscal capacity in determining the tax morale trajectory: war has disruptive consequences on the culture of tax compliance in countries with limited fiscal capacity and positive effects in states with a substantial capacity for extracting revenues from citizens. Columns (5) and (7) show that the same qualitative results hold irrespective of the type of wars we look at, interstate or internal ones. Columns (4) and (6) confirm the absence of a statistically significant relationship between (external and internal) conflicts and tax morale when fiscal capacity is not controlled for.[19]

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[19] In Table A1 in the Online Appendix, we replicate Table 2, by controlling for a linear time trend (T_t) and a linear time trend specific to a given share of income taxes in GDP (i.e., $T_t \times \tau_i$) in place of the year fixed effects. Transmitting values of
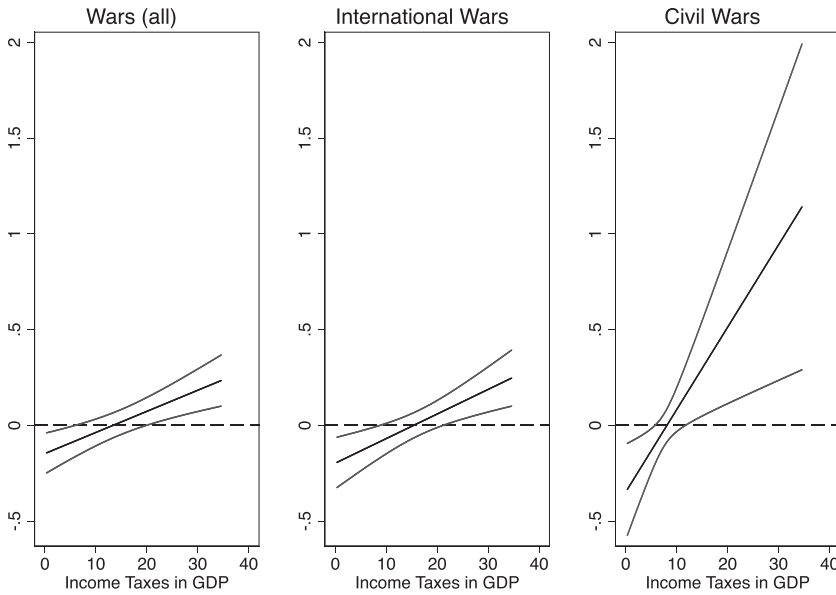
FIGURE 4 Marginal effects of conflict exposure on tax morale for various shares of income taxes in GDP

The estimated marginal effects of (the number of total) wars on tax morale for any level of fiscal capacity are displayed in Figure 4. The figure is composed of three panels. The left-hand panel, obtained from the estimate reported in column (3) of Table 2, contains the marginal effects of war on tax morale (in the y-axis) for different shares of income taxes in GDP (in the x-axis). The central line represents the point estimate of such marginal effect; the two upper and lower bands describe the interval estimate at a 90% confidence level. Similarly, the mid panel (obtained from column (5)) and the right-hand panel (that uses column (7)) show the estimated marginal effects of war on tax morale when we employ the number of external and internal wars, respectively, to measure a country's conflict exposure.

From the left-hand panel of Figure 4 it emerges that the estimated marginal effect of wars on tax morale increases with fiscal capacity. It is negative for the countries that, in our sample, have a low level of the income tax to GDP ratio, say a level below 5.7, and is positive for the countries that exhibit a high level of it, say a level above 20. For illustrative purposes, consider the set of countries whose income taxes weigh the 0.30% of the GDP. For these countries, we estimate that a standard deviation increase in war exposure is associated with a decrease in tax morale of about one half of its standard deviation (i.e., $\frac{-0.14 \times 2.37}{0.62}$, where 2.37 is the standard deviation of conflict occurrence and 0.62 is the standard deviation in tax morale). If we rather examine countries where income taxes weigh considerably, we estimate an effect that is almost a standard deviation increase in tax morale when war exposure exceeds the mean by one standard deviation (i.e., $\frac{0.23 \times 2.37}{0.62}$). These countries, in our sample, have an income tax to GDP ratio of 34.6.

