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Abstract

Why do some societies fail to adopt more efficient institutions? And why do such failures often coincide with cultural movements that glorify the past? We propose a model highlighting the interplay—or lack thereof—between institutional change and cultural beliefs. The main insight is that institutional change by itself will not lead to a more efficient economy unless culture evolves in tandem. This is because institutional change can be countered by changes in cultural values complementary to a more "traditional" economy. In our model, forward-looking elites, who benefit from a traditional, inefficient economy, may over-provide public goods that are complementary to the production of traditional goods. This encourages individuals to transmit cultural beliefs complementary to the provision of traditional goods. A horse race results between institutions, which evolve towards a more efficient (less traditional) economy, and cultural norms, which are pulled towards "tradition" by the elites. When culture wins the horse race, institutions respond by giving more political power to traditional elites—even if in doing so more efficient institutions are left behind. We call the interaction between these cultural and institutional dynamics a *cultural revival*.

Keywords: institutions, cultural beliefs, cultural transmission, institutional change

JEL codes: D02, N40, N70, O33, O38, O43, Z10.

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1 Introduction

Why do some societies fail to adopt more efficient institutions? Why do institutional changes towards a more productive economy sometimes stop dead in their tracks, igniting a reversal in the opposite direction? History is replete with instances of societies turning their backs on more efficient economic outcomes. For instance, Chaney (2016) studies the decline of Islamic science, finding that the decline began in the 12th and 13th centuries and that scientific learning was replaced by more traditional modes of religious education in madrasas. Squicciarini (2019) finds that the Catholic Church promoted a highly anti-scientific school curriculum in the late-19th century, just as the returns to secular education were rising in the midst of the Second Industrial Revolution. Carvalho and Koyama (2016) and Carvalho, Koyama and Sacks (2017) find that ultra-Orthodox European Jews responded to emancipation in the 19th century by imposing unprecedented restrictions on secular education, further closing themselves off from society.

These examples highlight a curious, yet ubiquitous phenomenon: the rejection of institutional change is frequently coupled with a *cultural revival* of traditional values. We conceptualize cultural revivals as movements in which the dominant cultural norms shift from those that are complementary with highly productive economic activity (given the state of technology) to those that complement less productive economic activity. Cultural revivals may occur *in spite of* institutional change favoring a more efficient economy. They may, in fact, induce institutional regression towards a less efficient economy.

Macro-level examples of cultural revivals abound in the historical record. They include the famed "social decay" of the late Roman Empire, the inward turns of Qing China and Shogunate Japan in response to contact with Europe, and British unpreparedness for World War I. These examples are all reflective of societies built on cultural beliefs associated with past glory but ill-suited for a much changed world.[1]

[1] More generally, Boyd and Richerson (1985, p. 40) note that "historians, sociologists, and anthropologists have found a number of striking examples of cultural inertia, situations in which cultural ancestry is important in changed situations or where traditional cultural differences persist in similar environments."

In this paper, we present a theory to explain why such cultural and institutional reversals arise. Our main insight is that cultural values conducive to economic growth may fail to develop if "traditional" elites anticipate losing their political power as a result. The reason is that these traditional elites use their political power to over-provide public goods that benefit citizens with traditional cultural values. This encourages traditional cultural values to spread throughout the population, which in turn encourages institutional change toward a less efficient economy. The model therefore reveals how self-interested elites can set in motion—via indoctrination—institutional changes that favor their interests *despite* the fact that they have no capacity to directly alter institutions.[2] Moreover, traditional elites have even greater incentive to set in motion a cultural revival after a shock which increases the efficiency of the other sector in the economy. Thus, our model reveals how positive, exogenous economic or technological shocks may end up *negatively* impacting economic development.

In our model, elites provide public goods that complement production by civil society. These public goods are subject to an externality, which arises because elites and civil society have preferences that are not aligned, yet the choices of the former impinge on the decisions of the latter. We model institutional change as a slow process subject to frictions, uncertainties and shocks. However, to the extent that institutional change helps to internalize the aforementioned externality, it does so by redistributing political power to elites so that their preferences are more aligned with the cultural composition of society. Hence, a "horse race" can arise between institutions and culture. Institutions move towards a more efficient outcome on one trajectory, while forward-looking elites may use public good provision to indoctrinate civil society, pulling culture along the opposite trajectory. When culture wins the horse race, a cultural revival occurs, because both cultural values and (eventually) institutions associated with the traditional economy become predominant.[3]

[2]This logic is consistent with a large literature that views institutions as exogenous to all players at any given point in time but endogenous to their actions over time (North 1981, 1991; Greif and Laitin 2004; Greif 2006; Kuran 2011; Alston et al. 2016; Bisin and Verdier 2017).

