National Identity, Public Goods, and Modern Economic Development*

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Abstract

Since the Industrial Revolution, large-scale economic development has coincided with the rise of the modern nation-state. We argue that this is not a coincidence. In this paper, we demonstrate how the advent of *national identity* helped modern states overcome internal conflicts to provide public goods and grow. Using a model with elites and commoners, characterized initially by distinct group identities (e.g., ethnicity, class), we show that elites have an incentive to induce commoners to identify with the nation. The more commoners identify with the nation, the less is conflict between elites and commoners, and the more revenues can be collected and public goods broadly provided. This effect is self-reinforcing: the greater is public goods provision, the larger is the national income and thus the return on national identification. Elites' incentives to induce national identification, however, depend on the presence of restraints on the elite. We provide two pieces of evidence consistent with the theory. First, we revisit the development of the English state, identifying a central role for national identity therein. Second, we build a new time-varying measure of national identification for countries, establishing correlations that corroborate the theory.

Keywords: national identity, public goods, conflict, development and growth

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1 Introduction

Since the Industrial Revolution, large-scale economic development and growth have coincided with the rise of the modern state.[1] In recent decades, economists and political scientists have established a strong empirical relationship between economic performance and various aspects of state development, including state capacity (Besley & Persson, 2011; Johnson & Koyama, 2017) and institutions more generally (Acemoglu *et al.*, 2001; North & Weingast, 1989). Critically, modern states provide vast resources to public goods that favor economic development, including internal and external security, public education, transportation infrastructure, and various forms of social insurance (Lindert, 2004).

Although states can promote economic development, in principle, by providing certain public goods or by investing in the capacity to do so, major obstacles exist in practice. Most fundamentally, ruling elites face the challenge of securing public acquiescence to the state itself. Otherwise, they risk intruding on a variety of groupings, each with the potential for violence in defense of its interests. Indeed, internal conflicts continually mar the paths to both economic and state development. England went through a Civil War and the Glorious Revolution in the 17th century before finding some institutional stability that built the momentum toward the Industrial Revolution. France went through its Revolution, followed by a period of military conflict and subsequent autocratic governance that, nevertheless, radically changed its pre-revolutionary economic and political state. The United States seceded from Britain after its own Revolution but did not begin to resolve its economic, political, and cultural polarization between North and South until its own Civil War in the 1860s.[2]

In this paper, we analyze the role of *national identity* in helping modern states overcome such internal conflicts to provide public goods and grow. Relative to their pre-modern antecedents, modern states assiduously cultivate national identity through public schooling, the symbolism of national flags, anthems, and rituals, and information campaigns that third parties may call propaganda (Alesina *et al.*, 2020; Bandiera *et al.*, 2019; Paglayan, 2021). Likewise, citizens of modern states often see themselves as part of "one people," members of large "imagined communities" that would have been difficult to establish before the spread of centralized education and print media (Anderson, 1983).

National identity, we argue, helps to forge a consensus between ruling elites and the masses over the distribution of economic benefits. Insofar as elites and the masses share a common identity, revenues can be readily collected and public goods broadly provided with little political conflict. To demonstrate our argument, we develop a formal model that incorporates identity as an important factor in individual decision-making. The model assumes two types of agents: (i) commoners and (ii) members of the elite. The identities of elites by definition constitute the *national* identity. Commoners, meanwhile, begin with an *alternative* identity but can choose to instead identify with the nation. Group identification is defined in terms of preferences, with psychological payoffs that emanate from the identity to which one adheres.

Concretely, identity confers some payoff associated with the *status* of the group with which one identifies. Among national identifiers, for instance, this status depends partly on the national income

[1] In this paper, the "modern state" refers to novel forms of political organization that spread throughout the world after the 18th century. These are characterized, for instance, by popular recognition of state sovereignty, national citizenship, and identification among the citizenry with the state. For relevant analyses of the modern state, see Finer (1997) and Mann (1993).

[2] Of course, external wars and many internal conflicts—such as the Jabobite rebellions, numerous "riots," and the problems with incorporating the "Celtic fringe"—continued to be part of England's modern evolution. Likewise, internal and external turmoil have characterized France and the United States' histories since these respective events Yet today, Britain, France, and the U.S. are exemplars of the successful modern state and economic development. Much of the rest of the world has gone through even more turmoil and typically with far less to show for in terms of economic performance.

level. Besides status, commoners also face a *social distance* cost associated with shedding an alternative identity, which is heterogeneous across commoners. In addition to its psychological salience, identity is also economically relevant. In the model, elites operate a formal economy, in which they provide public goods and collect taxes on the incomes of those commoners who identify with the nation. The income of commoners who adhere to the alternative identity, by contrast, is *contested* with elites, reflecting their resistance to the state. The contestation of such insecure income may range from outright war or violent revolt, to non-violent conflicts involving evasion or negotiation (see, for instance, Konrad & Qari, 2012), with efforts that are nonetheless costly and subtract from payoffs.

Solving the model, we show that elites have strong incentives to induce commoners to adopt a national identity. These benefits from national identification come from several distinct sources. First, conflict and its costs are reduced for elites. Second, the inclusion of more commoners in the formal economy increases the tax base. Third, the inclusion of more commoners in the formal economy facilitates the provision of public goods, both by (i) decreasing elites' marginal cost of public good investment and by (ii) increasing elites' return on investment.

At the same time, elites' incentives to induce national identification depend on the presence of *political restraints*. In the model, we consider the taxation and public goods decisions of elites both absent and in the presence of fiscal restraints—for example, through a legislature with veto powers (North & Weingast, 1989). In their absence, elites tax commoners in the formal economy excessively, appropriating some taxes for their own consumption. As a result, it is never incentive-compatible for commoners to identify nationally, conflict remains high, and public goods provision and national income low. In the presence of restraints, however, a fraction of commoners always chooses to identify with the nation, favoring public good investment and national income growth. This effect is self-reinforcing: by investing in productive public goods that boost the status of the nation, elites further increase the psychological benefits from national identification. Comparing these two cases, we show that introducing political restraints can in fact *improve* elites' welfare when resultant national identification will be strong. These findings generalize to allowing for direct investments in national status by elites for the purpose of heightening national identification. Overall, the model shows why national identification, public goods provision, and development may tend to coincide in modern states, relative to pre-modern ones.

In the final sections of the paper, we provide several pieces of evidence for the theory. First, we use our framework to shed new light on the political and economic development of England since the 17th century. This case evidence suggests a central role for national identity in building the modern English (subsequently, British) state. Second, we identify from country-level panel data a set of robust empirical correlations in line with the theory's main findings. Absent measures of national identification for countries, we construct a new time-varying index using machine learning. To do this, we first estimate the relative importance of a wide array of plausibly-relevant country-level predictors of individual national identification, using a large sample of respondents from the World Values Survey (WVS). Drawing from the vast prior literature on nation building, propaganda, and patriotism (Alesina & Spolaore, 2005; Sambanis *et al.*, 2015; Bazzi *et al.*, 2019; Alesina *et al.*, 2021), these country-level variables include those related to military conflict, institutional history, compulsory education, and social diversity, among others. As this set of variables is large, we then use a least absolute shrinkage and selection operator (LASSO) to identify an optimal set of country-level predictors of national identity and its dynamics for countries. Partialing out individual characteristics, this results in a parsimonious

set of country-level characteristics that best fit the variation in national identification in the WVS data. We then use this empirical model to construct an index of national identity for countries between 1981 and 2012, paired with time-varying data on economic performance, public finance, and internal conflict.

This paper makes several contributions to our understanding of nation building, state formation, and economic development. First, while previous research establishes the benefits of national identification for public goods provision (Konrad & Qari, 2012; Qari *et al.*, 2012) and internal conflict reduction (Alesina *et al.*, 2021),[3] our paper is unique in showing how elites may strategically use national identity as a tool for developing the distinct public finance of the modern state, for the mutual economic betterment of elites and the masses. This follows Testa (2018), who models strategic embedding of propaganda in educational content for the purposes of making the provision of public education—and resultant economic development—less politically costly for autocrats. Yet, unlike our paper, national identity plays no role in that model, wherein propaganda serves only to persuade citizens that elites' interests are aligned with their own, allowing elites to sustain an extractive policy over the medium run. Separately, our work complements Alesina *et al.* (2020), in which strategic nation building favors mass acquiescence to war. In contrast to that paper, we focus on the use of national identity for providing "productive" public goods (e.g., schools, highways), in pursuit of economic development and growth.

Second, our model provides a hitherto unseen application of social identity theory, building on a burgeoning theoretical literature across economics, political science, and social psychology wherein group membership is assumed to affect individual preferences and behavior (Akerlof & Kranton, 2000; Shayo, 2009). In particular, individuals may adopt group identities that favor in-group bias and facilitate cooperation with others also sharing in that identity. The composition of identities in a population may evolve over time in response to both material and psychological factors, with profound implications for conflict and collective action. Previous theoretical work has focused on a variety of ethnic, religious, regional, and class identity cleavages found within citizenries, as they relate to violent conflict (Sambanis & Shayo, 2013), support for redistribution (Holm, 2016; Lindqvist & Ostling, 2013; Shayo, 2009), and the rise of populist movements (Grossman & Helpman, 2020). This paper is unique in its application of this framework to the study of cleavages between the citizenry and the ruling elite, as well as the formation of common identities across these groups via the advent of nation-states. Most closely related is Saleh & Tirole (2021), who develop an identity-based framework in which rulers levy discriminatory taxes on alternative identifiers, inducing some to convert to the mainstream, with application to pre-modern Egypt. Our framework suggests a less chauvinistic path out of internal conflict available to modern states, in which national status and prestige stemming from broad-based public goods provision foster psychological *satisfaction*, facilitating a national identification.

Finally, the role of political institutions in our model in shaping the emergence of nation-states, particularly as it relates to the broadening of public goods provision, complements long-standing work in political economy on the two-way role of institutions and state capacity in giving rise to the modern, growth-promoting state. Our theory closely mirrors this existing literature along two key dimensions. First, political constraints in our model introduce credible commitment on the part of the elite, which proves key to inducing national identification among commoners and thereby increasing the tax base and public goods provided. While a prominent body of literature has established the role of the limited state

[3]Having a socially homogeneous population can reduce conflicts and favor support for and provision of public goods (Alesina *et al.*, 1999; Alesina & Spolaore, 2005). Common identification may also facilitate collaborative production in factories and offices (Gellner, 1983; Hjort, 2014).

in driving economic performance (see, for instance, Acemoglu *et al.*, 2005; North *et al.*, 2009), little emphasis has been placed on the intervening role of national identity and the nation-state in this process, as we do in this paper. Second, national identification and public goods provision mutually reinforce one another in promoting economic performance in our model, particularly in the presence of political constraints. This qualitatively recalls Besley & Persson (2011) on the coevolution of state capacity, public goods provision, internal peace, and high per capita incomes, with strong institutions serving to underpin these "clusters." We emphasize an additional, distinct dimension—national identity—as being central within this process of modern state development.

2 The Basic Framework

We now develop our core theoretical model. We incorporate agent heterogeneity along two main dimensions: (i) political power, the distribution of which is fixed, and (ii) group identity, which is endogenous to the agent. The main sources of income are private resources enhanced by public goods, with conflict over income arising from differences in identity. Besides the provision of public goods, the political environment includes taxation, which we consider both with and without fiscal restraints on the elite. We proceed to solve the model in Section 3, before considering key model robustness in Section 4.

2.1 Environment

In the model, the country has an *elite* of size $\beta \in (0, 1)$, with the rest of population's size, consisting of *commoners*, normalized to 1. Members of the elite share an identity, which coincides with the *national* identity. Commoners, meanwhile, may adhere to an *alternative* identity or may identify nationally if incentivized sufficiently to do so. We embed these ingredients in an overlapping-generations framework, with each generation lasting two periods, $t = 0, 1, ...$, and the size of each generation of elites and commoners assumed to be fixed across all periods. The share of commoners subscribing to the alternative identity α_t (with $1-\alpha_t$ being the share that identifies nationally), meanwhile, may evolve over time. For ease of exposition and without affecting our results, there is no discounting of the future across periods.

Note that we abstract from intra-elite conflict, which is not the focus of this paper—although the same conflict arising between commoners and elites in the model could, in principle, also take place *within* the elite, albeit at the expense of significant tractability. We likewise abstract from other potential heterogeneities in identification among commoners, such as having multiple alternative identities or multidimensional identities (Sen, 2006; Carvalho *et al.*, 2022a). Finally, we abstract from external players and the role of interstate wars in the building of modern states, not because we consider them unimportant but because others have emphasized this factor and, if anything, the inclusion of this factor would reinforce our results.[4] Instead, we allow for *internal* conflicts—specifically, those between commoners and elites, who are often distinguished in nascent states by social identity as well as power.

Indeed, nearly all early modern societies and states had social divisions enshrined in law or custom that our modeling approach could approximate. These may have been based, for instance, in class, ethnicity, or religion. The United Kingdom, for example, has historically had clear divisions between the

[4] Tilly (1990)'s well-known dictum "states made war and the war made the state" applied to early European states. Besley & Persson (2011) and Gennaioli & Voth (2015) examine theoretically and empirically the relationship between interstate wars and state capacity. Sambanis *et al.* (2015, 2020) and Alesina *et al.* (2020) examine the relationships of interstate conflicts and external interventions with national identification.

commoners and the aristocracy, with roots in Norman conquest and characterized thereafter by differences of both class and religion, as we argue in Section 5. The aristocracy, together with the emergent bourgeoisie,[5] would be approximated by the elite players in our model. In Latin America, meanwhile, one prominent cleavage historically has been between *criollos* of Iberian descent, on one hand, and Native Americans, Afro-Americans and those of mixed descent, on the other. In other contexts, language, region, or tribe might be the salient basis of social division between commoners and elites.[6]

Material Payoffs. The per-period material payoffs include several components, which depend on the choices of elites and commoners, as well as the latter's identity. The model consists of a formal economy, in which income depends on an ordinary infrastructural public good G provided by elites, together with the private resources of commoners and elites, with taxation τ determined by elites. The model also consists of an informal economy, in which income is contested between elites and the commoners adhering to the alternative identity. All public finance and conflict decisions are made so to maximize group-level welfare, while commoners' choice of group identity is taken at the individual level.

The pre-tax income of elites from ordinary economic activity in period t is $Y_{et} = G_t^{\gamma} R$ for some $R \geq 1$ where $\gamma \in (0, 1)$. We suppose that G_t has been inherited from the previous period and equals $(1-d)G_{t-1} + g_{t-1}$, where G_{t-1} is the stock of the public good from the previous period, $d \in (0, 1)$ is the depreciation rate, and g_{t-1} is the investment in the public good that was undertaken at the end of the previous period. New investment in the public good in the current period is represented by g_t, such that the next period's level of the public good is $G_{t+1} = (1-d)G_t + g_t$.

The income of commoners, meanwhile, depends on whether they identify with the nation or with the alternative identity. The pre-tax income of those who identify with the nation is simply $Y_{nct} = G_t^{\gamma}$, where any other, private resources are normalized to 1, such that the private resources of elites $R(\geq 1)$ represents the degree of inequality in the formal economy.

Distinct from those who identity with the nation, the income of commoners who adhere to the alternative identity is *contested* with elites, reflecting their resistance to the state. The contestation of such "insecure" income might range from outright war to imprisonment to wholly non-violent conflicts that involve evasion and negotiation, with efforts that are nonetheless costly and subtract from material payoffs. This is modeled by way of an informal economy, made up of total contested income of $A(T + \alpha_t)$, where α_t is the number of commoners that subscribe to the alternative identity in period t and T denotes rents from natural resources, smuggling, or other sources. A represents the (exogenous) level of some infrastructural public good with which insecure endowments are combined. As alternative identifiers are, by definition, in a state of conflict with elites, provision of this public good is presumably low (e.g., due to underinvestment by authorities) and fixed at a certain level (i.e., $A = \bar{G}^{\gamma}$ for some $\bar{G}$).

The share of contested income received by elites, who control the government, is $\frac{e_{nt}}{e_{nt}+e_{at}}$, whereas the share among the alternative identifiers is $\frac{e_{at}}{e_{at}+e_{nt}}$, where e_{nt} and e_{at} are the contest efforts of the two groups. Whereas the marginal cost of e_{at} is 1, the marginal (and average) cost of the government's effort e_{nt} is $c \in (0, 1)$. This reflects the government's capacity to suppress conflict and might reflect, among other things, accumulation of previous "capital" expenditures on organization, training, or fixed assets; the higher this type of "capital" is, the lower is the marginal cost c.[7]

[5] Piketty (2020) also includes the clergy as another "estate," which for our purposes we fold into the elite along with the nobility.
[6] The *Tutsi* and the *Hutu* mirror the dichotomy of our model for the case of Rwanda, for instance (Newbury, 1988).
[7] See Konrad (2009) for an overview of contest and conflict theory and Schaller & Skaperdas (2020) for modeling the reduction

Lastly, the elites set a tax rate $\tau_t \in [0,1]$, where tax revenues equal $\tau_t(\beta Y_{et} + (1-\alpha_t)Y_{nct})$.[8] Tax revenue is used to finance government expenditures. However, elites may also choose to appropriate part of the taxes collected; that is, elites could keep the difference between $\tau_t(\beta Y_{et} + (1-\alpha_t)Y_{nct})$ and g_t for their own consumption.

In sum, the respective per-period (and per-generation) group-level material payoffs of elites, commoners who identify nationally, and commoners who adhere to the alternative identity are as follows:

$$\begin{aligned} \pi^m_{et} &= \tau_t G_t^{\gamma}(\beta R + 1 - \alpha_t) - g_t + (1-\tau_t)G_t^{\gamma}\beta R \\ &\quad + \frac{e_{nt}}{e_{nt}+e_{at}} A(T+\alpha_t) - ce_{nt}, \qquad (1) \\ \pi^m_{nct} &= (1-\tau_t)G_t^{\gamma}(1-\alpha_t), \qquad (2) \\ \pi^m_{act} &= \frac{e_{at}}{e_{nt}+e_{at}} \phi A(T+\alpha_t) - e_{nt}. \qquad (3) \end{aligned}$$

The material payoff of elites in (1) consists of the tax revenue collected from all secure income, including from the commoners who identify with the nation ($\tau_t G_t^{\gamma}(\beta R + 1 - \alpha_t)$), minus the investment in the public good for the next period (g_t), plus their own net (after-tax) income ($(1-\tau_t)G_t^{\gamma}\beta R$), plus their share of insecure income ($\frac{e_{nt}}{e_{nt}+e_{at}} A(T+\alpha_t)$), minus the cost of capturing that insecure income (ce_{nt}).