Using the number of interstate or civil wars as alternative proxies of conflict exposure does not change qualitatively our conclusions. However, it is worth remarking that the magnitude of the

tax compliance to the new generations is relatively more efficient in the former group of countries; hence, tax morale may evolve at a relatively faster pace. Our analysis shows that our findings are not sensitive to the inclusion of a differential time trend between high- and low-fiscal capacity countries.

marginal effects is larger when we only use a record of civil conflicts. As shown in the right-hand panel of Figure 4, this occurs in both the two tails of the cross-country distribution of the income tax to GDP ratio (the x-axis). For instance, when looking at countries with the lowest income tax to GDP ratio (0.30%), our estimates indicate that an increase in the standard deviation in the number of civil wars is associated with a reduction in a country's tax morale of 0.77 standard deviations (i.e., $\frac{-0.33 \times 1.45}{0.62}$, where 1.45 is the standard deviation of internal conflict occurrence). When looking at the other end of the distribution (i.e., at countries with an income tax to GDP ratio of 34.6) we obtain that a standard deviation increase in civil wars is associated with a concomitant increase of 2.67 standard deviations in tax morale (i.e., $\frac{1.14 \times 1.45}{0.62}$). Note that this effect is four times larger than the one we obtain when using international wars (i.e., $\frac{0.25 \times 1.61}{0.62} = 0.65$, where 1.61 is the standard deviation of external conflict occurrence).

We check whether our results are sensitive to the specific use of income taxes in GDP to measure fiscal capacity. In Table A2 in the Online Appendix we repeat the same analysis using the share of overall taxes in GDP; in Tables A3 and A4 we replicate the analysis by measuring fiscal capacity with (100 minus) the share of the revenues from trade taxes and (100 minus) the share of the revenues from indirect taxes, respectively. Marginal effects are illustrated in Figures A2, A3, and A4. Irrespective of the specific index employed, we find that the exposure to conflict has a negative effect on tax morale in countries with low fiscal capacity, and a positive effect in countries with large fiscal infrastructures. We also find in these analyses that the effects of civil wars exposure are larger than those carried out by the exposure to international disputes.

As a further robustness check, we have replicated the analysis using the intensive margin of conflict exposure (that is, the number of years at war) in place of its extensive margin (number of wars). Although the two measures deliver different information on the characteristics of a country's conflict record, they are highly correlated (correlation is 0.86). Not surprisingly, the results of the regressions are basically unchanged. These robustness checks are presented in Tables A5, A6, A7, and A8 in the Online Appendix where the proxies for fiscal capacity are the share of income taxes in GDP, the share of overall taxes in GDP, (100 minus) the share of the revenues from trade taxes, and (100 minus) the share of the revenues from indirect taxes, respectively. In all these alternative specifications we find negative estimated coefficients for fiscal capacity and wars, and a positive coefficient for the interaction term. Likewise, Figures A5, A6, A7, and A8 trace marginal effects for different values of the cross-country distribution of fiscal capacity. In all these graphs we find similar magnitudes and the same pattern across levels of fiscal capacity.[20]

3.4 | Endogeneity concerns

One potential concern behind our analysis is endogeneity. If, for example, conflicts and motivations to comply with taxes were related through unobserved channels or if conflicts were explained by tax morale our OLS estimates would be biased. In this section, we borrow from a large literature on the spatial transmission of civil wars to instrument variation in civil wars occurrence using a historical record of conflict exposure of culturally and geographically proximate countries.[21] This

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[20] We note that clustered standard errors are slightly bigger because of a more dispersed cross-country distribution of years of wars.