[3]Our theoretical insight has similar features to the one proposed by Bénabou, Ticchi and Vindigni (2016), who develop a theory of the role religion can play in preventing scientific progress. Whereas they focus on the content of religious beliefs and the threat that certain technologies pose to those beliefs, we focus on the

Our model departs from—and adds to—the standard political economy explanation of institutional calcification, in which stagnation occurs when it is in the interest of the politically powerful for the status quo to prevail (Acemoglu 2003; North, Wallis and Weingast 2009; Acemoglu and Robinson 2006, 2012; Blaydes and Chaney 2013). This view is rooted in North's idea that a society's *formal institutions*—those political, legal, social, and economic mechanisms that establish the formal "rules of the game" and the incentives faced by the players therein—are the key drivers of economic and political outcomes. The "formal institutions of political economy" view clearly explains many cases of economic and institutional stagnation. Yet, it cannot explain why cultural backlashes are so often linked to institutional stagnation and how such cultural changes can come to impinge upon a society's institutions. The goal of this paper is to provide such an explanation.

This paper is not the first one in economics to suggest an interaction between culture and institutions, although it is the first, to our knowledge, to present a theory of how cultural backlashes can nullify the economic benefits of institutional change.[4] Indeed, some recent papers are particularly relevant to our hypothesis. The theory paper most similar to ours is Bisin and Verdier (2017), who also study the co-evolution of institutions and culture. They argue that culture and institutions may act as complements or substitutes. In the former (latter) case, the interaction of the two strengthens (weakens) the equilibrium patterns and institutions are more (less) likely to produce their desired effect. Bisin et al. (2018) use a similar framework to study the joint evolution of religious norms and institutions, and their effect on technology adoption, political decentralization, and military conquests. While we build off of many of the insights of the workhorse model of Bisin and Verdier (2017), the key difference between our two models is that we are interested in understanding how traditional

interaction between institutional and cultural composition of society independent of the content of beliefs. Hence, the two views are highly complementary and help explain different, although related, phenomena.

[4]For overviews of recent developments of various aspects of this literature, see Guiso, Sapienza and Zingales (2006), Nunn (2012), Spolaore and Wacziarg (2013), Algan and Cahuc (2014), and Alesina and Giuliano (2015).

values and beliefs can become more prevalent in reaction to institutional changes that are not particularly amenable to such values and beliefs.

A growing literature studies the effect of forward-looking cultural leaders on the evolution of identity. In Verdier and Zenou (2018), cultural leaders exploit their knowledge of cultural dynamics in setting their public good provision strategy.[5] They show that leaders may engage in excessive cultural competition, as they benefit from larger groups. Seror (2018) seeks to explain the persistence of religious prohibitions implemented by cultural leaders. Relatedly, Hauk and Mueller (2015) consider a model of cultural conflict where cultural leaders supply and interpret culture, while Prummer and Siedlarek (2017) studies the persistent differences in cultural traits of immigrant groups with the presence of community leaders. Our main contribution relative to this literature is to consider forward-looking political elites that internalize the joint dynamics of culture and institutions in their decisions, instead of assuming institutions to be fixed and exogenous.[6] This is hardly a trivial issue; setbacks and reversals in modern institutional development are a primary reason for the failure of laggard economies to converge with the leaders (North 1981; Acemoglu, Johnson and Robinson 2001, 2005; Rodrik, Subramanian and Trebbi 2004; Greif 2006; Kuran 2011; Acemoglu and Robinson 2012; Rubin 2017). Our paper addresses precisely this point.

The rest of our paper proceeds as follows. Section 2 lays out the generalized model. Section 3 reveals the intuition regarding why and how cultural revivals emerge, and Section 4 offers some concluding thoughts.

[5] See as well Bisin and Verdier (2000) on forward-looking leaders in a political economy context.