The material payoff of commoners who identify with the nation in (2) is simply their after-tax secure income.[9] The material payoff of alternative identifiers in (3) includes their share of insecure income, possibly reduced due to problems of collective organization as indicated by the parameter $\phi \in (0,1]$, minus the cost of effort e_{nt}. The lower is ϕ, the less is their collective organization and we can expect, in equilibrium, lower payoffs among alternative identifiers. The degree of collective organization of alternative identities has of course been important historically in determining both resistance to nation building and the political incorporation of marginalized populations.

Psychological Payoffs. In addition to ordinary material payoffs, the two groups have *psychological payoffs*, which vary with the identity they espouse. The inclusion of such psychological payoffs is based on long-standing research in social identity theory, including a nascent literature in economics on identity, as well as a vast literature on the nation-state.[10]

First, all members of the population have *status* payoffs. We define group status similarly, albeit in simplified fashion, to Sambanis & Shayo (2013), in which group status depends in part on the material achievements of the in-group. For instance, having a country with high levels of growth, that builds high-speed railways, or that goes to the Moon all confers prestige and status to the nation, bringing psychological satisfaction to individual citizens who identify with the nation. Here, the national status in period t and the per-period status payoff from identifying with the nation are equivalently defined as:

$$\pi^s_{nt} = \sigma \pi^m_{nt} + \sigma_n, \qquad (4)$$

in c as an increase in up-front investments.

[8] We could allow for different tax rates for elites and commoner but, because we allow for elites to consume themselves the tax revenue, the qualitative results would be similar.

[9] Note that for the choice of identity, it will be individual payoffs that matter for the commoners. For example, for those who choose to identify with the nation, we need to divide the payoff in (2) by the size of the group, which is $1-\alpha_t$ in this case.

[10] For social identity theory, see Tajfel & Turner (1986). Anderson (1983) and Gellner (1983) are early seminal contributions to the literature on the nation-state and nationalism. Akerlof & Kranton (2000) provides a modeling approach to identity, and Sen (2006) examines the role of identity in relation to conflict. Our own approach to modeling identity has similarities to that of Sambanis & Shayo (2013) as well as Sambanis *et al.* (2015, 2020).

where $\sigma > 0$ and π^m_{nt} is a measure of the country's material income, which corresponds to the country's secure income in our model. Of course, national status payoffs are not *only* dependent on one's own nation's income level. σ_n serves as a summary parameter, which includes other exogenous variables that affect the country's reputation, such as the material payoffs of other countries.[11]

The group status and associated payoffs of alternative-identity commoners similarly depend on the material achievements of that group. Alternative identifiers' per-period status payoff is:

$$\pi^s_{at} = \sigma_a \pi^m_{act}, \tag{5}$$

where $\sigma_a > 0$ and π^m_{ac} is the material payoff of alternative identifiers. To conserve notation, we set the payoff analogous to σ_n for alternative identifiers to 0; the σ_n parameter in (4) is thus relative to the alternative identity. We could also have allowed agents to have comparison status payoffs involving other competing identities (e.g., other nations), but at significant computational expense without changing our qualitative results.

Second, commoners who identify with the nation have a *social distance* or alienation payoff $\pi^d_{nct} = -\delta$ where δ is distributed over the interval $[0, \Delta]$ according to a continuous cumulative distribution $F(\delta)$. In contrast, commoners who adhere to the alternative identity do not have to suffer from any such cognitive dissonance in their identification and have a 0 distance payoff.[12] Likewise, the distance payoffs of elites, given that they control the nature of national identity, are assumed to be 0.

Together, the per-period payoffs are the sum of all material, status, and distance payoffs of each side. Based on all of the above, the group-level payoff of the elites is:

$$\pi_{et} = \pi^m_{et} + \pi^s_{nt} = \pi^m_{et} + \sigma\pi^m_{nt} + \sigma_n = \pi^m_{et} + \sigma(\pi^m_{et} + \pi^m_{nct}) + \sigma_n.$$

Similarly, the group-level payoff of the commoners who identify with the nation is:

$$\pi_{nct} = \pi^m_{nct} + \sigma(\pi^m_{et} + \pi^m_{nct}) + \sigma_n - \delta,$$

and the group-level payoff of the commoners with the alternative identity is:

$$\pi_{act} = \pi^m_{act}(1 + \sigma_a),$$

where individual payoffs are the group-level payoffs divided by the population size of each type.

2.2 Timing

In each period t, we consider the following sequence of moves:

1. Individual commoners of each generation make the choice between identifying with the nation (n)

[11] (Greenfeld, 2001, 138-9), for instance, writes: "The moment the French (that is, the French elite, or public) began thinking of themselves as members of a nation—the moment, in other words, they acquired a national identity—their eyes were focused on England; they had to compare themselves to it and try to become like it." Greenfeld considers the adoption of nationalism to be the primary source of modern economic growth, the true "spirit of capitalism". As a counterexample of a country that initially had high economic growth yet failed to become a "nation" and then entered a period of economic decline is the Dutch Republic, which saw extraordinary growth up to about 1650 but then declined for more than a century.

[12] The perceived distance can also depend on the degree of conflict between the two identities (see Sambanis *et al.*, 2020) for particular cases and modeling), but the essence of our results would not be affected by such enhancements of the model.

or with the alternative identity (a), where $\alpha_t \in [0,1]$ denotes the proportion choosing the latter.

2. Production of secure income takes place; elites and alternative identifiers each collectively make costly conflict efforts (e_{nt} and e_{at}), which result in the distribution of insecure income.

3. Given identities from stage 1 and total material incomes from stage 2, the young generation of elites collectively chooses:

   a. The tax rate $\tau_t \in [0,1]$ on all secure income.

   b. Investment in the public good (g_t) for the next period, where the cost of g_t cannot exceed the tax revenue, $g_t \leq \tau_t G_t^{\gamma}(\beta R + 1 - \alpha_t)$.

Note that the "choice" of identity in stage 1, as with all other choices made in economic decision-making, may not represent an altogether conscious decision. It may certainly involve psychological transformation, orienting preferences toward elite imitation or what is perceived to be mainstream. Yet, it may also correspond to more explicit choices that involve accepting or tacitly acquiescing to the government's legitimacy. For example, registering land with the government, using the country's court system (instead of customary or informal justice systems of a village, tribe, or favela), or enrolling your children in a public school may all be ways of "identifying with the nation." Likewise, the choice to remain "unregistered" or avoid official interaction or transaction with state authorities—all loci of alternative identities (see Carvalho *et al.*, 2022b)—was common in 19th century Europe and remains so in many places today.

3 Solving the Model

We proceed now to solving the model. We first examine the conflict between the elites and the alternative identifiers for insecure income in stage 2 for any given choice of identities α_t by the commoners. We do so because, as we shall see, it ultimately has no effect on the choices in stage 3. For notational convenience, we temporarily drop the subscript t from all variables (i.e., α_t we will simply denote by α). As indicated above, the incomes that emerge from this conflict are separable from secure incomes.

Using I to denote "insecure" income, the relevant parts of the payoffs for the two sides are then the following:

$$\pi_e^I(e_n, e_a) = \frac{e_n}{e_n + e_a} A(T + \alpha) - c e_n, \tag{6}$$

$$\pi_{ac}^I(e_n, e_a) = (1 + \sigma_a)[\frac{e_a}{e_n + e_a} \phi A(T + \alpha) - e_n].$$

In the Appendix, we show that the equilibrium shares received by each side, which depend on the equilibrium efforts e_n^* and e_a^*, are:

$$p^* \equiv \frac{e_n^*}{e_n^* + e_a^*} = \frac{1}{1 + c\phi} \text{ with } 1 - p^* = \frac{c\phi}{1 + c\phi}, \tag{7}$$

and the equilibrium payoffs are:

$$\begin{aligned} \pi_e^I(e_n^*, e_a^*) &= p^{*2} A(T + \alpha), \\ \pi_{ac}^I(e_n^*, e_a^*) &= (1 - p^*)^2 \phi A(T + \alpha)(1 + \sigma_a). \end{aligned} \tag{8}$$

Note that relative "power" of elites, as indicated by p^* in (7) is determined by the elites' marginal cost of suppression (c) and the degree of the alternative identifiers' collective organization (ϕ). The lower is the marginal cost of suppression and the lower is the degree of collective organization, the higher is the elites' power and the lower is that of the alternative identifiers. We summarize the main comparative statics of the equilibrium payoffs in Proposition 1.

Proposition 1: *There is a unique equilibrium in determining insecure incomes with the following properties:*

(i) *Both the elites' and the alternative identifiers' equilibrium insecure payoffs are increasing in the number of those who adhere to the alternative identity* (α), *in the level of rents* (T), *and in the fixed level of the infrastructural public good in the informal economy,* $A(=\bar{G}^{\gamma})$.

(ii) *The elites' equilibrium insecure payoff is decreasing in the elites' cost of suppression* (c) *and in the degree of collective organization of the alternative identifiers* (ϕ).

(iii) *The equilibrium payoff of the alternative identifiers is increasing in the elites' cost of suppression* (c), *as well as the degree of collective organization* (ϕ) *and status* (σ_a) *of the alternative identity.*

These insecure payoffs are a source of income for elites, and, other things being equal, they would like to increase them. However, the sources of this income are outside the formal economy, and there are several costs associated with them. First, each side must expend costly effortsin order to secure a share of the insecure income. That is reflected in the fact that, in equilibrium, elites receive a "net" p^{*2} share of the insecure income instead of the "gross" share $p^*(< p^{*2})$ (see equations 8).[13] Second, having a larger fraction of alternative identifiers (α) who, as such, are in conflict with the elites has the effect of reducing the tax base in the formal economy for providing the formal public good. The latter also comes at the expense of various positive externalities, as we later show in Section 3.2.

3.1 Elite Maximization in the Absence of Fiscal Restraints

We next consider the choices made by the elites in stage 3, which determine the tax rate τ_t for the current period's secure income as well as the investment g_t in the next period's level of the public good. We begin by assuming away any fiscal restraints on the elites' ability to freely expropriate all incomes of commoners that formally identity with the nation.

Let C denote the payoffs that are directly exogenous to the public good decision. These include the insecure income payoffs for the two periods just derived in (8) and the fixed relative status payoff (σ_n) for each period.[14] Then, the problem of the elites of generation t is:

$$\max_{\tau_t, g_t} \pi_e^t = (\tau_t + \sigma)G_t^{\gamma}(\beta R + (1-\alpha_t)) - g_t + (1-\tau_t)G_t^{\gamma}\beta R \qquad (9)$$
$$+(\tau_{t+1} + \sigma)G_{t+1}^{\gamma}(\beta R + (1-\alpha_{t+1})) - g_{t+1} + (1-\tau_{t+1})G_{t+1}^{\gamma}\beta R + C.$$

The first term $(\tau_t + \sigma)G_t^{\gamma}(\beta R + (1-\alpha_t))$ represents the current period's tax revenue plus the variable status payoff. The latter is increasing in the national status via the parameter σ, and it also includes the

[13] In addition, insofar as the level of the informal public good (A) can be expected to be lower than in the formal modern part of the economy, the marginal *benefit* of informal endowments would be lower than those in the formal economy.

[14] Taking into account the conflict payoffs described above, $C = p^{*2}A[T + \alpha_t] + 2\beta R\sigma_n$.

material income of the commoners who identify with the nation, offering some intuition for why elites might prefer to heighten national identification. Finally, the term $(1-\tau_t)\beta G_t^{\gamma}\beta R$ is the current period's after-tax elite secure income. The terms for the next period $t+1$ have equivalent interpretations. Elites also face the current period's budget constraint:

$$g_t \leq \tau_t G_t^{\gamma}(\beta R + (1-\alpha_t)), \tag{10}$$

However, note that the terms in (9) that involve the current tax rate τ_t simplify to:

$$(\tau_t + \sigma)G_t^{\gamma}(1-\alpha_t) + (1+\sigma)\beta G_t^{\gamma}\beta R.$$

This implies that for $\alpha_t < 1$, the optimal tax rate is to impose the maximal tax rate of 100%, or $\tau_t^* = 1$. This is because all taxes in excess of those expended on the public good revert back to elites as a transfer. That implies that any national identifiers would be completely expropriated and their material payoff would be 0. Given this, we could not reasonably expect their total payoff, now just $\sigma_n - \delta$, to be higher than that of the alternative identifiers. Therefore, in the absence of any restraint we always have $\alpha_t^* = 1$ for all t in any subgame perfect equilibrium.

Since the elites in that case will be taxing themselves to invest in the public good, the constraint in (10) is binding, and given $\alpha_t = \alpha_{t+1} = 1$ and $G_{t+1} = g_t + (1-d)G_t$, the relevant part of the elites' payoff that is maximized by the choice of g_t is:

$$(1+\sigma)(g_t + (1-d)G_t)^{\gamma}\beta R - g_t,$$

subject to $g_t \leq G_t^{\gamma}\beta R$.

The optimal choice of investment in the public good can then be shown to be:

$$g_t^e = \left\{ \begin{array}{c} G_t^{\gamma}\beta R \text{ if } G_e \in [(1-d)G_t + G_t^{\gamma}\beta R, \infty) \\ dG_t + G_e - G_t \text{ if } G_e \in [(1-d)G_t, (1-d)G_t + G_t^{\gamma}\beta R] \\ 0 \text{ if } G_e \in (0, (1-d)G_t] \end{array} \right\},$$

where:

$$G_e \equiv [\gamma(1+\sigma)\beta R]^{\frac{1}{1-\gamma}}. \tag{11}$$

In other words, when the pre-determined level of the public good (G_t) along with the existing taxable income of elites ($G_t^{\gamma}\beta R$) are low enough, all taxable income is used to invest in the public good. At higher levels of the public good and taxable income, the investment in the public good is such that next period's public good is $G_{t+1}^e = g_t^e + (1-d)G_t = G_e$. When the pre-determined level of the public good is high enough, there is zero investment until the level of public good settles at G_e.

That is, G_e is also the *steady state* level of the public good that elites would converge to almost immediately, initial resources permitting. The steady state optimal level of investment and the implied tax rate would then be:

$$g_e = d[\gamma(1+\sigma)\beta R]^{\frac{1}{1-\gamma}} \text{ and } \tau_e = d\gamma(1+\sigma) \leq 1. \tag{12}$$

Finally, the maximal steady state elite payoff over the two periods in this case can be shown to be the

following:

$$\pi_e^e = 2[\gamma(1+\sigma)]^{\frac{\gamma}{1-\gamma}}\beta R^{\frac{1}{1-\gamma}}(1-d\gamma)(1+\sigma)+C. \tag{13}$$

We summarize the main results thus far in Proposition 2.

Proposition 2: *In the absence of restraints on elite maximization, elites cannot commit to not expropriate the commoners, including those who would otherwise identify with the nation; therefore, no commoners identify with the nation. The public good G_e provided in steady state and the payoff of the elites π_e^e are increasing in the national status (σ).*

Note that, even in this case of a completely elite-driven state, public goods provision is complementary to the perceived status associated with national identification. This complementarity is a central theme that we continue to explore throughout the rest of the paper. That being said, the conditions approximated here are closer to those of a successful pre-modern state that could potentially evolve into a modern state, rather than the modern states on which we will eventually focus. The "successful" part of this characterization comes primarily from our assumption of a unified elite; in the presence of a divided elite—such as France immediately before the Revolution—the incentives to invest in public goods would be naturally lower than in the absence of elite divisions. England after the Glorious Revolution—which despite the persistent squabbling among its political and economic elite during much of the 18th century was much closer in achieving common objectives—better approximates our conditions. We explore the case of England in greater detail in Section 5.

3.2 Elite Maximization in the Presence of Fiscal Restraints

We follow Acemoglu & Robinson (2000) and now suppose that elites can commit to spend all the taxes to fund the public good instead of appropriating part of them for their own benefit. Such commitment is usually difficult to accomplish without some form of checks and balances, such as in the presence of legislatures, courts, or other institutions independent of the executive. One way that commoners might enforce such a commitment, for instance, would be to control a legislative chamber with the power to veto legislation that violates such a commitment (North & Weingast, 1989). Regardless of the particulars of the commitment mechanism, we will show that it may be to the long-term betterment of elites to be constrained by it. In that regard, our approach is similar to Acemoglu & Robinson (2000) and Lizzeri & Persico (2004), wherein elites are assumed to commit to greater redistribution or public good provision whenever payoffs are greater from extending the franchise. As in those papers, this could equivalently be made a first stage of each period t in our model.

In the presence of such a commitment device, the constraint in (10) is binding, such that tax rates and public goods are related as follows:

$$\tau_t = \frac{g_t}{(g_{t-1}+(1-d)G_{t-1})^{\gamma}(\beta R+(1-\alpha))}, \tag{14}$$

where the total tax paid by elites is $\tau_t(g_{t-1}+(1-d)G_{t-1})^{\gamma}\beta R = \frac{g_t(g_{t-1}+(1-d)G_{t-1})^{\gamma}\beta R}{(g_{t-1}+(1-d)G_{t-1})^{\gamma}(\beta R+(1-\alpha))} = \frac{g_t\beta R}{\beta R+1-\alpha}$. That is, when some commoners identify with the nation, the elites pay only the share $\frac{\beta R}{\beta R+1-\alpha}$ of the investment in the public good, with a higher fraction of the commoners identifying with the nation

reducing that share, and thus reducing the marginal cost of the public good to the elites.