[21] As we explain below, our analysis relies on the assumption that a country's level of tax morale is explained by the historical record of conflicts, that occurred in neighboring countries, only because proximity to conflict is likely to increase

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literature points out to cross-border and spatial contagion as crucial determinants of the spatial distribution of civil wars, that in spite of their domestic nature tend to cluster around regions that involve more than one country (Salehyan & Gleditsch, 2006; Buhaug & Gleditsch, 2008; Silve & Verdier, 2018).[22] Similarities between neighboring countries make the formation of these regional clusters of civil wars more likely, because the conflict increases the salience of these similarities and bonds for members of the same group (Forsberg, 2014; Böhmelt & Bove, 2020). The conflicts in Kosovo and Macedonia involving Albanians or the wars involving Rwanda's and Burundi's Hutus and Tutsis are just two examples of internal disputes that spilled over proximate countries because of the presence of transnational groups (e.g., Albanians, Hutus, Tutsi). We thus exploit an empirical strategy where cultural proximity increases the probability of a civil conflict contagion in a geographically proximate country.

Following Guiso et al. (2009), we measure cultural proximity by using closeness in religious values. Religion in fact has an important role in determining the way people interact with each other and in influencing the transmission of values at school and within a family. Thus, it affects people's values and beliefs helping reduce the distance between citizens from different countries.[23] Using information collected by the WVS/EVS on the share of religious adherence, we derive a measure of religious distance as the sum of the quadratic distances between the share of adherence to religion r in the country i (x_{ir}) and the share of adherence to the same religion r in the country j (x_{jr}), where j is a country which belongs to the set of geographically proximate states to country i. Such index can be written as follows:

$$\xi_{ij} = \sum_r (x_{ir} - x_{jr})^2. \tag{35}$$

Our instrument, Z_i, is the average number of civil wars in culturally and geographically proximate countries:

$$Z_i = \left[\frac{1}{N_i} \sum_{j=1}^{N_i} \text{civil wars}_j \,\big|\, \xi_{ij} < \xi^* \text{ and } d_{ij} < d^* \right], \tag{36}$$

where N_i is the number of neighboring countries, ξ^* is the cut-off religious distance, d^* is the cut-off geographical distance, and d_{ij} is the geographical distance between the countries dyad. Only countries with $\xi_{ij} < \xi^*$ and $d_{ij} < d^*$ are included in the computation of the mean.

Figure 5 reports the map of Uganda and its proximate countries to illustrate how Z_i is computed in practice. Uganda shares its border with Sudan, Kenya, Tanzania, Rwanda, and the Democratic Republic of Congo (the latter country is not in our sample however). We map the number of civil wars that occurred from 1939 to 2010 in each of them, with darker shades indicating a higher historical exposure to civil conflict. The bar located in the centroid of the country polygon indicates how distant this country culturally is from Uganda (i.e., ξ_{ij}). As one can see, Sudan—a predominantly Muslim country—is the culturally furthest away. The horizontal line within the bar stands

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domestic conflict. As international wars are, by definition, combated by multiple countries the exclusion restriction is unlikely to hold. To check the validity of our OLS estimates, we then turn exclusively to civil wars.

[22] See Di Salvatore & Ruggeri (2021) for a methodological overview of the diffusion of conflicts across states.

[23] Guiso et al. (2009), for instance, show that individuals trust more foreigners if the latter belong to the same religious profession.

FIGURE 5 Historical records of civil wars in Uganda and contiguous countries [Colour figure can be viewed at wileyonlinelibrary.com]