[6] Two other related articles are Giuliano and Nunn (2017) and Acemoglu and Jackson (2017). Giuliano and Nunn (2017) show that, consistent with the anthropology literature, societies tend to emphasize traditional values more in relatively stable and predictable environments. They find a negative correlation between negative economic shocks and traditional values both cross-sectionally and intertemporally. Acemoglu and Jackson (2017) investigate the co-evolution of social norms and the enforcement of codified laws. They argue that laws which are in conflict with prevailing social norms may be counterproductive; it is only when such laws are gradually introduced that they are effective. This insight is a subset of the more general findings of our model, which can also account for why societies become *more* traditional in response to a shock.

2 The Model

We start by assuming there are two types of agents in the economy: elites and civil society. Based on the optimal behavior and interactions of the elites and civil society, there are different paths of institutional evolution and cultural change that achieve economic development.

2.1 Civil Society

We consider two cultural types, type 1 and type 2. Given a continuum $[0, 1]$ of agents, we denote q_t the fraction of agents of type 1 in period t. Agents live for two periods. In the first period of their life, they are young. They make no strategic decisions, and they receive cultural norms from their parents. In the second period, agents are adults. They first realize their cultural type and have one child. Then, they choose to consume various commodities and to invest time and resources in order to transmit their cultural type to their child. At the end of period 2 the adults are replaced by the new generation of adults, and so forth.

Additionally, there are two types of public goods, g^1 and g^2. We consider agents within civil society as producing units and maximizing consumption. They combine time, market goods, and public goods via production functions in order to produce commodities and to raise their child. Following Becker (1965), we denote Z_k^i the production of commodity k by an agent of type i, with:

$$Z_k^i = f_k(\tau_k^i, x_k^i, \{g^1, g^2\}), \tag{1}$$

where τ_k^i is the time devoted to the production of Z_k^i, x_k^i a vector of market goods, and $k \in \{1, \ldots, m\}$ with m the number of goods produced by an agent. The production function f_k is assumed increasing and concave. Agents of type i use the public goods g^1 and g^2 for consumption and production.

Similarly, we assume that by devoting time and resources to their child, parents can increase the likelihood of transmitting their own cultural type. We denote d_t^i the probability

that a parent is successful in transmitting his cultural type, with

$$d_t^i = h^i(\tau_d^i, x_d^i, g_t^i). \tag{2}$$

The function h is increasing in τ_d^i, x_d^i, and g_t^i, while it is concave in all of its arguments. The parameter τ_d^i denotes the time devoted to child rearing, and x_d^i a vector of resources, e.g. toys, food, and so forth.[7] We assume that the utility of an agent of type i takes the following form:

$$\begin{aligned} U^i &= U_p^i(Z_1^i, \ldots, Z_M^i) + \alpha\, \mathbb{E}\, u_c^i(d_t^i) \\ &= U^i(\tau_1^i, \ldots \tau_m^i, x_1^i, \ldots, x_M^i, \{g^1, g^2\}) + \alpha\, \mathbb{E}\, u_c^i(h^i(\tau_d^i, x_d^i, g_t^i)) \end{aligned} \tag{3}$$

An adult derives utility U_p^i from his own private consumption, as he devotes time and resources to produce a set of commodities $\{Z_1^i, \ldots, Z_M^i\}$. The parent also displays *altruism*, and $\alpha > 0$ denotes the weight of the child's welfare in the parent's objective function. The expected utility of the child is denoted $\mathbb{E}\, u_c^i$, and it depends on the resources the parent devotes to child rearing.

Each agent maximizes his utility function by choosing the time and resources devoted to child rearing and to private consumption. Each agent faces a budget constraint, with

$$e(\tau_1^i, \ldots \tau_m^i, x_1^i, \ldots x_M^i; \tau_d^i, x_d^i) \leq W \tag{4}$$

denoting the expenditure function of an agent of type i, with W being his full income.[8] We denote $u^i(g^1, g^2)$ the indirect utility of an agent of type i.

[7] See Seror (2019) for a more general theory of child development in rearing interactions.

[8] Becker (1965) demonstrates that the problem can be simplified to that of maximization of a utility function subject to a unique budget constraint.