On the Choice Between National and Alternative Identification. Before examining the fiscal choices made by the elites, we must determine the response by the commoners in stage 1 to the anticipated fiscal choices of the elites in stage 3. In each period t, the commoners make a choice between the alternative identity and the national identity. In doing so, each commoner compares the payoffs, both material and psychological, under the two identities. As such, the equilibrium payoff of the alternative identifiers (with the portion under contestation divided by α to allow for individual payoffs) is compared in stage 1 to the expected payoff of a commoner identifying with the nation. Recall that the population of commoners is differentiated by the size of the distance payoff δ associated with national identification. Hence, if there were to be a nonzero share of the population identifying with each group, those with low enough δ would identify with the nation and those with high enough δ would adhere to the alternative identity. Given that the cumulative distribution function $F(\delta)$ is continuous, there exists a cutoff $\bar{\delta}$ which determines who identifies with the nation (i.e., those below $\bar{\delta}$) and who with the alternative identity (i.e., those above $\bar{\delta}$), such that $\bar{\alpha} = 1 - F(\bar{\delta})$. In the Appendix, we show that unique critical values of $\bar{\alpha}$ *and* $\bar{\delta}$ exist under mild conditions. These are important in determining the choices made by the elites. How different variables affect $\bar{\alpha}$ and $\bar{\delta}$ is described next.

Proposition 3: *For sufficiently positive* σ or σ_a *the share of commoners who retain the alternative identity* $\bar{\alpha}$ *is*:

(i) *decreasing in the national status* (σ);

(ii) *increasing in the level of rents* (T), *in the elites' cost of suppression* (c), *and in both the degree of collective organization* (ϕ) *and status* (σ_a) *of the alternative identity*;

(iii) *a differentiable function of* g *and* g_- *such that* $\frac{\partial \bar{\alpha}}{\partial g} > 0$ $\frac{\partial \bar{\alpha}}{\partial g_-} < 0$.

Proof. See Appendix. □

Perhaps somewhat surprising in part (iii) is that current investment in the public good (g) initially increases the number of alternative identifiers ($\frac{\partial \bar{\alpha}}{\partial g} > 0$). The reason for this result is that an increase in g increases taxation in the current period, thus reducing the income of national identifiers in the current period, thereby making national identification temporarily less attractive. However, an increase in g ultimately increases the size of the public good, and therefore national income, in the *next* period, when it in turn has a positive effect on national identification. This effect is shown in the final comparative static, using the previous period's investment, g_-, where $\frac{\partial \bar{\alpha}}{\partial g_-} < 0$.

The other effects on the share of alternative identifiers are monotonic and intuitively plausible. A large national status parameter σ further encourages identification with the nation, thus reducing the share of alternative identifiers. Meanwhile, higher collective organization of alternative identifiers (ϕ), a higher cost of suppression (c), and a higher status of the alternative identity all increase the payoffs of alternative identifiers and, therefore, their number.

Fiscal Choices. Now adopting the constraint (14) and taking into account the effect that fiscal choices

have on the number of commoners who identify nationally, the elites' problem becomes the following:[15]

$$\begin{aligned}\max_{g_t} \tilde{\pi}_e^t &= G_t{}^{\gamma}[\beta R + \sigma(\beta R + 1 - \bar{\alpha}_t)] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_t) - \frac{\beta R}{\beta R + 1 - \bar{\alpha}_t} g_t \\ &+ G_{t+1}{}^{\gamma}[\beta R + \sigma(\beta R + 1 - \bar{\alpha}_{t+1})] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_{t+1}] - \frac{\beta R}{\beta R + 1 - \bar{a}_{t+1}} g_{t+1}.\end{aligned} \tag{15}$$

The first three terms are the elements of the elites' payoff in period t, while the rest correspond to period $t+1$. The choice of investment in the public good g_t affects both the current period's cutoff level of commoner identity ($\bar{a}_t$) as well as next period's ($\bar{a}_{t+1}$). Since the level of the public good G_t is inherited from the past, the first two terms can be influenced through $\bar{a}_t$ only, by increasing the number of commoners who become national identifiers. The third term is the cost of taxation to elites in period t in the presence of political restraints. The fourth term is the $t+1$ payoff, which includes the investment in the public good at period t. The same term includes the share of alternative identifiers in $t+1$, $\bar{a}_{t+1}$, which depends on the choice of public good investment g_{t+1} by the next generation elite and is not under the current maximizer's control. However, $\bar{a}_{t+1}$ also depends on g_t (since $G_{t+1} = g_t + (1-d)G_t$). The fifth and sixth terms also depend on g_t, indirectly through its effect on $\bar{a}_{t+1}$.

In other words, deriving the optimal choice of public good investment is non-trivial in the presence of fiscal restraints. We define the steady state level of investment g^* and the associated level of public good G^*, such that $g^* = dG^*$, the one that maximizes (15) by setting $G_t = G^*$ and $\bar{\alpha}_{t+1} = \bar{\alpha}_{t+1} = \bar{a}(g^*) \equiv \bar{\alpha}^*$. Under intuitively plausible conditions,[16] the steady state level of public good provided is:

$$G^* = \left[\gamma\left(1 + \sigma + \sigma\zeta\right)\left(\beta R + 1 - \bar{\alpha}^*\right)\right]^{\frac{1}{1-\gamma}}, \tag{16}$$

for some $\zeta \in [\min\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}, \max\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}]$. We summarize the fiscal choices and some of its implications in the presence of political restraints in Proposition 4. Both the analysis of the incentives for investing at such levels and the proof of the Proposition are found in the Appendix.

Proposition 4: *Consider elite maximization in the presence of fiscal restraints, such that taxes solely finance public good investment. When national status (σ) or total elite resources (βR) are high enough or the marginal return on insecure income by the elites ($\frac{A}{(1-c\phi)^2}$) is low enough,*

(i) *The steady state level of public good is G^* in (16), where $G^* > G_e$, the steady state level of public good in the absence of restraints in (11);*

(ii) *The steady state payoff of the elites $\tilde{\pi}_e^*$ is higher than π_e^e, the payoff in the absence of fiscal restraints;*

(iii) *A positive number of commoners $1 - \bar{\alpha}^*$ identify with the nation. That number is increasing in national status (σ) and is decreasing in the value of rents (T), in the elites' cost of suppression (c), and in both the degree of collective organization (ϕ) and status (σ_a) of the alternative identity.*

Proof. See Appendix. □

[15] We do not include the fixed status payoff for the two periods ($2\sigma_n\beta R$) as it does not affect the choices made.

[16] The condition is that, in equilibrium the following inequality must be satisfied: $\sigma G^{*\gamma} + \frac{\beta R}{(\beta R + 1 - \bar{\alpha})^2} g^* > \frac{A}{(1+c\phi)^2}$ The inequality holds for sufficiently high σ or βR and sufficiently low marginal returns to insecure income ($\frac{A}{(1+c\phi)^2}$).

Investment in the public good is higher than it is in the absence of political restraints both because there are commoners who contribute to the public good—such that the marginal tax burden is lower for the elites than it otherwise would be—and because the additional income that the commoners bring increases the psychological payoff of the elites, generating additional incentive to invest. These two effects can be seen by decomposing the ratio of G^* to G_e in the following fashion:

$$\frac{G^*}{G_e} = \left(\frac{1+\sigma+\sigma\zeta}{1+\sigma}\right)^{\frac{1}{1-\gamma}} \left(\frac{\beta R+1-\bar{\alpha}^*}{\beta R}\right)^{\frac{1}{1-\gamma}}.$$

The first ratio contains the additional term $\sigma\zeta$ in the numerator, which reflects the added public good resulting from of the inclusion of commoners in the formal economy. The second ratio reflects the added tax benefit of having the commoners who identify with the nation pay part of the tax bill of the public good. The more of these commoners there are, the higher is this marginal tax benefit to the elites relative to the case without fiscal restraints. The resultant tax rate is higher than the one in the absence of political restraints (12) but only by the term $\sigma\zeta$:

$$\tau^* = d\gamma(1+\sigma+\sigma\zeta) \leq 1.$$

Although the public good is provided at a considerably higher rate in the presence of political restraints, this not always to the net benefit of the elites. Recall that another source of income among elites comes from the informal economy, in which incomes are insecure and have to be earned through conflictual efforts (see (8)). High enough perceived national status (σ) or low enough marginal returns on insecure income ($\frac{A}{(1-c\phi)^2}$) are needed. Otherwise, the combination of higher material payoffs and higher psychological payoffs resulting from a higher level of the public good would not be sufficient to compensate for the lost insecure income from commoners coming to identify with the nation. Perhaps ironically, a strong repressive capacity by the elites (low c) and a low ability among commoners to collectively organize (low ϕ) would prevent the elites from incorporating more commoners, as it would be too profitable to keep things as they are. Overall, sufficiently low national status or high insecure incomes among the elites could keep them from preferring the political restraints needed to induce commitment not to extort the commoners, thus preventing commoners from identifying with the nation, ensuring that internal conflict persists, and keeping the level of the public good relatively low.

Indeed, the incorporation of commoners into the nation is a key factor in expanding public goods provision and increasing incomes. We have shown that introducing credible commitment not to extort those who do identify with the nation is one mechanism facilitating such incorporation. Other, complementary factors that affect the degree to which this incorporation takes place include the relative statuses of the two identities (σ and σ_n versus σ_a), a lower degree of collective organization of the alternative identity (ϕ), and a higher capacity by the state to repress and fight against the alternative identifiers (c).

4 Investing in National Identity

Thus far, all of the variables associated with identity in our model have been exogenous to direct elite influence. This section relaxes this abstraction. Indeed, although many aspects of national identities are set by deeply historical factors—such as language, ethnic boundaries, and pre-existing states (Bockstette *et al.*, 2002; Spolaore & Wacziarg, 2013)—they are also continually shaped by current events, including

the direct efforts of elites in government and civil society. We outline several examples here.

First, given a place's history, there is a range of focal points around which new, shared identities can be constructed. Nineteenth and twentieth century European states tended to build national identities around a single language and ethnicity. Latin American states—founded in opposition to Iberian dominance—appeared to be more inclusive in their conception of their own nationhood, at least in principle if not in practice (Anderson, 1983). More homogeneous countries (e.g., Japan, South Korea) tend to emphasize language and ethnicity as part of their core identity. Other countries with many ethnicities and languages (e.g., Canada, India) often need to foster highly-inclusive conceptions of national identity.

Second, various exogenous and endogenous "shocks" frequently change the salience of national identity, if not its content. Wars often have profound effects on the importance and nature of national identity (Sambanis *et al.*, 2015; Alesina *et al.*, 2020). External influences—subsidies, trade agreements, proxy wars—can also have similar effects (Sambanis *et al.*, 2020). Even international sports events, such as successes of national soccer teams, can make substantial differences in how national identity is perceived versus sub-national identities (Depetris-Chauvin *et al.*, 2020).

Third, states make numerous various "investments" in order to heighten national identity. From flags and national anthems, to public schooling, to national soccer and Olympic teams, to expenditures in media at home and abroad, states often attempt to elevate national status in their citizens' minds.

In this extension, we focus on such "investments in national identity," which in the context of the model involve increasing the national status parameter σ.[17] Let S_t denote the accumulated capital on national status up to the previous period which has depreciated by $d \in (0,1)$. Letting s_t denote the period t investment in national identity, the accumulated capital in the next period becomes

$$S_{t+1} = s_t + (1-d)S_t,$$

where

$$\sigma_{t+1} = \psi(s_t + (1-d)S_t)^{\chi} \text{ where } \psi > 0 \text{ and } \chi \in (0,1). \tag{17}$$

As earlier, in each period t, we consider the following sequence of moves:

1. Individual commoners of each generation make the choice between identifying with the nation (n) or with the alternative identity (a) at the proportion $\alpha_t \in [0,1]$.

2. Production of secure income takes place; the elites and alternative identity commoners make costly conflict efforts (e_{nt} and e_{at}), which result in the distribution of insecure income.

3. Given identities from stage 1 and total material incomes from stage 2, the young elites choose:

   a. The tax rate $\tau_t \in [0,1]$ on all secure income.

   b. Investment in the public good (g_t) and in national identity (s_t) for the next period, where the cost of g_t and s_t cannot exceed the tax revenue, $g_t + s_t \leq \tau_t G_t^{\gamma}(\beta R + 1 - \alpha_t)$.

[17] Other possibilities for investing in national identity might include an increase in σ_n or a decrease in the distance that alternative identifiers might feel toward the national identity through decreases of δ. Note that these two types of investments would be equivalent to one another, as both enter the elites' and the commoners' payoffs linearly. Such investments would have more straightforward (and for that reason perhaps not as interesting) effects since they would not lead to the complementarities with investments in G that we find in the case of investments in σ.

We consider the case with fiscal restraints,[18] such that $g_t + s_t = \tau_t G_t^{\gamma}(\beta R + 1 - \alpha_t))$ and the elites' problem becomes:

$$\max_{g_t, s_t} \tilde{\pi}_e^t = G_t{}^{\gamma}[\beta R + \psi S_t{}^{\chi}(\beta R + 1 - \bar{\alpha}_t)] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_t) - \frac{\beta R}{\beta R + 1 - \bar{\alpha}_t}(g_t + s_t) \tag{18}$$
$$+ G_{t+1}{}^{\gamma}[\beta R + \psi S_{t+1}{}^{\chi}(\beta R + 1 - \bar{\alpha}_{t+1})] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_{t+1}] - \frac{\beta R}{\beta R + 1 - \bar{a}_{t+1}}(g_{t+1} + s_{t+1}).$$

We analyze this problem of the elites in the Appendix, where we also prove the following Proposition:

Proposition 5: *Consider elite maximization in the presence of sufficient political restraints, such that taxes are invested solely in the public good and in national identity. Suppose the marginal return on insecure income by the elites* $(\frac{A}{(1-c\phi)^2})$ *is sufficiently low. Then:*

(i) *The steady state levels of public good* $\hat{G}$ *and of investments in national identity* $\hat{S}$ *can be obtained from the following:*

$$\hat{G} = [\gamma \left(1 + \psi \hat{S}^{\chi}(1 + \eta)\right)(\beta R + 1 - \bar{\alpha})]^{\frac{1}{1-\gamma}},$$
$$\hat{S} = [\chi \psi \hat{G}^{\gamma} \theta (\beta R + 1 - \bar{\alpha})^2]^{\frac{1}{1-\chi}},$$

for some $\eta \in [\min\{\frac{1-\bar{\alpha}}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}, \max\{\frac{1-\bar{\alpha}}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}]$ and $\theta \in [\min\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}, \max\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}]$.

(ii) *A positive number of commoners* $1 - \bar{\alpha}$ *identify with the nation. That number is increasing in the relative status parameter* σ_n*; and decreasing in the value of rents* (T)*, the elites' cost of suppression* (c)*, and the collective organization* (ϕ) *and status* (σ_a) *of the alternative identity.*

Proof. See Appendix. □

In other words, provided the elites' marginal return on insecure income is low enough, there are steady state levels of public good and investment in national identity that are complementary to one another. That is, the steady state quantities in Proposition 5(i) indicate a higher steady state level of investment in national identity increases the steady state level of the public good, and vice versa.[19] Thus, the status payoffs associated with national identification and public goods provision mutually reinforce one another in promoting economic performance, in a qualitatively similar fashion to Besley & Persson (2011) regarding state capacity and public goods provision.

The payoffs of commoners identifying with the nation are of course also increasing both in the level of public good and in the national status, as is their number. Furthermore, as shown in Proposition 5(ii), the number of commoners who identify with the nation is affected by the relative status of the alternative identity, as well as the factors that affect the insecure payoffs of the alternative identifiers: their collective organization, the repressive capacity of the state, and the rents that are contested.

[18] Clearly, the same commitment problem as above of not expropriating national identifying commoners would surface in the present case as well, where the incentives to invest in national identity would be lower without commitment via restraints.

[19] This complementarity can also be seen in the first-order conditions (26) in the Appendix whereby an increase in S increases the marginal returns on g and an increase in G increases the marginal return on s.

A Modern Politico-Economic "Bundle." The complementarities we document thus far across national identification and public goods provision—together with internal peace, high per capita incomes, and liberal political institutions—can be conceived as part of a politico-economic "bundle" that tends to characterize states throughout the modern world.[20] Although we do not push this interpretation too far, our framework suggests a central role for national identities—arguably only made possible after the advent of centralized education and print media—in the coalescence of these attributes in modern states, which superseded "Big God" religions and the divine right of kings as the key driving social forces underpinning the structures of political and economic organization in many pre-modern states (Skaperdas & Vaidya, 2020). In the next section, we apply our framework to the case of England, which provided one of the first examples of this politico-economic bundle.

5 The Case of England, 1600–1920

In this section, we provide qualitative evidence for the central role of national identity in the political and economic development of modern England, from 1600 to 1920, consistent with our theory. Arguably one of the originators of the modern state, England has also sometimes been characterized as the first "nation" in the modern sense (Greenfeld, 2001). Formed over hundreds of years through the consolidation of several tiny kingdoms and shaped by Roman and Norman conquest, a form of English national identity first began to emerge in the 16th and 17th centuries (Williams, 1972; Elton, 1992; Greenfeld, 1992). Absent significant checks on the monarchy, however, national membership remained exclusive to a narrow elite (Kumar, 2003).

An Early English Nation-State, 1600–1700. In the early 17th century, the English Crown was insolvent and frequently engaged in arbitrary wealth expropriation, at the expense of England's economic performance (North & Weingast, 1989). At the heart of this was a distribution of political rights that allowed the Crown to redefine Parliament's powers at any time. However, the controversies surrounding James II's Catholicism as well as his suspension of Parliament in 1685 finally culminated in the Glorious Revolution in 1688. This resulted in a Bill of Rights, which restricted the Crown's confiscatory power, extending new rights to Parliament, while also formally limiting the Crown's power to later redefine those rights. For the Crown, this established credible commitment, which North & Weingast (1989) famously argue allowed renewed public expenditure ($\uparrow G$) and aided England's marked development ($\uparrow \pi^m_{nt}$) over the subsequent two centuries (for further discussion, see Dimitruk, 2022).