Notes: The figure maps the historical records of civil wars in Uganda and contiguous countries (Sudan, Kenya, Tanzania, and Rwanda) which are part of our sample. Darker shades indicate a higher historical exposure to domestic civil conflict. The bar located in the centroid of proximate countries' polygon indicates how distant this country culturally is with Uganda (i.e., ξ_{ij}), while the horizontal line stands for ξ^*. In our analysis we set $\xi^* = 0.3$.
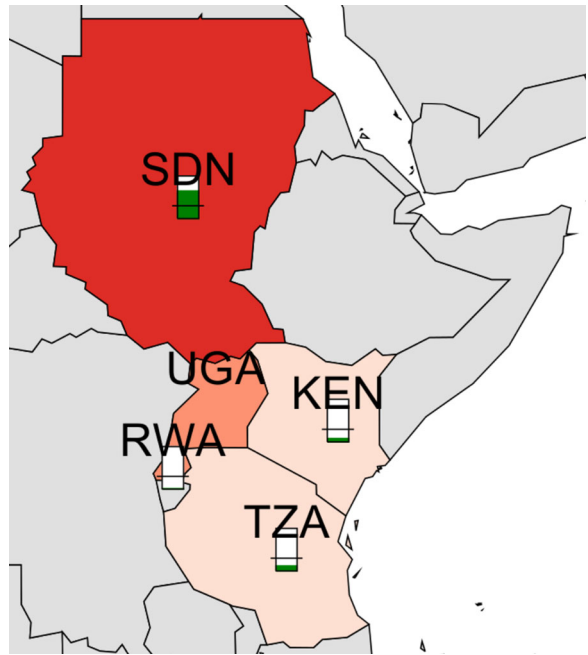
for ξ^*. In our analysis we set $\xi^* = 0.3$.[24] The index of religious distance is well above the bar for Sudan, which is therefore not in the set of countries that are culturally proximate to Uganda. As a result of it, we instrument Uganda's exposure to civil wars using the mean of those that occurred in Kenya, Tanzania, and Rwanda.[25]

Our IV strategy selects plausibly exogenous variation in War_i and $(War_i \times \tau_i)$ estimated through the two following first-stage equations:

$$\widehat{War}_i = \pi_{10} + \pi_{11} Z_i + \pi_{12} \tau_i + \pi_{13} (Z_i \times \tau_i) + X_i' \pi_{14} + \eta_t + u_{it}, \tag{37}$$

$$(\widehat{War_i \times \tau_i}) = \pi_{20} + \pi_{21} Z_i + \pi_{22} \tau_i + \pi_{23} (Z_i \times \tau_i) + X_i' \pi_{24} + \eta_t + v_{it}. \tag{38}$$

The coefficients of interest are thus ϑ_1 and ϑ_3 in the following second-stage equation which is estimated through 2SLS:

$$TaxMorale_{it} = \vartheta_0 + \vartheta_1 \widehat{War}_i + \vartheta_2 \tau_i + \vartheta_3 (\widehat{War_i \times \tau_i}) + X_i' \varphi + \eta_t + \varepsilon_{it}. \tag{39}$$

In Table 3 we report our estimates using our chief measure of fiscal capacity: the share of income taxes in GDP. Column (1) reports the OLS estimates for easiness of comparison and column (2) presents the 2SLS estimates. As one can see, the estimated coefficients are all statistically

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[24] Varying ξ^* in a neighborhood of 0.3 changes little to our analysis. When we set a larger threshold we include more countries that are culturally very distant. Consequently, we find a smaller correlation in the number of past civil wars experienced by a country and its neighboring ones.

[25] In Figure A9 in the Online Appendix we provide another example in a highly culturally homogeneous area around the country of Colombia.

TABLE 3 Effects of the number of wars and income taxes in GDP on tax morale – IV estimates

	(1)	(2)	(3)	(4)	(5)
	OLS	**2SLS**	**First stage**		**Reduced form**
income taxes	−0.030***	−0.045***	−0.033	−0.113	−0.026***
	(0.009)	(0.015)	(0.021)	(0.181)	(0.009)
# civ. wars	−0.348**	−0.841**			
	(0.149)	(0.383)			
# civ. wars × income taxes	0.043**	0.083*			
	(0.019)	(0.046)			
# civ. wars in neighbors			0.061	−0.181	−0.066***
			(0.048)	(0.356)	(0.017)
# civ. wars in neighbors × income taxes			−0.015*	−0.066	0.007*
			(0.008)	(0.058)	(0.004)
F-statistics on the excluded instruments			164.83	13.44	
Observations	193	193	193	193	193
Adjusted R^2	0.249	0.025	0.397	0.182	0.229