2.2 Elites

The provision of good g^i depends on the society's prevailing institutions. In particular, it depends on the political strength of the society's elites. Elites have a vested interest in the provision of particular types of public goods. For instance, merchants desire protection of property rights as well as transport infrastructure (North 1981; Acemoglu and Robinson 2012), military elites desire spending on defense (Tilly 1990; Hoffman 2015), religious authorities advocate for spending on religious infrastructure and education (possibly to the detriment of spending on secular public education; see Gill (1998), Coşgel and Miceli (2009), Chaudhary and Rubin (2016), and Rubin (2017)), and elites in "dying" industries may push for subsidies or tariffs to revitalize their industry (e.g., coal mining in the United States).

There are two types of elites, $i \in \{1, 2\}$, corresponding to the public good in which they have a vested interest in providing. We conceptualize each type of elite as having a political weight which reflects the relative political bargaining power of each party. As we will show below, this can be conceptualized as the weights given to each player in a nonsymmetric Nash bargaining game (Kalai 1977).

The political weight of the elites of type 1 is denoted $\lambda_t \in [0, 1]$. Each type of elite is forward-looking with a three-period time horizon. As will become clear, the fact that elites are forward-looking is crucial for the model's intuition and solution. However, the assumption that their time horizon is only three periods is not crucial—it is a simplifying assumption that does not drive any result.[9]

Elites bargain over the available resources. We denote $r > 0$ the total resources available to the elites in period t. These resources are comprised of tax collection, fruits of landed

[9] Any time horizon that exceeds that of non-elites would yield the same qualitative results. Since individuals in civil society live for two periods, a minimum of three periods is needed so that cultural and institutional decisions have sufficient time to interact. A longer time horizon would yield the same results so long as the discount factor, δ, is not sufficiently large. When δ is very large, elites are forward-looking enough to only care about the steady state, and cultural revivals thus do not occur. Since we have no intuition regarding the discount factor, we chose to favor parsimony rather than have additional qualifications on the results.

estates, and other forms of income, e.g. natural resources windfalls. Elites have utility:

$$U_t^e = u_t^e + \delta \, \mathbb{E} \, u_{t+1}^e + \delta^2 \, \mathbb{E} \, u_{t+2}^e, \tag{5}$$

with

$$u_t^e = \log([v(g_t^1) - v(0)]^{\lambda_t}[v(g_t^2) - v(0)]^{1-\lambda_t}), \tag{6}$$

and $v(0) = 0$, $v' > 0$ and $v'' < 0$. The parameter $\delta > 0$ is a discount factor. The bargaining powers of the elites are assumed equal to their political weights. In other words, the weighted utilities of the elites laid out in (6) reflect a Nash bargain between the two types of elites.[10]

In any period t, the elites bargain over the optimal allocation of public goods (g_t^1, g_t^2), given the budget constraint

$$g_t^1 + g_t^2 \leq r. \tag{7}$$

Elites also internalize how their choices will affect their future bargaining power, as the current public good provision affects future institutions and the cultural composition.

In any period t, agents in civil society seek to maximize their objective function (3) by choosing their private consumption, as well as the time and resources devoted to child rearing. Similarly, the elites engage in a Nash bargain over the provision of good 1 and good 2. Based on the optimal behavior and interactions of the elites and civil society, there are different paths of institutional building and cultural change, as we explain next.

[10] While we abstract from rulers and their role in society and the political bargain, one can easily incorporate them into this framework. In particular, one can consider a ruler with a time horizon that is similar to the elites and one who collects rents based on taxation on economic activity. Its political survival could also be endogenous with respect to its actions. Their ability to set (tax) policy could be dependent on the Nash bargain between the elites and the ruler. Nonetheless, as long as the ruler's objective involves survival and maximization of tax revenue, the optimal behavior of such a ruler would be to accommodate the cultural and institutional dynamics that evolve based on the forces we outline in the model.