Implicit as a key mechanism in this process, however, was also the unification of the Crown and the Parliamentary "commoners" (i.e., wealthy landowners) behind a narrowly-Protestant English nationalism, which helped to ensure a reduction in conflict between them going forward ($\downarrow \alpha$). In support of this interpretation, Greif & Rubin (2023) argue that the Crown began to shift toward deriving its legitimacy popularly, through cooperation with Parliament, in the period following the Reformation. Likewise, historian Liah Greenfeld (1992, 31-5) describes how "national sovereignty came to be understood not simply as the sovereign power of the king but increasingly as that of the people" during this time.

The Rise of the Middle Class Englishman, 1700–1830. Other extensions of political rights would later follow. In the meantime, many internal conflicts continued to befall England. The predominantly-

[20] This list is not exhaustive. We leave inclusion of other relevant attributes, such as capital accumulation and state capacity—itself the focal point of the "development clusters" in Besley & Persson (2011)—-as opportunities for future research.

Protestant nobility faced particularly fierce opposition from the Jacobites—whose pro-Stuart rebellions after James' exile, in support of Catholic tolerance as well as Scottish and Irish nationalism, lasted into the mid-18th century. Such rebellions were met with brutality (i.e., low c). One such uprising in 1708 led to English treason laws being imposed on Scotland; another in 1745 led to the abolishment of the private courts of Scottish heritors (Kumar, 2003). The Catholic "Celtic fringe" of Ireland and Scotland were increasingly subjugated by the English elite (see Hechter, 1975).[21] Other salient cleavages within early-modern England were based not in religion but political and economic factors. The anti-industrialization Luddite movement inspired a series of riots between 1811 and 1816, which were eventually suppressed via military might. Several episodes of unrest, such as the Spa Fields riots in 1816 and the Peterloo Massacre in 1819, stemmed from the economic depression that followed the end of the Napoleonic Wars, which public sentiment attributed to the state (Stevenson, 1979).

Although many commoners across the British isles contested the elite during this period (i.e., high e_a), others were being increasingly incorporated into the English political economy. The various "Inclosure Acts" of the 18th and 19th centuries, which had on one hand left many commoners landless, had on the other hand helped to usher in a new and growing middle class—and squirearchy—of new local landholders (Heldring *et al.*, 2022). These new gentry saw themselves alongside the noble elite as embodying the nation and, with this broadening of the formal economy, a national consciousness that spanned class lines began to grow (Greenfeld, 1992).

National identification also spread spatially, as repression of dissent (i.e., low c and ϕ) hastened England's incorporation of the Celtic fringe. Of course, the English and Scottish elite had long since found common cause and identity, with Scotland formally joining Great Britain in 1707. By the mid-18th century, however, this cultural synthesis had extended to the intellectual elite, too, with leading thinkers in English literature, art, architecture, and philosophy borrowing heavily from their Scottish peers. Over time, "Scotland acquired a complex dual identity, [with] a civic Britishness overlying a Scottish cultural identity" (Goldie, 1996, 222). The full incorporation of the Celtic fringe into the United Kingdom in 1801 further consolidated a wide base of elite and commoners across the British Isles behind a more broadly *British*—but still heavily Protestant—identity, with a set of shared symbols ("Union Jack", the monarchy) reflecting a blend of cultural influences from across the British Isles (Kumar, 2003).

As England, and the United Kingdom more generally, grew as a nation-state and in turn expanded its tax base ($\downarrow \alpha$), state investments in public goods ($\uparrow G$) and technology ushered in the first Industrial Revolution ($\uparrow \pi^m_{nt}$). Increasingly after 1750, Acts of Parliament established turnpike trusts, which financed transport infrastructure, lowering travel times and freight charges and contributing to increased social savings and economic development (Bogart, 2005). Public investment in ship technology and canal construction initiated an unprecedented transportation revolution (Alvarez-Palau *et al.*, 2022). By the early 19th century, railways began to emerge in England's population density centers, creating large agglomerations and catalyzing a structural shift out of agriculture (Bogart *et al.*, 2022).

A Pervasive National Pride, 1830–1920. As the Industrial Revolution progressed, substantial conflict still plagued England from within. Along with the earlier riots of the 19th century, the 1830s saw the Swing and Rebecca riots, mounted by the landless and impoverished agricultural class (Stevenson, 1979). These cleavages collectively stemmed from England's public finance, which continued to repre-

[21] Dissenters of the Anglican mainstream were also often met with brutality by other commoners, the Sacheverell riots of 1710 and Gordon riots of 1780 being two prominent examples (Kumar, 2003).

sent a relatively narrow aristocracy (Acemoglu & Robinson, 2000). Resultant public revolt demanded various reforms, including land redistribution and public health measures, to which commitment required increased manhood suffrage. Reform Acts in 1832, 1867, and 1884 followed in turn, gradually extending the franchise to working class men and, in 1918, to many women as well.

These political transformations helped to further reduce social barriers between governing elites and the governed ($\downarrow \alpha$). The popular masses naturally found themselves more aligned with the elite identity than ever, insofar as electoral reform resulted in "a more representative Parliament in tune with the population anti-Catholic temper" of the masses (Kumar, 2003, 160). More abstractly, progress itself increasingly characterized the English national consciousness, with the country's historical narrative—spanning from the Magna Carta to the Glorious Revolution to the Reform Acts—demonstrating its capacity for evolution. With these themes of progress and continuity, a shared mentality of boundless growth and economic prestige unified England, as well as Britons across the British Isles and throughout its colonies, behind a new British exceptionalism (Greenfeld, 2001; Kumar, 2003).

To use the model's framing, these decreases in α provided new fuel for Britain's public finance and economic development. The period between 1870 and 1920 saw a more-than-doubling of tax revenues as a share of national income alongside the emergence of the British welfare state ($\uparrow G$), including the Education Act of 1870, which established universal primary education throughout England and Wales, as well as the first minimum wage and public unemployment insurance programs (Acemoglu & Robinson, 2000). These reforms importantly served not only the newly-enfranchised commoners but also stood to benefit many of the elite as well ($\uparrow \pi^m_{nt}$), particularly in urban areas (Lizzeri & Persico, 2004). With England's historical politico-economic class cleavages diminished, the United Kingdom entered the interwar period one of the richest—and by all metrics the largest—empires in history.[22]

6 Empirical Evidence: Measuring National Identity and its Correlates

In this section, we identify from country-level panel data a series of robust empirical correlations in line with the theory's main findings. Absent measures of national identification (NI) for countries, we construct a new time-varying index of NI using machine learning. To do this, we first combine a large and time-varying set of country-level variables with over three decades of survey data from the World Values Survey (2022). We use this to estimate the relative importance of the wide array of plausibly-relevant country-level predictors for individual national pride, conditional upon individual characteristics likely to influence the intensity and expression of NI. We then use a least absolute shrinkage and selection operator (LASSO) to identify an optimal set of predictors from this large set.

Using all LASSO-selected factors together with their estimates, we construct a set of time-varying NI scores at the country level. This index approximates the level of expressed national identification in a country, including its predicted dynamics within a country over time. While this index inevitably abstracts from some elements of NI, we treat it as a useful proxy, analogous to measuring utility from consumption using income.[23] We then document its correlations with the relevant variables in our model, with findings that are consistent with the theory. As we show, these correlations are neither an artifact of

[22] We choose to stop at 1920, after which the advent of nationalism and national identities throughout the British colonies foretold the subsequent break-up of the British Empire, as well as renewed Welsh and Scottish seccessionist movements.

[23] For a study of how views of American national identity vary across individuals, see Rosenberg & Beattie (n.d.). See Abdelal *et al.* (2009) and Hopf & Allan (2016) for other non-economic approaches to measuring identity. While we do not explicitly follow these approaches, our analysis includes various variables and ingredients previously suggested by these authors.

our choice of inputs in the process of constructing the NI index nor sensitive to the inclusion or exclusion of any given country-level predictor in the LASSO-based model.

6.1 What Determines National Identification?

In order to build an index of national identification (NI) at the country level, we first collect a large dataset of country-specific observables with which to predict the intensity of patriotic sentiment and pride among individuals in the World Values Survey (WVS) over time. This set of variables recalls the various investments in national identity (NI) discussed in Section 4 and is chosen based on a rich and multifarious set of theoretical and empirical literature on NI from across the social sciences.

Note that some countries or observables for which there are limited data are necessarily excluded, and in some cases, only time-invariant data are available or limited time-varying data render it necessary to average values over time. Nevertheless, we are able to generate a large-sample, large-variable, and time-varying dataset of predictors for 117 countries. We match this to the WVS sample, which includes 280,458 individuals across 81 countries for which the full set of country-level observables are available and spanning survey waves from 1981 (i.e., the advent of the WVS) through 2012 (i.e., when country-level data begin to become sparse). We now summarize these country-level observables.

Compulsory Participation. Our first category of relevant country-level factors involves compulsory forms of political and social participation. Prior literature has characterized the process of nation building via centralized institutions that homogenize citizens and bring their actions and ideals into alignment with those of state elites, such as public education and the military (Alesina *et al.*, 2021; Almagro & Andres-Cerezo, 2020; Caceres-Delpiano *et al.*, 2021; Miguel, 2004). In our analysis, we consider whether a country had a military draft during the sample period, using data from Asal *et al.* (2015); whether it had compulsory voting laws, using data from the Voter Turnout Database (2022); and a country's years of compulsory education, using countries' sample average from the World Bank's World Development Indicators (2022) database. States may also mandate forms of religious participation, including compulsory adherence, or ban religious participation altogether. We thus also consider state control of religion, as well as the official state status of religion, using data from Fox (2019).[24]

War and Conflict. The second category of country-level NI determinants involves conflict (Caceres-Delpiano *et al.*, 2021; Dell & Querubin, 2017; Gehring, 2021; Sambanis *et al.*, 2015). Declarations of war are often associated with "rally-round-the-flag" effects and may bridge divides among the masses and between the masses and elites. Foreign occupation events may oust elites and destroy national symbols and narratives. And, depending on their source and public support, coups may either divide the nation or unify the masses for or against it. We collect time-varying data on war events from the Correlates of War (2021), foreign occupation events from the Polity5 (2020), and successful and failed coups from 1981 through 2012 from Peyton *et al.* (2021).

International Competition. The third category of factors involves non-military forms of competition across countries, in which success may foster feelings of national unity and pride (Depetris-Chauvin *et al.*, 2020). We consider two such competitions: the Olympic Games and the FIFA World Cup (Tomlinson & Young, 2006). Our main variables of interest are the number of gold medals a country won in

[24] As this latter dataset begins in 1990, we consider whether a country had these at any point since 1990.

the previous Summer Olympics, sourced from The Guardian (2017), and a dummy for whether it won the most recent World Cup from FIFA (2012) in a given year.[25]

Institutional History. Like institutions for compulsory participation, the homogenization of political identity may also occur through state history and accompanying narratives, which we consider in a fourth category of predictors (Ahlerup & Hansson, 2011; Dessi, 2008). We factor in state antiquity using the extended index from Borcan *et al.* (2018). Alongside this, we include two other measures of state age. The first is a time-varying measure of the years since a country's most recent constitution, based on Elkins *et al.* (2012). The second captures the year of a country's oldest university (Erudera, 2021).[26] Finally, younger and post-colonial states often have citizenship laws based on birthright, or *jus soli*, rather than on nationality or ethnicity. We include a time-invariant indicator for this from Vink *et al.* (2021).

Size and Social Distance. The fifth and final set of variables involves the size and diversity of nations. On one hand, large states and those with high levels of diversity may experience more conflict and enjoy less social cohesion (Alesina & Spolaore, 2005; Alesina *et al.*, 2021; Bazzi *et al.*, 2019; Miguel, 2004). On the other hand, even highly diverse countries have unifying symbols and narratives. Moreover, ethnic diversity may heighten feelings of nationalism among groups with disproportionate political sway (Masella, 2013). We include two time-varying measures of country size in our regression: logged population levels and logged land area (in square km), both from the World Development Indicators (2022). We also adopt three measures of diversity. The first is a time-varying measure of ethnic fractionalization from Drazanova (2020). The second and third are measures of ethnolinguistic fractionalization and polarization from Desmet *et al.* (2012). These are defined and entered at various levels of linguistic aggregation, though we treat level 1 cleavages, defined at high levels of linguistic aggregation, as our regressors of primary interest. Whereas high levels of fractionalization imply high levels of diversity, high levels of polarization reflect multiple comparably large groups and may be a better proxy for ethnic and linguistic competition.

6.2 Modeling National Identification

We next turn to survey data from the World Values Survey (WVS). As in previous literature, we use the measure of expressed national *pride* among WVS respondents, which has the best spatial and temporal coverage (Ahlerup & Hansson, 2011; Shayo, 2009; Harutyunyan, 2019).[27] For the purposes of measuring national identification for countries, existing studies tend to average or otherwise aggregate responses from individuals within countries cross-sectionally, often across waves (see, for instance, Masella, 2013). We now introduce our approach to modeling national identity for countries, in which machine learning is used to expand these limited WVS data into a large, time-varying country-level national identification index,

[25] We further control for total medals in the Summer Olympics, medals in the Winter Olympics, and total World Cup wins.

[26] These time variables are normalized to be between zero and one for ease of interpretation and are entered flexibly using quadratic and cubic interaction terms.

[27] In particular, we use a version of G006 ("How proud are you to be [nationality]"), defining "quite proud" and "very proud" as a 1 and "not very proud" and "not at all proud" as a 0. Results throughout Tables 1–4 are robust to instead including "quite proud" in the second grouping. Other questions in the WVS, such as regarding relative identification with one's country (G021), are asked for only a small number of waves. For the subset of waves asking both, the within-country-year association between our "pride" indicator and one based on G021 is .230 (.004), i.e., nearly the former's standard deviation.

$$NI_{ct} = f(\mathbf{X}_{ct}),$$

where $\mathbf{X}_{ct}$ is a time-varying vector of observable country-level predictors of national identification, as described in the previous subsection. We estimate a functional form for f by regressing our individual-level national pride indicator from the WVS, NI_{ict}, on $\mathbf{X}_{ct}$, together wth a set of individual characteristics. Concretely, we estimate:

$$NI_{ict} = \alpha + \mathbf{B}\mathbf{X}_{ct} + \Gamma_{ict} + \varepsilon_{ict}. \tag{19}$$

Γ_{ict} includes a respondent's survey wave year as well as dummies for sex, age, ethnic majority status, and geocultural region. Together, this accounts for factors likely to influence both levels and outward expressions of national pride among respondents. Standard errors are clustered at the country level.

As the set of variables in $\mathbf{X}_{ct}$ is large, we utilize a LASSO machine learning technique, which constructs an optimal model of predictors for estimating equation (19). Specifically, LASSO selects the factors that best fit the outcome variation in the survey data, while forcing all other coefficients to zero.[28] We then use this empirical model to construct our country-level NI index, $NI_{ct} = \hat{\mathbf{B}}\mathbf{X}_{ct}$, adopting the estimates $\hat{\mathbf{B}}$ from the LASSO regression as the vector of factor weights. We later show robustness of our core country-level correlations to using a more flexible functional form for $f(\mathbf{X}_{ct})$ that also includes squared terms for the (continuous) country-level predictors from which the LASSO selects.

Estimates from OLS and LASSO regressions of equation (19) can be found in Table 1. Column 1 shows coefficients for our main country-level factors, controlling for survey year but no other respondent characteristics. Column 2 extends this to include respondent characteristics, with little change to the majority of the estimates.[29] Column 3 applies the LASSO, dropping a large number of coefficients in the process. A few patterns emerge. First, two classes of predictor seem less important for explaining variation in NI: non-military international competition and institutional history. These covariates get dropped by the LASSO in column 3. Second, several country-level factors remain relevant and statistically significant across specifications. These include (i) state control of religion, which is associated with higher levels of NI; (ii) newly declared wars, which are associated with increases in NI; and (iii) foreign occupation events, which are associated with decreases in NI. Other factors become relevant only as others are dropped. These include (iv) mandatory conscription, which is associated with higher levels of NI, and (v) coup events, which favor upticks in NI in the LASSO specification. Among these factors, external conflict appears to be particularly relevant.

Finally, we use the coefficients from column 3 to predict the levels and dynamics of national identity within countries for which all country-level observables are available spanning the 1981–2012 period. These predicted values are then normalized around zero, becoming the indexes we use in our analysis in the next subsection. Such indexes should be interpreted with some caution, given various empirical and epistemological limitations faced in their construction.

We acknowledge three concerns of note that exist in the construction and interpretation of the NI scores. First, there are questions of external validity. While we use data from the WVS to construct

[28] Note that these should not be interpreted as predictors of NI in a causal sense, but rather in the sense that they explain the variation in NI in the data optimally within the larger set of covariates.

[29] The set of covariates used for columns 1–2 explains almost all of the country-level variation in the outcome: including the full set of country×year fixed effects as covariates increases the adjusted R^2 for column 2 only slightly, from 0.08 to 0.09.

the model used to predict NI at the country level, there is no way to know for sure as to how externally valid these data and the resulting weights, $\hat{\mathbf{B}}$, are to countries not present in the WVS. Hence, while we construct NI scores for all countries with data for all relevant country-level observables through 2012, our preferred index includes only countries also featured in the WVS.

Second, there is the question of preference falsification, wherein respondents' *expressed* national pride reflects not their true level of NI but rather is biased, upward or downward, by institutional or historical factors in their setting (Kuran, 1997). While we do our best to control for factors likely to influence expressions of national pride, the use of survey data ultimately limits our ability to identity respondents' true preferences and identities. The resulting country-level scores may in turn inherit some of this bias. This is a longstanding challenge associated with measuring NI using survey data, to which existing work has been particularly prone, to the extent that it generally involves comparisons of scores cross-sectionally across countries. In contrast, our creation of a *panel* of scores importantly allows for the use of country fixed effects to further control for certain country-specific factors—including country-wide preference falsification—in our analyses using the scores below.

Finally, there is the question of whether NI can be adequately captured by a one-dimensional score, as attempted here and in previous literature. Although we are ultimately limited by measurement—in the sense that the WVS's "pride" question is unique in being posed across a very large set of countries and years—we acknowledge that this captures perhaps only part of NI, and future data efforts are needed to capture the multi-dimensionality of NI and provide superior measures.