Note: Dependent variable is tax morale in columns (1), (2), and (5), domestic civil wars in column (3), and domestic civil wars times share of income taxes in GDP in column (4). All specifications include the logarithm of the GDP per capita, the logarithm of the population, the ethnic fragmentation index, the population shares of major religions, legal origin dummies, and year fixed effects. Standard errors are clustered at country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

significant at the 5% level of confidence. More importantly, they are larger than the OLS estimates suggesting that the latter are biased toward zero. Columns (3) and (4) report the first-stage estimates of Equations (37) and (38). While coefficients are imprecisely estimated, column (3) points at a positive correlation between domestic and proximate countries' conflict. More importantly, we note that the F-statistics on the excluded instruments are big and in any case larger than 10—the threshold suggested by Stock et al. (2002)—suggesting that our estimates are unlikely to be affected by a weak instrument problem.[26] Finally, column (5) reports the reduced form estimates. Importantly, the three estimated coefficients are all statistically different from zero suggesting the existence of a causal effect of civil wars occurrence and fiscal capacity on tax morale.

In sum, these additional results, while not conclusive on the causal effects of civil wars on tax morale, suggest that our OLS estimates presented in Table 2 are not upward biased. They rather suggest that the true effect is potentially larger—an argument that would require better data and further analyses to explore.

4 | CONCLUSIONS

This paper analyzed how war shapes fiscal capacity and tax morale in a dynamic framework where governments invest resources in both instruments to raise the necessary revenues to face the threat, and parents transmit their culture of tax compliance to children. We obtain that while

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[26] The Kleinbergen–Paap F-statistics, which correct for the clustering of the standard errors, are below 10 but just-identified IV models, as ours, are median-unbiased and therefore unlikely to suffer from the employment of a weak instrument (e.g., Angrist & Pischke, 2008, p. 213).

fiscal capacity and tax morale are initially substitutes, a dynamic complementarity may arise in the dynamic equilibrium leading to the comovement of the values of tax compliance and fiscal capacity over time. While the relationship between intensity of conflict and the culture of tax compliance is generally ambiguous, we find that under reasonable conditions the effect of war on tax morale is negative when fiscal capacity is relatively low and positive when the latter is large enough.

We also presented a cross-country analysis whose results are consistent with the findings of our theory. The estimates show that war frequency (either internal or external) explains tax morale variations across countries and outline the existence of relevant heterogeneous effects depending on the level of fiscal capacity. In particular, countries with a consolidated level of fiscal capacity have citizens with a more developed culture of tax compliance if they have been exposed to more conflicts in the past. This effect is sizeable as it explains about one standard deviation in tax morale when the income tax to GDP ratio is used as a measure of fiscal capacity. Conversely, we find a negative marginal effect of war exposure on the culture of tax compliance in countries with limited fiscal capacity. The positive and negative effects of war on tax morale are quantitatively much larger when the source of conflicts are internal rather than external. Our results are robust to different measures of fiscal capacity, namely when the tax to GDP ratio, or the share of the revenues from trade, or indirect taxes are used in place of the share of income taxes in GDP, and to different proxies for the intensity of conflict, that is, when the number of years in war are used in place of the number of wars.

The results of an instrumental variable analysis where the exposure to internal conflicts is instrumented with the exposure to civil wars in culturally and geographically proximate countries suggest that the OLS estimates are slightly biased towards zero. This finding helps us interpret causally the effects of conflict exposure on tax morale for various levels of fiscal capacity, although we remark that a deeper investigation is needed to assess the causal impact of war on the culture of tax compliance.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