2.3 Cultural Dynamics

Socialization: As in Bisin and Verdier (2001), socialization is modeled as the result of direct vertical (parental) and horizontal/oblique socialization in society at large.[11] Vertical socialization to the parent's trait $i \in \{1, 2\}$ occurs with probability d_t^i, and if that fails the child receives a trait (horizontally) from someone in the population at random. We write the child's expected utility as:

$$\mathbb{E}\, u_c^i(d_t^i) = \{d_t^i + (1 - d_t^i)q_t\}u(g_{t+1}^{1,e}, g_{t+1}^{2,e}) + (1 - d_t^i)(1 - q_t)u. \tag{8}$$

With probability $d_t^i + (1 - d_t^i)q_t$, the child is socialized by an agent of type i and will derive a utility $u(g_{t+1}^{1,e}, g_{t+1}^{2,e})$ when adult. The parameter $g_{t+1}^{i,e}$ denotes the parent's expectation of the provision of good i in the following period (when the parent won't be alive). With probability $(1 - d_t^i)(1 - q_t)$, the child is socialized by an agent of type $j \neq i$. In this case, in the eyes of his parent, the child is expected to derive lower utility, which by assumption is equal to a constant $u \geq 0$, with $u < u(g_{t+1}^{1,e}, g_{t+1}^{2,e})$.[12]

Indoctrination: Next, we assume that public good provision affects the efficiency of agents to transmit their cultural type. More specifically, we assume that there is a complementarity between the provision of good g^i, and the productivity of the investments in child rearing made by an agent of type i:

$$\frac{\partial^2 h^i}{\partial \tau_d^i \partial g_t^i} > 0, \text{ and } \frac{\partial^2 h^i}{\partial x_d^i \partial g_t^i} > 0. \tag{9}$$

As a simple illustration, it may be easier for parents to transmit a traditional religious identity if the state subsidizes religious education.

[11] Vertical, horizontal, and oblique transmission are the core mechanisms in the dual-inheritance theory of cultural evolution. For more, see Cavalli-Sforza and Feldman (1981), Boyd and Richerson (1985), Bisin and Verdier (2009), and Henrich (2015).

[12] This modeling choice is made for simplicity, and relates to the imperfect empathy assumption of Bisin and Verdier (2001). Micro-foundations of this assumption can be found in Seror (2019).

Complementarity between Private Consumption and Public Good Provision: Finally, we assume that:

$$\frac{\partial U_p^i}{\partial g^j} = \begin{cases} \phi^i > 0 \text{ if } i = j \\ 0 \text{ otherwise.} \end{cases} \tag{10}$$

In words, type i agents value a higher provision of good g^i, while good $j \neq i$ does not affect their consumption and production choices. As an illustration, higher education and economic integration are valued by individuals that seek to make a living in the modern economy, while it has limited impact on the traditional way of living.

We deduce the following trajectory of cultural change (all proofs are in Appendix A):

Proposition 1 *(**Cultural Change**):*

- *In any period t, the fraction of type 1 agents change, so that:*

$$q_{t+1} = q_t + q_t(1 - q_t)(d_t^1 - d_t^2). \tag{11}$$

- *In period $t + 1$, the fraction of agents of type 1, q_{t+1}, is positively affected by the provision of good (g_t^1), by the marginal utility of good 1 (ϕ^1), and is negatively affected by the provision of good (g_t^2), and by the marginal utility of good 2 (ϕ^2).*

Proof. The proof is available in Appendix A.1. ■

From (9), a higher provision of good 1 increases the time and resources that type 1 agents devote to child rearing. Hence, these agents are more successful in transmitting their trait and q_{t+1} is greater. Alternatively, from (9) again, a higher provision of good 2 incentivizes the agents of type 2 to devote more time and resources to child rearing. Hence, type 2 agents are more successful in passing their trait, and q_{t+1} decreases.

2.4 Institutional Dynamics

In accordance with a large literature, we conceptualize institutions as mechanisms which generate regularities of behavior through the aggregation and implementation of social choices (North 1981, 1990; David 1994; Greif 2006). In the spirit of Greif and Laitin (2004) and Bisin and Verdier (2017), institutions are considered exogenous to individuals at any given point in time, but the actions taken by those individuals result in endogenous institutional change over time.

In this economy, an externality problem is implied by the player's optimal choices. The choices of g_t^1 and g_t^2 affect the utility derived by civil society, as the public goods complement the utility of the agents differently. Hence, in a society where the majority of the population belongs to type 1, a weak provision of good g_t^1 is not socially efficient, as the majority of the agents prefer to use good g_t^1 in their own private production, consumption, and cultural transmission investments. Hence, social efficiency depends on the cultural composition of the population, q_t.