6.3 National Identity, Public Goods, and Economic Performance

To examine the theory's key relationships between national identity, public goods, and modern economic development, we estimate the panel regression:

$$y_{ct} = \mu_c + \theta_{ct} + \beta NI_{ct} + \epsilon_{ct}, \tag{20}$$

where y_{ct} is the time-varying macro development indicator for country c (i.e., real GDP per capita, public goods expenditures per capita) and NI_{ct} corresponds to the LASSO-based NI scores estimated above, $NI_{ct} = \hat{\mathbf{B}}\mathbf{X}_{ct}$. This measure is normalized around zero, such that a unit increase represents a standard deviation increase in NI score within that index. Figure 1 illustrates some of the variation in this index within countries, with panel (a) plotting scores in 1997 relative to 1982 and panel (b) plotting scores in 2012 relative to 1997.[30] μ_c controls for all country-specific unobservables. These could, for example, include geographic fundamentals as well as cultural factors affecting the relationship between NI_{ct} and y_{ct}, such as country-wide preference falsification (Kuran, 1997). θ_{ct} denotes other country-level factors with time-varying effects. Insofar as variables are likely to be both serially and spatially correlated in our cross-country panel analysis, we report standard errors based on the Conley (1999) spatial heteroskedasticity-autocorrelation (HAC) consistent procedure, which allows for correlation in unobservables across countries and over time. For our baseline estimation, we adopt a spatial radius bandwidth of 1000 km and a time lag of 10 years. We also show robustness to other standard error

[30] While many countries have NI scores that are seemingly quite stable, some countries, such as the United States and the United Kingdom, have seen notable declines over time. Other countries are only present in the second half of the sample. Particularly striking within this latter group is the case of the Germany, whose NI score is one of the lowest, especially in the years following German reunification, something previously noted in Shayo (2009).

adjustments, including a two-way cluster by country and year.

Economic Performance. We begin by examining how levels of NI relate to economic development within a country over time. In the theory, NI facilitates a consensus between elites and the masses behind the provision of productive public goods, boosting the national income. Table 2 examines this latter prediction, based on regressions of real GDP per capita on the NI index developed above. Our preferred specification (column 2) accounts for potential time-varying effects of national institutions on economic performance (Acemoglu *et al.*, 2005), using Polity2 scores from Polity5 (2020). To proxy for relatively deep institutional attributes, as opposed to contemporaneous fluctuations in outward signals of institutional quality, we construct a time-invariant indicator, which equals 1 if a country's mean Polity score across the sample period is greater than the sample median. We then interact this with year fixed effects. This estimate suggests that, within a country,[31] a 1 standard deviation increase in NI is associated with about $260 additional GDP per capita (2015 USD), relative to a sample mean of about $11,800.

Besides institutions, another important driver of economic activity is geography (Diamond, 1997; Sokoloff & Engerman, 2000). Although country fixed effects serve to absorb much of this variation already, columns 3 and 4 additionally control for country longitude- and latitude-time linear trends as a further check that time-varying effects of locational factors, such as endowments and proximity to the equator, are not confounding estimates. Estimates here remain large and statistically significant at conventional levels. Overall, dynamics in NI appear to map closely to, and positively with, a country's economic performance over the sample period.

Public Goods Provision. Modern economic development is highly correlated with the size and growth of the public sector (Lindert, 2004; Besley & Persson, 2011). For instance, among the countries in our sample, a dollar increase in government final consumption expenditures per capita is associated with about a $1.88 (.23) increase in real GDP per capita, exceeding a purely mechanical effect of public expenditures on GDP.[32] Our theory suggests public goods provision as a key channel through which NI favors increased economic performance. Our next set of exercises thus considers government expenditures on public goods. We examine overall final consumption expenditures, as well as expenditures specifically toward education and the military, these being the two categories for which the World Development Indicators (2022) data have broad sample coverage. We also consider a residual spending category, which subtracts education and military spending from overall expenditures. This encompasses other types of public goods for which official data are often lacking, such as health and transportation.

Correlations between a country's NI and its public good expenditures are indeed strong and positive. Columns 1–3 of Table 3 show that a standard deviation increase in NI is associated with an additional $64–108 spent per capita on public goods, relative to a sample mean of about $1,625 per capita. This association is robust to controlling for time-varying effects of institutions and geography. Breaking out expenditure type, this effect is present for public education (columns 4–6) but not military spending (7–9), the latter being an essential public good arguably less relevant to our theory. For the former, a standard deviation increase in NI is associated with an additional $33–59 spent per capita on public education, relative to a sample mean of about $500 per capita, which is about twice as large as the effect for overall public expenditures. Public education being a productive public good, this effect is likely to drive increases in economic development over time, akin to the mechanism in our model. Finally,

[31] After absorbing country fixed effects, the sample standard deviation in NI scores is 0.33.

[32] This estimate is based on our preferred specification, which includes both country and institutions×year fixed effects.

a positive relationship re-emerges for the residual spending category (columns 10–12).[33] Insofar as public education may be correlated with national identity in other ways, given for instance its role in facilitating national pride (Alesina *et al.*, 2021), it is reassuring that public expenditures related to health and transportation also exhibit a positive correlation with NI.

Using Alternative Standard Errors. The statistical significance of our estimates is robust to alternative inference procedures accounting for spatial and serial autocorrelation in residuals. Appendix Table A.1 re-estimates the baseline regressions from Tables 2 and 3 using (i) Conley (1999) standard errors with alternative spatial bandwidths of 500 km and 2500 km and alternative time lags of 1 year and 30 years, (ii) standard errors clustered at the country level, and (iii) standard errors two-way clustered at the country and year level. All relevant estimates retain statistical significance at conventional levels.

Expanding Sample of Countries. Our core analysis includes only countries for which there exist respondent data from the WVS with which to match our set of country-level observables, given our inability to test the external validity of our empirical model to other countries on which the LASSO model was not trained. Nevertheless, it would be reassuring if our results were to generalize to including all 117 countries with sufficient country-level data to construct index scores through 2012. In Appendix Table A.2, we re-estimate key results from Tables 2 and 3 using this larger set of countries. Estimates are largely unchanged, albeit somewhat more precise, given the added power of the larger sample. While we do not take this to imply external validity, given the caveats stated above, this nonetheless speaks to the continued salience of the factors identified by our LASSO model in this broader sample.

Varying LASSO Model. To further ensure that estimates are not merely an artifact of our choice of model inputs in the process of constructing NI_{ct}, we try varying the components used in equation (19) above in two ways. First, we use an alternative national pride indicator NI_{ict} along the lines described in footnote 27, with only "very proud" respondents being coded in the affirmative. Second, we include in $\mathbf{X}_{ct}$ squared terms for all country-level predictors from which the LASSO selects. The resultant NI scores from these are highly correlated with our baseline (corr. $= 0.73$ and 0.95, respectively) and result in similar baseline estimates, as shown in Appendix Table A.3.

Sensitivity to Country-level Factors. Just as estimates are not an artifact of our model inputs, our core correlations are not sensitive to the inclusion or exclusion of any particular country-level predictor in our final LASSO-based model, $NI_{ct} = \hat{\mathbf{B}}\mathbf{X}_{ct}$. Setting $\hat{B}_j = 0$ one-by-one for each of the ten country-level factors j in column 3 of Table 1, we construct a set of alternative NI indexes and then re-estimate columns 2 of Tables 2 and 3. Shown together in Appendix Figure A.1, no correlation differs statistically across any of the ten alternative NI models for either outcome, and all remain statistically different from zero at conventional levels. This is reassuring, insofar as some elements that go into constructing the NI scores may, individually, be related to the outcome variables of interest (e.g., years of compulsory schooling and public good provision). The results of this sensitivity exercise suggest that this is unlikely to be mechanically driving our correlations of interest. As a further check, Appendix Figure A.2 includes these same factors one-by-one as controls in our country-level analysis. Again, the correlations between our NI scores and outcomes do not appear to be driven by any one predictor from the LASSO-based

[33] Results throughout Tables 2 and 3 are robust to using a subsample available across all outcomes ($N = 1,241$). Estimates based on our preferred specification (e.g., column 2 in Table 2) are 975.4 (377.8) for real GDP per capita, 453.9 (190.7) for overall expenditures per capita, 159.8 (59.6) for education expenditures, and 282.3 (126.7) for residual expenditures.

model. Overall, these results suggest that the relevant variation in NI captured by our scores emerges from the aggregate of all factors, rather than from any one factor.

Interpreting Signs on Coefficients. Our findings thus far contrast with negative correlations found in previous literature between national pride and GDP per capita (Ahlerup & Hansson, 2011) and public goods provision (Harutyunyan, 2019; Shayo, 2009). Yet, it is important to note that existing approaches to measuring national identity at the country level generally involve aggregating survey responses within countries, often across waves, resulting in associations based on cross-sectional variation in national identification across countries. In contrast, our approach involves modeling dynamics in NI based on time-varying country-level shocks. This, in turn, lets us study how changes in NI map to changes in macro indicators within countries over time. This panel estimating framework with country fixed effects ultimately reverses the negative correlations found in prior literature.

The Role of Political Restraints. In the model, elites may be subject to political restraints, such as democratic institutions, which induce commitment to low taxes. Only in a sufficiently egalitarian polity does national identification tend to give rise to widespread public goods provision and its economic benefits. In the absence of such restraints, meanwhile, there is low NI, and any public goods provision and income growth that do occur are as such independent of NI. In this next exercise, we examine how our core results vary with political restraints, by interacting NI scores with a country-level institutions indicator, as defined above. Recall that because the Polity2 scores on which this institutions measure is based partly reflect contemporaneous (endogenous) political outcomes, as well as the relatively "deep" institutional attributes with which the theory is concerned, we adopt a time-invariant transformation, which equals 1 if a country's mean score across the sample period is greater than the sample median. If political restraints are necessary for NI to give rise to a public goods-providing state and ensuing economic development, we would expect this interaction coefficient to be positive.

Table 4 shows this to be the case. For both GDP per capita and per capita government expenditures, there is a positive correlation with NI specifically among countries with more democratic institutions (even columns), which is slightly larger than the overall associations (odd columns). Otherwise, correlations are much smaller and close to zero. The differences in magnitudes between the estimates for these two groups are shown to be statistically significant at conventional levels.

Given its broad time coverage, our preferred measure of institutions is based on countries' Polity2 scores from Polity5 (2020). At the same time, this measure may be an imperfect proxy for the political restraints in our theory (i.e., the theory does not require democracy, but rather sufficient restraints on the elites). Thus, as an additional check, we replicate this analysis using alternative measures of institutions from the World Governance Indicators (2021). Although the latter's more limited time coverage precludes us from emphasizing this exercise too much, the World Governance Indicators data nonetheless bring the added benefit of having four rather distinct indexes of institutional quality for countries: political stability, accountability and voice, rule of law, and control of corruption. Based on these, we repeat our analysis from Table 4, now using four interaction terms instead of one.

Estimates from this exercise, shown in Appendix Table A.4, are substantively similar to those in Table 4. The baseline coefficients for both real GDP per capita (columns 1–5) and government final consumption expenditures (columns 6–10) are often small and in fact never positive. Meanwhile, all four interaction effects are large, positive, estimated significantly at conventional levels. When entered altogether in columns 5 and 10, the aggregates of these interaction effects are likewise positive and

precisely estimated. Overall, these results further corroborate our theory and suggest that elites may have strong incentives to commit to some representative institutions, insofar as NI hastens both public goods provision and economic performance in more egalitarian polities in particular.

Reductions in Internal Conflict. Underpinning our theory is the assumption that national identification facilitates a consensus between elites and the masses, helping modern states to overcome internal conflicts and grow. Absent a quasi-experimental framework for isolating a causal effect of NI on internal conflict, however, it is difficult to test this argument. Indeed, NI is, as we show, endogenous to conflict, with most of those coefficients being estimated positively in Table 1.

To nevertheless explore this assumption and bolster our theoretical interpretation of the correlations in this section, we develop a time-varying country-level measure of internal conflict, based on onset of violence by state actors against citizens of a different ethnic category (Fjelde *et al.*, 2019).[34] Crucially, such events reflect underlying cleavages between elites and the masses at the heart of our theory, while also being relatively distinct from the measures of external and intra-elite conflict that comprise our LASSO-based model of NI. These data are limited to years after 1989, to which we limit the analysis.

Insofar as our assumption is empirically founded, we would expect increases in the overall NI of countries to decrease the salience of these internal conflicts and reduce onset of new violence. We adapt equation (20), with our indicator of internal conflict as the outcome, and then repeat the same set of regressions from Table 2. Consistent with our argument, the results in Table 5 suggest that greater NI is negatively associated with onset of violent conflict between the state and ethnic groups, with a one (within-country) standard deviation increase in our NI scores resulting in about a 0.7 percentage point decrease in the probability of the latter—approximately a 35% decrease on the sample mean.

7 Conclusion

Is it a coincidence that the modern nation-state emerged and the modern economy spread throughout the world around the same time? In this paper, we have made the case that the two are, in fact, related. We have provided a novel framework for understanding the relationship between national identification in countries and the provision of productive public goods. Inducing mass identification with the nation, we argue, helps ruling elites secure public acquiescence to the state and to its preferred public finance. Insofar as this reduces internal resistance to the elite, revenues can be more readily collected and public goods broadly provided, for the mutual betterment of elites and commoners. The viability of this mechanism, however, depends on the presence of political restraints on elites. This framework can help explain why national identification and various dimensions of state development have historically co-evolved in modern states. We offer empirical and case evidence in support of the theory, upon which we hope future empirical research will ultimately expand. Our framework also leaves room for further theoretical extensions, with the potential to formally include other empirically-important components of modern states and economies, such as state capacity and capital accumulation.

[34] Specifically, we code a 1 for country-years if they saw the state advance new entry into such violence.

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Tables and Figures

Table 1: Country-level Predictors of Individual National Pride

Dependent variable:	Proud of your nationality? (WVS)		
	(1)	(2)	(3)
Years of compulsory education	0.001	0.004	-0.004
	(0.006)	(0.004)	(0.004)
Mandatory voting?	0.044*	-0.005	0.015
	(0.024)	(0.020)	(0.018)
State control of religion?	0.082**	0.142***	0.066**
	(0.035)	(0.038)	(0.029)
Official state religion?	-0.020	-0.037	
	(0.022)	(0.026)	
Any military draft?	-0.024	0.020	0.049**
	(0.025)	(0.023)	(0.023)
New war in year t?	0.109***	0.087***	0.075***
	(0.036)	(0.033)	(0.027)
Any foreign occupation in year t?	-0.070*	-0.113***	-0.073***
	(0.041)	(0.038)	(0.027)
Any coup in year t?	-0.081*	-0.014	0.082**
	(0.048)	(0.029)	(0.041)
# Gold medals, last summer Olympics	0.000	0.001	
	(0.001)	(0.001)	
Won previous World Cup?	0.023	0.064**	
	(0.023)	(0.025)	
Ext. state history index	-0.105	0.095	
	(0.075)	(0.082)	
Years since most recent constitution	-0.331	-0.050	
	(0.221)	(0.178)	
Year of oldest university	1.300	0.580	
	(0.978)	(0.801)	
Jus soli citizenship?	0.004	-0.077***	
	(0.024)	(0.025)	
Country size (log population in year t)	-0.025*	-0.038**	-0.006
	(0.015)	(0.015)	(0.008)
Country size (log area in year t)	0.026***	0.023***	
	(0.008)	(0.008)	
Ethnic fractionalization (time-varying)	0.041	0.030	0.049
	(0.054)	(0.055)	(0.047)
Ethnolinguistic fractionalization (level 1)	1.022	2.444***	0.118
	(0.624)	(0.708)	(0.075)
Ethnolinguistic polarization (level 1)	-0.475	-1.255***	
	(0.325)	(0.395)	
Estimator	OLS	OLS	LASSO
Survey wave fixed effects	Yes	Yes	Yes
Geocultural region fixed effects		Yes	Yes
Age fixed effects		Yes	Yes
Sex fixed effects		Yes	Yes
Ethnic majority fixed effects		Yes	Yes
Observations	280,458	273,255	273,255
Adj. R^2	0.06	0.08	0.06

Note: Other country-level predictors include total medals in last summer Olympics, gold and total medals in last winter Olympics, total World Cup wins, a dummy for coup attempts, quadratic and cubic terms for years since most recent constitution and year of oldest university, and higher level measures of ethnic fractionalization and polarization. Respondent-level controls include survey wave in all columns, as well as dummies for age, sex, world geocultural region, and ethnic majority status in columns 2–3. Standard errors clustered at the country level reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: National Identity and Economic Performance

Dependent variable:	Real GDP per capita			
	(1)	(2)	(3)	(4)
National identity score	868.100***	782.927***	631.104***	503.511***
	(237.069)	(229.150)	(213.469)	(163.541)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Institutions × year FE		Yes		Yes
Geography-time linear trends			Yes	Yes
Observations	2,223	2,223	2,223	2,223
Adj. R^2	0.01	0.22	0.11	0.36

Note: Regressions of real GDP per capita (2015 USD) on NI scores for countries from 1981 through 2012. All regressions include country and year FE. Columns 2 and 4 interact year FE with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Columns 3 and 4 include longitude×year and latitude×year linear trends. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: National Identity and Public Goods Provision

Dependent variable:	Government consumption expenditures per capita			Public education expenditures per capita			Military expenditures per capita			Residual expenditures per capita		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
National identity score	326.245***	277.791***	195.460**	178.750***	157.254***	101.339**	3.927	4.195	-3.179	369.442**	299.724**	213.891**
	(124.712)	(104.109)	(79.331)	(63.083)	(52.188)	(42.522)	(9.460)	(9.128)	(7.951)	(155.591)	(124.631)	(95.915)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institutions × year FE		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Geography-time linear trends			Yes			Yes			Yes			Yes
Observations	2,149	2,149	2,149	1,349	1,349	1,349	2,154	2,154	2,154	1,269	1,269	1,269
Adj. R^2	0.01	0.26	0.42	0.02	0.27	0.39	0.00	0.08	0.13	0.01	0.30	0.45