APPENDIX A: PROOFS

Assumption 1

Condition (i) is immediate. Regarding Condition (ii) the problem we are analyzing is interesting as long as the optimal level of provision of G in period 2 for group j requires a positive investment in state building. This is not the case if the optimal tax rate $\tau_2^{j,NI}$ satisfies the paying taxes constraint (3) at period 2 with $\Delta E = \Delta M = 0$—that is, if

$$\tau_2^{j,NI} Y \leq E_1 + M_1, \tag{A.1}$$

where

$$\tau_2^{j,NI} = \underset{\{\tau_2, G\}}{\arg\max} \ V^j = (1 - \tau_2)Y^j + \gamma \rho^j G^\beta \tag{A.2}$$

$$\text{subject to:} \quad G = \tau_2 Y \tag{A.3}$$

and therefore

$$\tau_2^{j,NI} = \left(\frac{\gamma \rho^j \beta Y^\beta}{Y^j} \right)^{\frac{1}{1-\beta}}. \tag{A.4}$$

If (A.1) does not hold, then the optimal level of state capacity at period 2 requires an investment in state building in the first period and, therefore, ΔE and/or ΔM will be positive. We assume that the set of parameters is such that (A.1) is never satisfied (e.g., the level of threat γ and/or the taste for defense ρ^j are large enough, and/or the initial level of state capacity, $E_1 + M_1$, is relatively low) and therefore investing in fiscal capacity in the first period is always optimal.

Second-order conditions for the maximization problems

The second-order conditions for the maximization problem (10) in wartime are the following:

$$V_{\tau\tau}^j < 0, \ V_{MM}^j < 0, \ \text{and} \ V_{\tau\tau}^j V_{MM}^j < (V_{\tau M}^j)^2, \tag{A.5}$$

where the subscripts denote the partial derivatives of $V^j(\mu = 1)$.

From (11) it follows that

$$V_{\tau\tau}^j \equiv -Y^j Y H''(\tau_2 Y - M_2 - E_1) - (1 - \beta)\rho^j \gamma \tau_2^{\beta-2} Y^\beta < 0, \tag{A.6}$$

as $H''(\cdot) < 0$. From (12) we obtain that

$$V_{MM}^j \equiv -\frac{Y^j}{Y}\left[C''(M_2 - M_1; 1) + H''(\tau_2 Y - M_2 - E_1)\right] < 0, \tag{A.7}$$

as $C''(\cdot) < 0$. Moreover, from the above expressions one can easily check that

$$V_{\tau M}^j = V_{M\tau}^j \equiv Y^j H''(\tau_2 Y - M_2 - E_1) > 0. \tag{A.8}$$

One can easily verify by using (A.6), (A.7) and (A.8) that, after some simplifications, condition $V_{\tau\tau}^j V_{MM}^j < (V_{\tau M}^j)^2$ reduces to

$$\left(Y^j\right)^2 H''(\tau_2 Y - M_2 - E_1)C''(M_2 - M_1; 1)$$

$$+(1 - \beta)\beta\rho^j\gamma\tau_2^{\beta-2}Y^{\beta-1}Y^j\left[C''(M_2 - M_1; 1) + H''(\tau_2 Y - M_2 - E_1)\right] > 0, \tag{A.9}$$

which always holds as all components are positive.

Following the same steps above, one can easily verify that the second-order conditions for the maximization problem (18) in peacetime are also satisfied as:

$$V_{\tau\tau}^j \equiv -Y^j Y H''(\tau_2 Y - M_2 - E_1) - (1 - \theta)\theta\tau_2^{\theta-2}Y^\theta < 0, \tag{A.10}$$

$$V_{MM}^j \equiv -\frac{Y^j}{Y}\left[C''(M_2 - M_1; 0) + H''(\tau_2 Y - M_2 - E_1)\right] < 0, \tag{A.11}$$

$$V_{\tau M}^j = V_{M\tau}^j \equiv Y^j H''(\tau_2 Y - M_2 - E_1) > 0 \tag{A.12}$$

and the condition $V_{\tau\tau}^j V_{MM}^j < (V_{\tau M}^j)^2$ reduces to

$$\left(Y^j\right)^2 H''(\tau_2 Y - M_2 - E_1)C''(M_2 - M_1; 0)$$

$$+(1 - \theta)\theta\tau_2^{\theta-2}Y^{\theta-1}Y^j\left[C''(M_2 - M_1; 0) + H''(\tau_2 Y - M_2 - E_1)\right] > 0, \tag{A.13}$$

which always holds.