Note: Regressions of various government final consumption expenditures relative to total country population on NI scores from 1981 through 2012. All regressions include country and year FE. Columns 2–3, 5–6, 8–9, and 11–12 interact year FE with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Columns 3, 6, 9, and 12 also include longitude×year and latitude×year linear trends. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: The Role of Political Constraints

Dependent variable:	Real GDP per capita		Government consumption expenditures per capita		Public education expenditures per capita		Residual expenditures per capita	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
NI score	782.927***		277.791***		157.254***		299.724**	
	(229.150)		(104.109)		(52.188)		(124.631)	
NI × Less democratic		137.065		25.367		9.522		14.555
		(109.302)		(21.104)		(10.483)		(13.647)
NI × More democratic		1738.969***		668.728***		334.575***		758.436**
		(483.555)		(255.903)		(113.807)		(314.144)
Coeff. equality p-value		0.001		0.012		0.004		0.018
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institutions × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,223	2,223	2,149	2,149	1,349	1,349	1,269	1,269
Adj. R^2	0.22	0.23	0.26	0.27	0.27	0.28	0.30	0.31

Note: Regressions of real GDP per capita (columns 1–2) and government final consumption expenditures relative to total country population on NI scores from 1981 through 2012. All regressions include country FE as well as year FE interacted with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Even columns interact NI scores by this institutions indicator and report estimates for each subgroup. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: National Identity and Internal Conflict

Dependent variable:	Onset of internal violence			
	(1)	(2)	(3)	(4)
National identity score	-0.022**	-0.021**	-0.021**	-0.021**
	(0.010)	(0.010)	(0.010)	(0.010)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Institutions × year FE		Yes		Yes
Geography-time linear trends			Yes	Yes
Observations	1,805	1,805	1,805	1,805
Adj. R^2	0.00	0.02	0.00	0.02

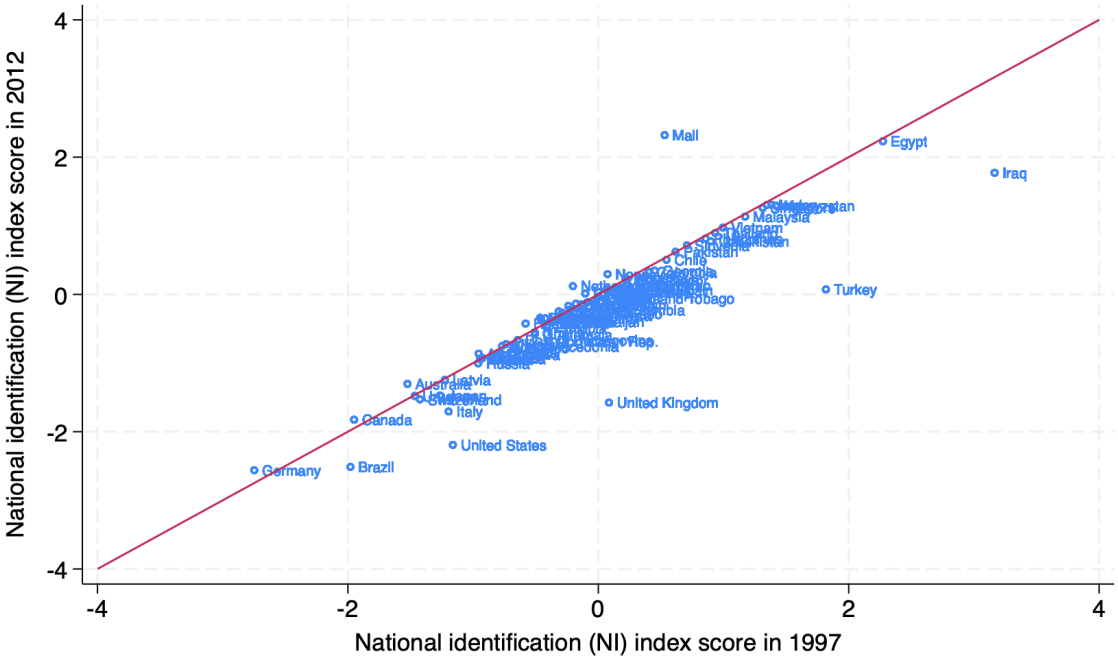
Note: Regressions of onset of intentional state-led violence against citizens on NI scores for countries from 1990 through 2012. Outcomes are coded from Fjelde *et al.* (2019) based on years t that saw the onset of such violence relative to $t-1$, restricted only to events that were state-led and occurred within-country. All regressions include country and year FE. Columns 2 and 4 interact year FE with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Columns 3 and 4 include longitude×year and latitude×year linear trends. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 1: National Identity Scores, Across Countries and Over Time

(a) 1982–1997



(b) 1997–2012



Notes: Plots show, for illustrative purposes, changes between 1982 and 1997 (panel a) and 1997 and 2012 (panel b) in countries' national identification (NI) scores, as generated by equation (19), using the sample of countries featured in the World Values Survey. Points above (below) the 45 degree line correspond to increases (decreases) in NI scores across these years.

Appendix

On Proposition 1

To derive the equilibrium shares and payoffs in (7) and (8), we first need to determine the equilibrium efforts e_n^* and e_a^*. To do so, we differentiate (6) with respect to each player's strategy:

$$\frac{\partial \pi_e^I(e_n, e_a)}{\partial e_n} = \frac{e_a}{(e_n + e_a)^2} A(T + \alpha) - c,$$
$$\frac{\partial \pi_{ac}^I(e_n, e_a)}{\partial e_a} = \frac{e_n}{(e_n + e_a)^2} \phi A(T + \alpha) - 1.$$

By setting each derivative equal to 0 and after sufficient manipulation we obtain the following unique equilibrium values:

$$e_n^* = \frac{\phi}{(1 + c\phi)^2} A(T + \alpha),$$
$$e_a^* = \frac{c\phi^2}{(1 + c\phi)^2} A(T + \alpha).$$

The shares and payoffs in (7) and (8), as well as the properties in Proposition 1, follow straightforwardly.

On the Choice between National and Alternative Identification

In each period t, the commoners make a choice between the national and the alternative identity. To do so, they compare the payoffs, both material and psychological, under the two identities. Because the decision made by commoners largely concerns variables in the current period only, we drop the subscripts t over the relevant variables as short hand. The only case of a variable of concern that is not from the current period is the investment from the previous period, which we denote by $g_-(= g_{t-1})$, as the elites of the previous period takes account of its effect on the choice of identity by commoners in the subsequent period. The individual payoff of the alternative identity is the following:

$$\pi_{ac_\delta}(\alpha) = (\frac{c\phi}{1 + c\phi})^2 \phi A(\frac{T}{\alpha} + 1)(1 + \sigma_a).$$

The payoff of the alternative identifiers does not depend on $\delta \in [0, \Delta]$, as they would suffer the alienation penalty only if they were to adopt the national identity. The main variable of interest is how the individual payoff of alternative identifiers varies with the share of commoners who share the alternative identity. In particular, we have

$$\frac{\partial \pi_{ac_\delta}(\alpha)}{\partial \alpha} = -(\frac{c\phi}{1 + c\phi})^2 \phi A \frac{T}{\alpha^2}(1 + \sigma_a) < 0.$$

As α increases, the per-alternative-identifier portion of insecure income T goes down because there are more alternative identifiers to share the proceeds from the rents T. This implies that the minimum individual payoff for an alternative identifier is when no commoner identifies with the nation and equals $\pi_{ac_\delta}(1) = (\frac{c\phi}{1+c\phi})^2 \phi A(T + 1)(1 + \sigma_a)$.[35]
Turning to the payoff of a national identifier, we have:

$$\pi_{nc_\delta}(\alpha) = G^\gamma \left(1 + \sigma + \frac{\sigma\beta R}{1 - \alpha}\right) - \frac{g}{\beta R + 1 - \alpha} + \sigma_n - \delta.$$

[35] Note that π_{aci} is convex given that $\frac{\partial^2 \pi_{aci}}{\partial \alpha^2} = 2(1 - p^*)^2 \phi A \frac{T}{\alpha^3}(1 + \sigma_a) > 0$.

The first term includes the gross material and status payoffs, the second term represents the tax (assuming a balanced budget), σ_n is the fixed relative status term (which could include the valuation of material payoffs of possible competitors), and δ is the alienation cost in identifying with the nation while sharing the alternative heritage of a commoner (note also that $G = (1-d)G_- + g_-$).

This last term is the main source of variation for commoners. Reasonably, no commoner who has a higher δ than another commoner will identify nationally unless the latter identifies with the nation. That is, we maintain that α and δ are related through $1-\alpha = F(\delta)$ (where $F(\delta)$ is the cdf of $\delta \in [0, \Delta]$) such that $\delta(\alpha)$ and all those who identify with the nation have $\delta \leq \delta(\alpha)$ while those with $\delta > \delta(\alpha)$ adhere to the alternative identity. A computationally useful cdf is the uniform distribution whereby $F(\delta) = \frac{\delta}{\Delta}$; then, given that $\alpha = 1 - F(\delta) = \frac{\Delta - \delta}{\Delta}$, we have $\delta(\alpha) = (1-\alpha)\Delta$ (and in general $\delta(\alpha) = \frac{-1}{f(\delta)}$ where $f(\delta)$ is the pdf). The question is whether there is a $\bar{\delta} = \delta(\bar{\alpha})$ such that all commoners with a lower δ than that one have a higher payoff under the national identity while those with a higher prefer the alternative identity.

Note that $\pi_{nc_\delta}(0) = G^\gamma(1+\sigma+\sigma\beta R) - \frac{g}{\beta R+1} + \sigma_n - \delta (\geq \pi_{nc_\Delta}(0) = G^\gamma(1+\sigma+\sigma\beta R) - \frac{g}{\beta R+1} + \sigma_n - \Delta$ for all $\delta \in [0, \Delta]$) is finite and therefore strictly smaller than $\pi_{ac_\delta}(0)$ (which goes to infinity). Moreover, $\pi_{nc_\delta}(1)$ goes to infinity and therefore $\pi_{nc_\delta}(1) = \pi_{nc_0}(1)$ is strictly greater than $\pi_{ac_\delta}(1)$.

Then, given $\pi_{nc_\delta}(0) < \pi_{ac_\delta}(0)$ and $\pi_{nc_\delta}(1) > \pi_{ac_\delta}(1)$, and $\pi_{nc_\delta}(\alpha)$ and $\pi_{ac_\delta}(\alpha)$ are continuous in α, we have the following result:

Lemma 1: *There exists at least one $\bar{\alpha}$ and associated $\bar{\delta} = \delta(\bar{\alpha})$ such that (i) $\bar{\alpha}$ commoners adhere to the alternative identity while $1-\bar{\alpha}$ commoners identify with the nation; (ii) those with $\delta \leq \bar{\delta}$ identify with the nation and those with $\delta > \bar{\delta}$ adhere to the alternative identity. Moreover, $\bar{\alpha}$ and $\bar{\delta}$ are unique under the sufficient condition $\frac{\partial \pi_-(\alpha)}{\partial \alpha} \geq 0$* where $\pi_-(\alpha) \equiv \pi_{nc_\delta}(\alpha) - \pi_{ac_\delta}(\alpha)$.

Proof. Existence of $\bar{\alpha}$ and $\bar{\delta}$ come from the continuity of the two payoff functions and their boundary properties ($\pi_{nc_\delta}(0) < \pi_{ac_\delta}(0)$ and $\pi_{nc_\delta}(1) > \pi_{ac_\delta}(1)$). For uniqueness, consider:

$$\pi_-(\alpha) = G^\gamma\left(1+\sigma+\frac{\sigma\beta R}{1-\alpha}\right) - \frac{g}{\beta R+1-\alpha} + \sigma_n - \delta(\alpha) - (\frac{c\phi}{1+c\phi})^2\phi A(\frac{T}{\alpha}+1)(1+\sigma_a).$$

Consider the derivative:

$$\frac{\partial \pi_-(\alpha)}{\partial \alpha} = \frac{G^\gamma \sigma\beta R}{(1-\alpha)^2} - \frac{g}{(\beta R+1-\alpha)^2} + \frac{1}{f(\delta)} + (\frac{c\phi}{1+c\phi})^2 A(\frac{T}{\alpha^2})(1+\sigma_a).$$

Note that all the terms except the second one are positive and, given the terms involved, it is reasonable to have the derivative be non-negative. Then, given that $\pi_-(0) < 0$ and $\pi_-(1) > 0$, there must be a unique $\bar{\alpha}$ and $\bar{\delta}$. □

In fact, uniqueness is guaranteed under the weaker condition that the derivative $\frac{\partial \pi_-(\alpha)}{\partial \alpha}$ is greater than -1. We assume the stronger condition because it yields more straightforward comparative static results in Propositions 3 and 4 below. Both sufficient conditions are easy to satisfy and we assume sufficiently large σ or σ_a (we could also assume particular distributions of $F(\delta)$).

The critical values $\bar{\alpha}$ and $\bar{\delta}$ determine the distribution of commoners between national and alternative identifiers. They are important in determining the choices made by elite decision makers. Therefore, how different variables affect $\bar{\alpha}$ and $\bar{\delta}$ are shown next.

Proposition 3: *For sufficiently positive σ* or *σ_a the share of commoners who retain the alternative identity $\bar{\alpha}$ is*:

(i) *decreasing in the national status* (σ);

(ii) *increasing in the level of rents* (T)*, in the elites' cost of suppression* (c)*, and in both the degree of collective organization* (ϕ) *and status* (σ_a) *of the alternative identity*;

(iii) *a differentiable function of* g *and* g_- *such that* $\frac{\partial \bar{\alpha}}{\partial g} > 0$ $\frac{\partial \bar{\alpha}}{\partial g_-} < 0$.

Proof. Consider the difference between the two payoffs (of the national and alternative identity) for commoners such that it is 0 at $\bar{\alpha}$ and $\bar{\delta}$:

$$\pi_-(\bar{\alpha}) = G^\gamma \left(1 + \sigma + \frac{\sigma\beta R}{1-\bar{\alpha}}\right) - \frac{g}{\beta R + 1 - \bar{\alpha}} + \sigma_n - \delta - (\frac{c\phi}{1+c\phi})^2 \phi A(\frac{T}{\bar{\alpha}} + 1](1+\sigma_a) = 0. \quad (21)$$

By implicit differentiation, for $x = \sigma, g, g_-, c, T, \phi$, and σ_a we have:

$$\frac{\partial \bar{\alpha}}{\partial x} = -\frac{\frac{\partial \pi_-(\bar{\alpha})}{\partial x}}{\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha}}.$$

With $\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha} > 0$ (see proof of Lemma 1, under sufficiently positive σ or σ_a), $\frac{\partial \bar{\alpha}}{\partial x}$ is negative if and only if $\frac{\partial \pi_-(\bar{\alpha})}{\partial x} > 0$. The results reported in the Proposition follow straightforwardly by differentiating $\pi_-(\bar{\alpha})$ with respect to $x = \sigma, \phi, T, c$, and σ_a. For $x = g$, note that:

$$\frac{\partial \pi_-(\bar{\alpha})}{\partial g} = -\frac{1}{\beta R + 1 - \bar{\alpha}},$$

and therefore

$$\frac{\partial \bar{\alpha}}{\partial g} = -\frac{\frac{\partial \pi_-(\bar{\alpha})}{\partial g}}{\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha}} > 0,$$

whereas for $x = g_-$, note that $G = (1-d)G_- + g_-$ and

$$\frac{\partial \pi_-(\bar{\alpha})}{\partial g_-} = \gamma G^{\gamma-1}\left(1 + \sigma + \frac{\sigma\beta R}{1-\bar{\alpha}}\right) > 0,$$

and therefore

$$\frac{\partial \bar{\alpha}}{\partial g_-} = -\frac{\frac{\partial \pi_-(\bar{\alpha})}{\partial g}}{\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha}} < 0.$$

□

Since $\bar{\delta}$ is decreasing in $\bar{\alpha}$, the reverse effects of those reported in Lemma 1 hold for $\bar{\delta}$.

On Fiscal Choices

We first reproduce (15), the elites' problem under fiscal restraints:

$$\begin{aligned}\max_{g_t} \tilde{\pi}_e^t = {G_t}^\gamma[\beta R + \sigma(\beta R + 1 - \bar{\alpha}_t)] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_t) - \frac{\beta R}{\beta R + 1 - \bar{\alpha}_t} g_t \\ + {G_{t+1}}^\gamma[\beta R + \sigma(R + 1 - \bar{\alpha}_{t+1})] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_{t+1}] - \frac{\beta R}{\beta R + 1 - \bar{a}_{t+1}} g_{t+1}.\end{aligned}$$

To derive a steady state choice of investments in the public good, we need to understand the incentives for investing and consider the derivative of the objective function with respect to g_t:

$$\frac{\partial \tilde{\pi}_e^t}{\partial g_t} = \gamma G_{t+1}^{\gamma-1}[\beta R + \sigma(\beta R + 1 - \bar{\alpha}_{t+1})] - \frac{\beta R}{\beta R + 1 - \bar{\alpha}_t} - D_t \frac{\partial \bar{\alpha}_t}{\partial g_t} - D_{t+1} \frac{\partial \bar{\alpha}_{t+1}}{\partial g_t},$$

where $D_t \equiv \sigma G_t^{\gamma} - \frac{A}{(1+c\phi)^2} + \frac{\beta R}{(\beta R+1-\bar{\alpha}_t)^2} g_t$.

Since we are interested in deriving an optimal steady state investment, consider the derivative when $g = dG$:

$$\frac{\partial \tilde{\pi}_e}{\partial g} = \gamma G^{\gamma-1}[\beta R + \sigma(\beta R + 1 - \bar{\alpha}(g_-))] - \frac{\beta R}{\beta R + 1 - \bar{\alpha}(g)} - D(\frac{\partial \bar{\alpha}}{\partial g} + \frac{\partial \bar{\alpha}}{\partial g_-} \mid_{g_-=g}). \tag{22}$$

where $\bar{\alpha}(g_-)$ and $\bar{\alpha}(g)$ are the effects of g on the next period and current period, respectively, described in Proposition 3.

The first term of (22) is the marginal benefit of the public good on the elites' income and on the national status; for any given G it is higher than the one that we derived in (9) by $\sigma(1-\bar{\alpha})$, which is the part of national income status that comes from the commoners who are national identifiers. The second term is the marginal cost of the public good—it is lower than in (9) because the cost of the public good to the elites is now shared with the commoners who identify with the nation. Thus, both these two components favor higher investments in the public good than in the absence of fiscal restraints. If the other terms did not exist, the optimal steady state level of the public good would be:

$$G_o \equiv [\gamma \left(1 + \sigma + \frac{\sigma(1-\bar{\alpha})}{\beta R}\right)(\beta R + 1 - \bar{\alpha})]^{\frac{1}{1-\gamma}}.$$

That would be the optimal level for the elites if the last term two terms of (22) were to cancel each other out—they represent the effect that g_t has on the number of commoners who become alternative versus national identifiers in periods $\neg t$ and $t+1$. As we can see from Proposition 3(iii), $\frac{\partial \bar{\alpha}}{\partial g}$ and $\frac{\partial \bar{\alpha}}{\partial g_-}$ have opposite signs, as investment today reduces the number of commoners who become national identifiers (because it increases taxation) but it increases those of the next period (because it increases next period's income). Overall, however, there is one important benchmark fixed level of the public good (and the associated investment at a steady state level) according to which $\frac{\partial \bar{\alpha}}{\partial g} + \frac{\partial \bar{\alpha}}{\partial g_-} \mid_{g_-=g} = 0$, which would be:

$$G_{\bar{\alpha}} \equiv [\gamma \left(1 + \sigma + \frac{\sigma \beta R}{1-\bar{\alpha}}\right)(\beta R + 1 - \bar{\alpha})]^{\frac{1}{1-\gamma}}.$$

Note that $G_o < G_{\bar{\alpha}}$ if and only if $1 - \bar{\alpha} < \beta R$. Given that $G^* = [\gamma(1+\sigma+\sigma\zeta)(\beta R + 1 - \bar{\alpha}^*)]^{\frac{1}{1-\gamma}}$ for some $\zeta \in [\min\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}, \max\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}]$, we must also have $G^* \in [\min\{G_o, G_{\bar{\alpha}}\}, \max\{G_o, G_{\bar{\alpha}}\}]$. In Proposition 4, we show that G^* is between G_o and $G_{\bar{\alpha}}$, under the sufficient condition that $D \equiv \sigma G^{\gamma} - \frac{A}{(1+c\phi)^2} + \frac{\beta R}{(\beta R+1-\bar{\alpha}^*)^2} g > 0$ for $G \geq \min\{G_o, G_{\bar{\alpha}}\}$. The three components of D represent the marginal effects on the elites' payoff of changes in the number of commoners who identify with the nation. One component increases the elites' status (σG^{γ}), another reduces the cost of the public good ($\frac{\beta R}{(\beta R+1-\bar{\alpha})^2} g$), but a third ($-\frac{A}{(1+c\phi)^2}$) reduces the (contested) income received from the commoners who adhere to the alternative identity. Thus, $D > 0$ when, among other factors, the national status parameter (σ) is high enough and the elites' marginal return to contested income is low enough. In that case, as we shall see below, elites benefit from having fiscal restraints so that they are able to attract commoners to the nation. Otherwise, with $D < 0$, it is unclear that it is to the benefit of the elites to have such fiscal restraints (though this is not an excludable possibility).

Proposition 4: *Consider elite maximization in the presence of fiscal restraints, such that taxes solely finance public good investment. When national status (σ) or total elite resources (βR) are high enough or the marginal return on insecure income by the elites ($\frac{A}{(1-c\phi)^2}$) is low enough,*

(i) *The steady state level of public good is G^* in (16), where $G^* > G_e$, the steady state level of public good in the absence of restraints in (11);*

(ii) *The steady state payoff of the elites $\tilde{\pi}_e^*$ is higher than π_e^e, the payoff in the absence of fiscal restraints;*

(iii) *A positive number of commoners* $1-\bar{\alpha}^*$ *identify with the nation. That number is increasing in national status* (σ) *and is decreasing in the value of rents* (T)*, in the elites' cost of suppression* (c)*, and in both the degree of collective organization* (ϕ) *and status* (σ_a) *of the alternative identity.*

Proof. Part *(i)*: Suppose that $\frac{A}{(1-c\phi)^2}$ is sufficiently low such that $D \equiv \sigma G^{\gamma} - \frac{A}{(1+c\phi)^2} + \frac{\beta R}{(\beta R+1-\bar{\alpha}^*)^2} g > 0$ for $G \geq \min\{G_o, G_{\bar{a}}\}$. Suppose $\min\{G_o, G_{\bar{a}}\} = G_o$ and evaluate (22) at a fixed G_o. Then, since this is how G_o is defined, the sum of the first two terms in (22) is zero. Moreover, since by supposition $G_o \leq G_{\bar{a}}$, by Proposition 3 the last term $(-D(\frac{\partial \bar{\alpha}}{\partial g} + \frac{\partial \bar{\alpha}}{\partial g_-} \mid_{g_-=g}))$ is non-negative and the whole derivative is non-negative. Moreover, for all $G > G_{\bar{a}}$ by Proposition 3 $-D(\frac{\partial \bar{\alpha}}{\partial g} + \frac{\partial \bar{\alpha}}{\partial g_-} \mid_{g_-=g})$ becomes negative and the sum of the first two terms becomes negative as well (since, given $\gamma < 1$, $\gamma G^{\gamma-1}[\beta R + \sigma(\beta R + 1 - \bar{\alpha}_{t+1})]$ is decreasing in G and $-\frac{\beta R}{\beta R+1-\bar{\alpha}}$ is constant). Therefore, the whole derivative in (22) is negative for $G > G_{\bar{a}}$. It is also clear that the derivative is positive for $G < G_o$. Therefore, there must be a $G^* \in [G_o, G_{\bar{a}}]$ such the derivative in (22) is 0 with $g^* = dG^*$ being the optimal investment.

Next, suppose $\min\{G_o, G_{\bar{a}}\} = G_{\bar{a}}$ and evaluate (22) at $G_{\bar{a}}$. By the definition of $G_{\bar{a}}$, $-D(\frac{\partial \bar{\alpha}}{\partial g} + \frac{\partial \bar{\alpha}}{\partial g_-} \mid_{g_-=g})$ is 0, while the sum of the first two terms (and therefore the whole derivative at $G_{\bar{a}}$) must be non-negative (given $G_{\bar{a}} \leq G_o$). Moreover, for all $G > G_o$ the sum of the first two terms becomes negative while $-D(\frac{\partial \bar{\alpha}}{\partial g} + \frac{\partial \bar{\alpha}}{\partial g_-} \mid_{g_-=g})$ is negative as well (by Proposition 3) and the whole derivative is negative. It is also clear that the derivative is positive for $G < G_{\bar{a}}$. Therefore, there must be a $G^* = [\gamma(1+\sigma+\sigma\zeta)(\beta R+1-\bar{\alpha})]^{\frac{1}{1-\gamma}} \in [G_{\bar{a}}, G_o]$, where $\zeta \in [\min\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}, \max\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}]$, such that the derivative in (22) is 0 with $g^* = dG^*$ being the optimal investment.

Part *(ii)*: Straightforward calculations can show that

$$\tilde{\pi}_e^* = 2[\gamma(1+\sigma+\sigma\zeta)(\beta R+1-\bar{\alpha}^*)]^{\frac{\gamma}{1-\gamma}} \beta R[(1+\sigma)(1-d\gamma)+\sigma(\frac{1-\bar{\alpha}^*}{\beta R}-d\gamma\zeta)]+2\frac{A}{(1+c\phi)^2}(T+\bar{\alpha}^*)+2\beta R\sigma_n. \tag{23}$$

This equilibrium payoff needs to be compared to the equilibrium payoff in the absence of restraints in (13),

$$\pi_e^e = 2[\gamma(1+\sigma)]^{\frac{\gamma}{1-\gamma}} \beta R^{\frac{1}{1-\gamma}} (1-d\gamma)(1+\sigma) + 2\frac{A}{(1+c\phi)^2}(T+1) + 2\beta R\sigma_n.$$

The first term of $\tilde{\pi}_e^*$ is clearly higher than that of π_e^e given the parameters (they are positive functions of G^* and G_e, respectively, and $G^* > G_e$) while the third terms are identical. From the these expressions we can show that $\tilde{\pi}_e^* > \pi_e^e$ if and only if

$$E \equiv [(1+\sigma(1+\zeta))(\beta R+1-\bar{\alpha}^*)]^{\frac{1}{1-\gamma}} - [(1+\sigma)\beta R]^{\frac{1}{1-\gamma}} - \frac{\frac{A}{(1+c\phi)^2}(1-\bar{\alpha}^*)}{\gamma^{\frac{\gamma}{1-\gamma}}(1-d\gamma)} > 0. \tag{24}$$

Differentiating E in (24) with respect to σ, we obtain:

$$\frac{\partial E}{\partial \sigma} = \frac{1}{1-\gamma}[H^{\frac{\gamma}{1-\gamma}}(1+\zeta)(\beta R+1-\bar{\alpha}^*) - M^{\frac{\gamma}{1-\gamma}}\beta R] - \frac{\partial \bar{\alpha}^*}{\partial \sigma}[\frac{1}{1-\gamma}H^{\frac{\gamma}{1-\gamma}}(1+\sigma(1+\zeta)) - \frac{p^{*2}A}{\gamma^{\frac{\gamma}{1-\gamma}}(1-d\gamma)}],$$

where $H \equiv [(1+\sigma(1+\zeta))(\beta R+1-\bar{\alpha}^*)]^{\frac{1}{1-\gamma}}$ and $M \equiv [(1+\sigma)\beta R]^{\frac{1}{1-\gamma}}$. Given that $H > M$, the first term in this derivative is positive. By Proposition 3(i), $\frac{\partial \bar{\alpha}^*}{\partial \sigma} < 0$ and, therefore, the second term is positive if the term inside its brackets is positive. H involves terms from G^* (which is greater than G_e, from which the terms in M are derived) whereas we have assumed A to be low enough (equal to $\bar{G}^{\gamma}$ for some $\bar{G}$ that is assumed to be lower than G_e). Therefore, for A low enough, $\frac{\partial E}{\partial \sigma}$ is positive. Moreover, also for A low enough, there is a σ $(\sigma_{\min})$ such that the value of E is zero and, given the monotonicity of E in σ, E would be positive for all $\sigma > \sigma_{\min}$. We would then have $\tilde{\pi}_e^* > \pi_e^e$ for $\sigma > \sigma_{\min}$.

Part *(iii)*: For sufficiently high σ and βR and low enough $\frac{A}{(1-c\phi)^2}$, $\pi_{nc_\delta}(1) > \pi_{ac_\delta}(1)$ and, therefore, there must exist $\bar{\alpha}^* < 0$ (and $1- \bar{\alpha}^* > 0$) such that $\pi_{nc_\delta}(\bar{\alpha}^*) = \pi_{ac_\delta}(\bar{\alpha}^*)$. The remaining properties follow from the corresponding properties in Proposition 3. □

Investing in National Identification and its Interaction with Public Good Provision

In order to examine the case of endogenous σ in (17), we next show a version (and generalization) of Proposition 3*(iii)* that allows for investments in both the public good and national identity:

Proposition 3*: *For $\bar{\alpha} \in (0, 1)$, the share of commoners who retain the alternative identity is*

(i) *a differentiable function of g and g_- such that $\frac{\partial \bar{\alpha}}{\partial g} > 0$ $\frac{\partial \bar{\alpha}}{\partial g_-} < 0$, and*

(ii) *a differentiable function of s and s_- such that $\frac{\partial \bar{\alpha}}{\partial s} > 0$ $\frac{\partial \bar{\alpha}}{\partial s_-} < 0$.*

Proof. Consider the following variation of (21) from the proof of Proposition 3:

$$\pi_-(\bar{\alpha}) = G^\gamma \left(1 + \psi S^\chi \frac{1 - \bar{\alpha} + \beta R}{1 - \bar{\alpha}}\right) - \frac{g + s}{\beta R + 1 - \bar{\alpha}} + \sigma_n - \delta - (\frac{c\phi}{1 + c\phi})^2 \phi A(\frac{T}{\bar{\alpha}} + 1](1 + \sigma_a) = 0.$$

Again, by implicit differentiation, for $x = g, g_-, s, s_-, c, T, \phi$, and σ_a we have

$$\frac{\partial \bar{\alpha}}{\partial x} = -\frac{\frac{\partial \pi_-(\bar{\alpha})}{\partial x}}{\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha}}.$$

With $\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha} > 0$ (see proof of Lemma 1), $\frac{\partial \bar{\alpha}}{\partial x}$ is negative if and only if $\frac{\partial \pi_-(\bar{\alpha})}{\partial x} > 0$. Part *(i)* follows the same proof as that of part *(iii)* of Proposition 3.

For part *(ii)* and $x = s$, we similarly have

$$\frac{\partial \pi_-(\bar{\alpha})}{\partial s} = -\frac{1}{\beta R + 1 - \bar{\alpha}},$$

and therefore

$$\frac{\partial \bar{\alpha}}{\partial s} = -\frac{\frac{\partial \pi_-(\bar{\alpha})}{\partial s}}{\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha}} > 0.$$

For $x = s_-$, note that $S = s_- + (1 - d)S_-$ and

$$\frac{\partial \pi_-(\bar{\alpha})}{\partial s_-} = G^\gamma \chi \psi S^{\chi - 1} \frac{1 - \bar{\alpha} + \beta R}{1 - \bar{\alpha}} > 0,$$

and therefore

$$\frac{\partial \bar{\alpha}}{\partial s_-} = -\frac{\frac{\partial \pi_-(\bar{\alpha})}{\partial s_-}}{\frac{\partial \pi_-(\bar{\alpha})}{\partial \alpha}} < 0.$$

□

Investing in National Identity and the Public Good Under Fiscal Restraints

Under fiscal restraints (so that $g_t + s_t = \tau_t G_t^{\gamma}(\beta R + 1 - \alpha_t)$), the elites' problem becomes:

$$\max_{g_t, s_t} \tilde{\pi}_e^t = G_t{}^{\gamma}[\beta R + \psi S_t{}^{\chi}(\beta R + 1 - \bar{\alpha}_t)] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_t) - \frac{\beta R}{\beta R + 1 - \bar{\alpha}_t}(g_t + s_t) \tag{25}$$
$$+ G_{t+1}{}^{\gamma}[\beta R + \psi S_{t+1}{}^{\chi}(\beta R + 1 - \bar{\alpha}_{t+1})] + (\frac{1}{1+c\phi})^2 A(T + \bar{a}_{t+1}] - \frac{\beta R}{\beta R + 1 - \bar{a}_{t+1}}(g_{t+1} + s_{t+1}).$$

We proceed analogously to the build-up of Proposition 4 earlier in the Appendix. Before deriving the steady-state choices, consider the incentives for investing in g_t and s_t by differentiating the objective function in (25):

$$\frac{\partial \tilde{\pi}_e^t}{\partial g_t} = \gamma G_{t+1}^{\gamma-1}[\beta R + \psi S_t{}^{\chi}(\beta R + 1 - \bar{\alpha}_{t+1})] - \frac{\beta R}{\beta R + 1 - \bar{\alpha}_t} - D_t' \frac{\partial \bar{\alpha}_t}{\partial g_t} - D_{t+1}' \frac{\partial \bar{\alpha}_{t+1}}{\partial g_t}$$
$$\frac{\partial \tilde{\pi}_e^t}{\partial s_t} = G_{t+1}^{\gamma} \psi \chi S_t{}^{\chi-1}(\beta R + 1 - \bar{\alpha}_{t+1})] - \frac{\beta R}{\beta R + 1 - \bar{\alpha}_t} - D_t' \frac{\partial \bar{\alpha}_t}{\partial s_t} - D_{t+1}' \frac{\partial \bar{\alpha}_{t+1}}{\partial s_t},$$

where $D_t' \equiv G_t^{\gamma} \psi S_t{}^{\chi} - \frac{A}{(1+c\phi)^2} + \frac{\beta R}{(\beta R + 1 - \bar{\alpha}_t)^2}(g_t + s_t)$.

Since we are interested in deriving an optimal steady state investment, whereby the young elite inherits a G and S such that its own $g = dG, s = dS$, and the future young elite will also invest the same g and s, the relevant derivatives become as follows:

$$\frac{\partial \tilde{\pi}_e}{\partial g} = \gamma G^{\gamma-1}[\beta R + \psi S^{\chi}(\beta R + 1 - \bar{\alpha}(g_-))] - \frac{\beta R}{\beta R + 1 - \bar{\alpha}(g)} - D'(\frac{\partial \bar{\alpha}}{\partial g} + \frac{\partial \bar{\alpha}}{\partial g_-} \mid_{g_- = g}) \tag{26}$$
$$\frac{\partial \tilde{\pi}_e}{\partial s} = G^{\gamma} \psi \chi S^{\chi-1}(\beta R + 1 - \bar{\alpha}(s_-))] - \frac{\beta R}{\beta R + 1 - \bar{\alpha}(s)} - D'(\frac{\partial \bar{\alpha}}{\partial s} + \frac{\partial \bar{\alpha}}{\partial s_-} \mid_{s_- = s}).$$

where $\bar{\alpha}(g_-)$ and $\bar{\alpha}(g)$ are the effect of g, respectively, (and similarly for $\bar{\alpha}(s_-)$ and $\bar{\alpha}(s)$) on the next period and current period described in Proposition 3*. The two derivatives (26) have similar interpretations to that of (22) above.