Proof of Proposition 3

Applying the implicit function theorem to Equation (27) we obtain that

$$\frac{\partial\delta^*(\gamma, E, M)}{\partial\gamma} = -\frac{\partial\Psi/\partial\gamma}{\partial\Psi/\partial\delta} = -\frac{V_\gamma - k_{\delta E}\frac{\partial E}{\partial\gamma}}{-k_{\delta\delta}} = \frac{V_\gamma - k_{\delta E}\frac{\partial E}{\partial\gamma}}{k_{\delta\delta}} > 0 \tag{A.14}$$

as V_γ and $k_{\delta\delta}$ are both positive, $k_{\delta E} < 0$ and $\partial E/\partial\gamma \geq 0$ from Proposition 1.

Similarly, we have

$$\frac{\partial \delta^*(\gamma, E, M)}{\partial E} = -\frac{\partial \Psi/\partial E}{\partial \Psi/\partial \delta} = -\frac{-k_{\delta E}}{-k_{\delta\delta}} = -\frac{k_{\delta E}}{k_{\delta\delta}} > 0 \tag{A.15}$$

from $k_{\delta E} < 0$ and $k_{\delta\delta} > 0$.

And finally

$$\frac{\partial \delta^*(\gamma, E, M)}{\partial M} = -\frac{\partial \Psi/\partial M}{\partial \Psi/\partial \delta} = -\frac{V_M}{-k_{\delta\delta}} = \frac{V_M}{k_{\delta\delta}} < 0 \tag{A.16}$$

since $V_M < 0$ and $k_{\delta\delta} > 0$.

Proof of Proposition 4

The relationship between the steady-state level of tax morale $\hat{M}(\gamma, E)$ and fiscal capacity E can be obtained by applying the implicit function theorem to Equation (30) and it reads

$$\frac{\partial \hat{M}(\gamma, E)}{\partial E} = -\frac{\partial \Omega/\partial E}{\partial \Omega/\partial M} = -\frac{\frac{\partial \delta^*(\gamma, E, M)}{\partial E}}{\frac{\partial \delta^*(\gamma, E, M)}{\partial M}} = -\frac{-\frac{k_{\delta E}}{k_{\delta\delta}}}{\frac{V_M}{k_{\delta\delta}}} = \frac{k_{\delta E}}{V_M} > 0 \tag{A.17}$$

as $k_{\delta E}$ and V_M are both negative.

To determine the effect of higher conflict γ on $\hat{M}(\gamma, E)$ we apply the implicit function theorem to Equation (30) from which it follows that

$$\frac{\partial \hat{M}(\gamma, E)}{\partial \gamma} = -\frac{\partial \Omega/\partial \gamma}{\partial \Omega/\partial M} = -\frac{-\alpha'(\gamma) + \frac{\partial \delta^*(\gamma, E, M)}{\partial \gamma}}{\frac{\partial \delta^*(\gamma, E, M)}{\partial M}} = -\frac{-\alpha'(\gamma) + \frac{V_\gamma - k_{\delta E}\frac{\partial E}{\partial \gamma}}{k_{\delta\delta}}}{\frac{V_M}{k_{\delta\delta}}}, \tag{A.18}$$

where we have used (A.14) and (A.16). Rearranging terms we obtain the expression in (31):

$$\frac{\partial \hat{M}(\gamma, E)}{\partial \gamma} = \frac{-\alpha'(\gamma)k_{\delta\delta} + V_\gamma - k_{\delta E}\frac{\partial E}{\partial \gamma}}{-V_M}. \tag{A.19}$$

The remaining part of the proof is reported in the main text.