Just as G^* in Proposition 4 was shown to be between G_o and $G_{\bar{\alpha}}$, we will show that the optimal steady state levels of the public good and national identity, $\hat{G}$ and $\hat{S}$, are between G_o' and $G_{\bar{\alpha}}'$ and S_o' and $S_{\bar{\alpha}}'$, respectively. In particular,

$$G_o' \equiv [\gamma \left(1 + \psi \hat{S}^{\chi}(1 + \frac{1 - \bar{\alpha}}{\beta R})\right)(\beta R + 1 - \bar{\alpha})]^{\frac{1}{1-\gamma}} \tag{27}$$
$$G_{\bar{\alpha}}' \equiv [\gamma \left(1 + \psi \hat{S}^{\chi}(1 + \frac{\beta R}{1 - \bar{\alpha}})\right)(\beta R + 1 - \bar{\alpha})]^{\frac{1}{1-\gamma}}$$
$$S_o' \equiv [\chi \psi \hat{G}^{\gamma} \frac{1}{\beta R}(\beta R + 1 - \bar{\alpha})^2]^{\frac{1}{1-\chi}}$$
$$S_{\bar{\alpha}}' \equiv [\chi \psi \hat{G}^{\gamma} \frac{1}{1 - \bar{\alpha}}(\beta R + 1 - \bar{\alpha})^2]^{\frac{1}{1-\chi}}.$$

Note that $G_o' < G_{\bar{\alpha}}'$ and $S_o' < S_{\bar{\alpha}}'$ if and only if $1 - \bar{\alpha} < \beta R$.

Given that $G^* = [\gamma\,(1 + \sigma + \sigma\zeta)\,(\beta R + 1 - \bar{\alpha}^*)]^{\frac{1}{1-\gamma}}$ for some $\zeta \in [\min\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}, \max\{\frac{(1-\bar{\alpha})}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}]$, we must also have $G^* \in [\min\{G_o, G_{\bar{\alpha}}\}, \max\{G_o, G_{\bar{\alpha}}\}]$. In Proposition 4, we show that G^* is between G_o and $G_{\bar{\alpha}}$, under the sufficient condition that $D \equiv \sigma G^{\gamma} - \frac{A}{(1+c\phi)^2} + \frac{\beta R}{(\beta R + 1 - \bar{\alpha}^*)^2} g > 0$ for $G \geq \min\{G_o, G_{\bar{\alpha}}\}$. The three components of D represent the marginal effects on the elites' payoff of

changes in the number of commoners who identify with the nation. One component increases the elites' status (σG^{γ}), another reduces the cost of the public good ($\frac{\beta R}{(\beta R+1-\bar{\alpha})^2}g$), but a third reduces ($-\frac{A}{(1+c\phi)^2}$) reduces the (contested) income received from the commoners who adhere to the alternative identity. Thus, $D > 0$ when, among other factors, the national status parameter (σ) is high enough and the elites' marginal return to contested income is low enough. In that case, as we shall see below, elites benefit by having fiscal restraints so that they can attract commoners to the nation. Otherwise, with $D < 0$, it is unclear that it is to the benefit of the elites to have such fiscal restraints.

Proposition 5: *Consider elite maximization in the presence of sufficient political restraints, such that taxes are invested solely in the public good and in national identity. Suppose the marginal return on insecure income by the elites* ($\frac{A}{(1-c\phi)^2}$) *is sufficiently low. Then:*

(i) *The steady state levels of public good $\hat{G}$ and of investments in national identity $\hat{S}$ can be obtained from the following:*

$$\hat{G} = [\gamma\left(1+\psi\hat{S}^{\chi}(1+\eta)\right)(\beta R+1-\bar{\alpha})]^{\frac{1}{1-\gamma}},$$
$$\hat{S} = [\chi\psi\hat{G}^{\gamma}\theta(\beta R+1-\bar{\alpha})^2]^{\frac{1}{1-\chi}},$$

for some $\eta \in [\min\{\frac{1-\bar{\alpha}}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}, \max\{\frac{1-\bar{\alpha}}{\beta R}, \frac{\beta R}{1-\bar{\alpha}}\}]$ and $\theta \in [\min\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}, \max\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}]$.

(ii) *A positive number of commoners $1-\bar{\alpha}$ identify with the nation. That number is increasing in the relative status parameter σ_n; and decreasing in the value of rents (T), the elites' cost of suppression (c), and the collective organization (ϕ) and status (σ_a) of the alternative identity.*

Proof. Part *(i)*: Suppose $\frac{A}{(1-c\phi)^2}$ is sufficiently low such that $D \equiv \psi S^{\chi}G^{\gamma} - \frac{A}{(1+c\phi)^2} + \frac{\beta R}{(\beta R+1-\bar{\alpha})^2}(g+s) > 0$ for $G \geq \min\{G'_o, G'_{\bar{\alpha}}\}$ and $S \geq \min\{S'_o, S'_{\bar{\alpha}}\}$. The rest of the proof follows similarly to that part (i) of Proposition 4 and, to avoid unnecessary repetition, we will show how $\hat{S}$ is derived only.

First, suppose $1-\bar{\alpha} > \beta R$ so that $\min\{S'_o, S'_{\bar{\alpha}}\} = S'_{\bar{\alpha}}$ and evaluate $\frac{\partial\tilde{\pi}_e}{\partial s}$ in (26) at the fixed $S'_{\bar{\alpha}}$. Then, since this is how S'_o is defined, the sum of the first two terms of $\frac{\partial\tilde{\pi}_e}{\partial s}$ in (26) (and evaluated at $G = \hat{G}$) is zero. Moreover, since by supposition $S'_o \leq S'_{\bar{\alpha}}$, by Proposition 3* the last term (i.e.,$-D'(\frac{\partial\bar{\alpha}}{\partial s} + \frac{\partial\bar{\alpha}}{\partial s_-}\mid_{s_-=s}$)) is non-negative and the whole derivative is non-negative. Moreover, for all $S > S'_{\bar{\alpha}}$ by Proposition 3* $-D'(\frac{\partial\bar{\alpha}}{\partial s} + \frac{\partial\bar{\alpha}}{\partial s_-}\mid_{s_-=s})$ becomes negative and the sum of the first two terms becomes negative as well (since, given $\chi < 1$, $G^{\gamma}\psi\chi S^{\chi-1}(\beta R+1-\bar{\alpha}(s_-))]$ is decreasing in S and $-\frac{\beta R}{\beta R+1-\bar{\alpha}}$ is constant). Therefore, the whole derivative in (26) is negative for $S > S'_{\bar{\alpha}}$. It is also clear that the derivative is positive for $S < S'_o$. Therefore, there must be a $\hat{S} = [\chi\psi\hat{G}^{\gamma}\theta(\beta R+1-\bar{\alpha})^2]^{\frac{1}{1-\chi}} \in [S'_o, S'_{\bar{\alpha}}]$ for some $\theta \in [\min\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}, \max\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}]$ such as the derivative in (26) is 0 with $\hat{s} = d\hat{S}$ being the optimal investment.

Next, suppose $1-\bar{\alpha} > \beta R$ so that $\min\{S'_o, S'_{\bar{\alpha}}\} =$ and evaluate $\frac{\partial\tilde{\pi}_e}{\partial s}$ in (26) at the fixed S'_o. Note that $-D'(\frac{\partial\bar{\alpha}}{\partial s} + \frac{\partial\bar{\alpha}}{\partial s_-}\mid_{s_-=s}) = 0$ by the definition of $S'_{\bar{\alpha}}$, whereas, given that by supposition $S'_{\bar{\alpha}} < S'_o$, the sum of the first two terms $\frac{\partial\tilde{\pi}_e}{\partial s}$ must be non-negative and, therefore, the whole derivative is non-negative at $S'_{\bar{\alpha}}$. Moreover, for all $S > S'_o$ the sum of the first two terms becomes negative while $-D'(\frac{\partial\bar{\alpha}}{\partial s} + \frac{\partial\bar{\alpha}}{\partial s_-}\mid_{s_-=s})$ is negative as well (by Proposition 3*) and the whole derivative is negative. It is also clear that the derivative is positive for $S < S'_{\bar{\alpha}}$.Therefore, there must be a $\hat{S} = [\chi\psi\hat{G}^{\gamma}\theta(\beta R+1-\bar{\alpha})^2]^{\frac{1}{1-\chi}} \in [S'_o, S'_{\bar{\alpha}}]$ for some $\theta \in [\min\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}, \max\{\frac{1}{\beta R}, \frac{1}{1-\bar{\alpha}}\}]$ such that the derivative in (26) is 0, with $\hat{s} = d\hat{S}$ being the optimal investment.

Part *(ii)*: For sufficiently low $\frac{A}{(1-c\phi)^2}$, $\pi_{nc_\delta}(1) > \pi_{ac_\delta}(1)$, and therefore there must exist $\bar{\alpha} < 0$ (and $1-\bar{\alpha} > 0$) such that $\pi_{nc_\delta}(\bar{\alpha}) = \pi_{ac_\delta}(\bar{\alpha})$. The remaining properties follow from the corresponding properties in Proposition 3*. □

Online Appendix

A Additional Empirical Results

Table A.1: Using Alternative Standard Errors for Tables 2 and 3

Dependent variable:	Real GDP per capita (1)	Government expenditures per capita (2)	Public education expenditures per capita (3)	Military expenditures per capita (4)	Residual expenditures per capita (5)
Baseline estimate	782.927***	277.791***	157.254***	4.195	299.724**
	(229.150)	(104.109)	(52.188)	(9.128)	(124.631)
1. Conley (1999) w/ 1000 km and 1 year lag	(175.639)	(75.708)	(39.437)	(7.251)	(97.274)
2. Conley (1999) w/ 1000 km and 30 year lag	(274.912)	(121.648)	(61.127)	(10.888)	(144.165)
3. Conley (1999) w/ 500 km and 10 year lag	(224.433)	(97.534)	(50.438)	(9.240)	(117.182)
4. Conley (1999) w/ 2500 km and 10 year lag	(225.660)	(101.302)	(52.904)	(8.801)	(119.459)
5. Conley (1999) w/ 2500 km and 30 year lag	(272.010)	(119.254)	(61.740)	(10.616)	(139.719)
6. Clustering by country	(349.876)	(149.040)	(75.895)	(14.019)	(170.858)
7. Two-way cluster by country and year	(345.535)	(159.773)	(79.778)	(14.008)	(175.979)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Institutions $\times$ year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,223	2,149	1,349	2,154	1,269
Adj. R^2	0.22	0.26	0.27	0.08	0.30

Note: Regressions of real GDP per capita (column 1) and government final consumption expenditures per capita (columns 2–5) on NI scores from 1981 through 2012. All regressions include country FE as well as year FE interacted with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Standard errors based on the Conley (1999) spatial HAC with various bandwidths and time lags (rows 1–5), clustered by country (row 6), and two-way clustered by country and year (row 7) reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.2: Using Extended Country Sample for Tables 2 and 3

Dependent variable:	Real GDP per capita	Government expenditures per capita	Public education expenditures per capita	Military expenditures per capita	Residual expenditures per capita
	(1)	(2)	(3)	(4)	(5)
National identity score	579.430***	260.052***	134.129***	4.273	287.733***
	(158.664)	(77.459)	(38.360)	(6.645)	(101.532)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Institutions × year FE	Yes	Yes	Yes	Yes	Yes
Observations	3,278	3,096	1,845	3,026	1,682
Adj. R^2	0.24	0.25	0.28	0.09	0.32

Note: Regressions of real GDP per capita (column 1) and government final consumption expenditures per capita (columns 2–5) on NI scores from 1981 through 2012. All regressions include country FE as well as year FE interacted with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3: Using Alternative LASSO Outputs for Tables 2 and 3

Dependent variable:	Real GDP per capita	Government expenditures per capita	Public education expenditures per capita	Military expenditures per capita	Residual expenditures per capita
	(1)	(2)	(3)	(4)	(5)
	(a) *Based on Alternative Pride Indicator*				
National identity score	556.673***	201.380**	138.886***	6.504	205.349**
	(211.589)	(88.871)	(42.915)	(6.282)	(87.140)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Institutions × year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,223	2,149	1,349	2,154	1,269
Adj. R^2	0.22	0.26	0.28	0.08	0.30
	(b) *Based on Flexible LASSO Inputs*				
National identity score	642.879**	197.492*	147.184**	-13.963	206.335
	(278.790)	(113.552)	(60.020)	(18.588)	(143.245)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Institutions × year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,223	2,149	1,349	2,154	1,269
Adj. R^2	0.22	0.26	0.26	0.08	0.29

Note: Regressions of real GDP per capita (column 1) and government final consumption expenditures per capita (columns 2–5) on NI scores from 1981 through 2012. Panel (a) uses NI scores predicted from LASSO regressions using an alternative pride indicator in equation (19), as described in footnote 27. Panel (b) uses NI scores predicted from LASSO regressions with quadratic transformations of all country-level predictors included among the set of model inputs. All regressions include country FE as well as year FE interacted with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

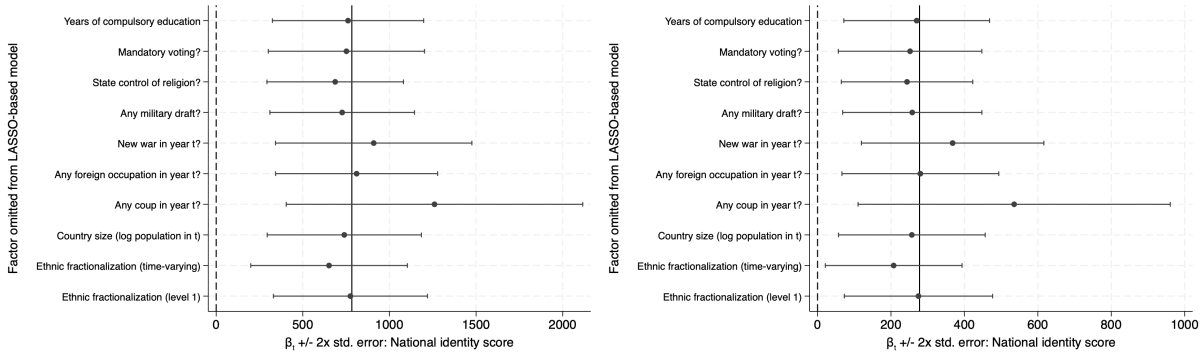
Table A.4: Using Alternative Institutions Measure for Table 4

Dependent variable:	Real GDP per capita					Government consumption expenditures per capita				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
NI score	-377.882***	-217.399*	-229.107*	-422.552***	-483.116***	-116.747***	-70.734*	-57.071	-150.361***	-161.102***
	(96.185)	(124.897)	(120.888)	(118.699)	(128.495)	(32.864)	(41.159)	(41.465)	(46.191)	(48.518)
NI × Political stability	2190.407***				1589.717***	774.035***				569.116**
	(661.444)				(523.086)	(289.389)				(233.423)
NI × Accountability		1252.645**			-104.340		566.636**			-31.265
		(557.503)			(317.870)		(254.972)			(156.263)
NI × Rule of law			1650.492***		-360.867			555.002**		-239.081
			(637.302)		(450.204)			(260.081)		(158.498)
NI × Control of corruption				2054.602***	1275.862**				759.210***	547.373**
				(590.465)	(573.653)				(257.461)	(252.249)
Total interaction coeff. p-value					0.002					0.008
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institutions × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,223	2,223	2,223	2,223	2,223	2,149	2,149	2,149	2,149	2,149
Adj. R^2	0.45	0.44	0.44	0.45	0.45	0.39	0.39	0.39	0.39	0.40

Note: Regressions of real GDP per capita (columns 1–5) and government final consumption expenditures per capita (columns 6–10) on NI scores from 1981 through 2012. All columns interact NI scores with various institutions indicators, which equal 1 if a country's mean score across its sample period for a given WGI measure is above the sample median, and report estimates for each subgroup, with p-values for aggregate interaction effects at the bottom of columns 5 and 10. All regressions include country FE and institutions×year FE. Standard errors clustered at the country level in parentheses. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure A.1: Sensitivity to Country-level Factors: "Leave One Out" Exercise

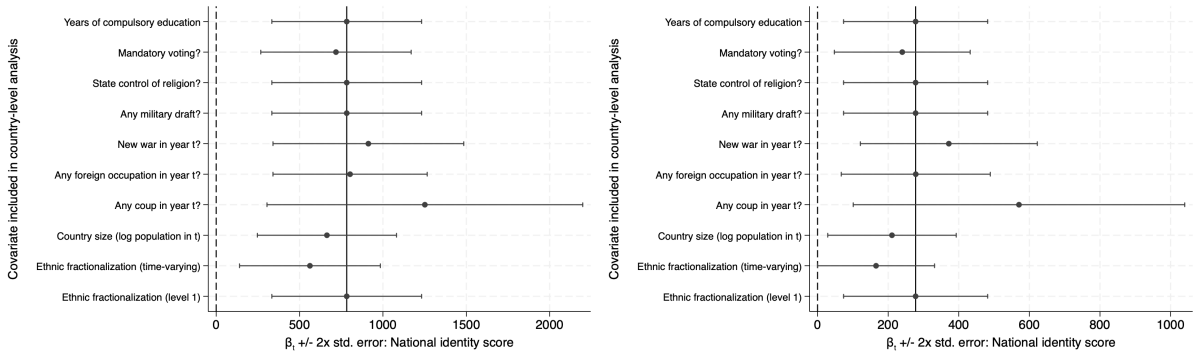
(a) Real GDP per Capita **(b)** Governments Expenditures per Capita



Notes: Plots show changes how estimates in columns 2 of Table 2 (panel a) and Table 3 (panel b) vary with the use of alternative NI scores, leaving country-level factors out one-by-one. Baseline coefficients demarcated by the solid lines. All regressions include country FE as well as year FE interacted with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure A.2: Sensitivity to Country-level Factors: Controlling for LASSO Predictors

(a) Real GDP per Capita **(b)** Governments Expenditures per Capita



Notes: Plots show changes how estimates in columns 2 of Table 2 (panel a) and Table 3 (panel b) vary with the inclusion of our country-level factors as covariates. Baseline coefficients demarcated by the solid lines. All regressions include country FE as well as year FE interacted with an institutions indicator, which equals 1 if a country's mean Polity2 score across its sample period is above the sample median. Standard errors based on the Conley (1999) spatial HAC with a bandwidth of 1000 km and time lag of 10 years reported in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.