We model institutions as changing to reduce this externality, albeit subject to frictions and shocks. Institutional change reduces the externality by redistributing political power to elites so that their preferences are more aligned with the cultural composition of society. We therefore express institutional dynamics as follows:

$$\lambda_{t+1} = \lambda_t + \epsilon_t + \eta z(q_t). \tag{12}$$

In equation (12), the stochastic term ϵ_t is drawn from a distribution $F(.)$ that takes support on the real line with $\mathbb{E}(\epsilon_t) = 0$. Hence, we assume that institutions follow a random walk, save for the role of institutional change in the final term on the right-hand side of equation (12).

The parameter $\eta \geq 0$ denotes the social friction coefficient. It captures the idea that institutions are deeply ingrained features of society and do not respond immediately to

outside stimuli (North 1991; Greif 2006). The function $z(q_t)$ is related to the degree of social efficiency, given the strategic decisions made by the agents and elites in period t. Specifically, if $z(q_t) > 0$, then it is socially efficient to empower elites of type 1. Reciprocally, when $z(q_t) < 0$, then it is socially efficient to empower elites of type 2. We assume that the function $q_t \to z(q_t)$ is increasing and concave. Institutions evolve so as to achieve a higher degree of social efficiency, as an increase in the fraction of agents of type 1 (resp. 2) leads to greater bargaining power of the elites of type 1 (resp. 2), and hence to a higher provision of public good 1 (resp. 2).[13]

With this formulation, we posit that institutions may evolve—however slowly—so as to achieve a higher degree of social efficiency over time. Importantly, we *do not* assume that institutions are always efficient or are moving society towards efficient outcomes (as in North and Thomas 1973, North 1981). As well, such a formulation also leaves room for vested interests to move institutions away from their optimal state (as in Kuran 2011; Rubin 2011, 2017).

The following results are established by solving the optimization problems of the agents and the elites. In any period t, the elites Nash bargain over the allocation of the two public goods, as they maximize (5), under the budget constraint (7), and internalize both the cultural dynamics (11) and the institutional dynamics (12). Simultaneously, civil society agents choose the time and resources they devote to private consumption and child rearing, as they maximize their utility (3), subject to their budget constraint (4).

Proposition 2 *(**Institutional Change**): Given that the magnitude of the frictions in institutional change is sufficiently large (i.e. η is sufficiently small):*

- *When the bargaining power of the elites $(\lambda_t, 1-\lambda_t)$ are balanced, then there exists several possible trajectories of institutional change.*

[13] For example, it could be that $z(q_t) = \frac{\partial}{\partial g_t^1}[q_t u^1(g_t^1, g_t^2) + (1-q_t)u^2(g_t^1, g_t^2)]$. In this case, if $\frac{\partial}{\partial g_t^1}\{q_t u^1(g_t^1, g_t^2) + (1-q_t)u^2(g_t^1, g_t^2)\} > 0$, on average, and at the margin, civil society positively values good 1. Hence, civil society aspires to a higher provision of good 1. This would eventually translate into institutional changes that empower type 1 elites, given the frictions η and stochastic institutional changes ϵ_t.

- *When one type of elite is sufficiently more powerful than the other, and absent large shocks ϵ_t, institutions necessarily reinforce the political power of the strong type of elite after a finite period of time.*

Proof. The proof is available in Appendix A.2. ■

In order to understand why—and under which conditions— Proposition 2 holds, we can write the first-order condition associated with the maximization program of the elites as:

$$\lambda_t \frac{v'(g_t^1)}{v(g_t^1)} - (1-\lambda_t)\frac{v'(g_t^2)}{v(g_t^2)} + \delta^2 \eta z'(q_{t+1}(\lambda_{t+2}^e))\frac{\partial q_{t+1}}{\partial g_t^1}[\log(v(g_{t+2}^{1,e}(\lambda_{t+2}^e)) - \log(v(g_{t+2}^{2,e}(\lambda_{t+2}^e))] = 0, \tag{13}$$

given that $g_\tau^1 + g_\tau^2 = r$, for $\tau \in \{t, t+1, t+2\}$, and q_{t+1} is given by (11). Additionally, λ_{t+2}^e denotes the expectations of the elites about the institutions of period $t+2$, and $g_{t+2}^{1,e}(\lambda_{t+2}^e)$ is the expected provision of good 1 in period $t+2$.[14]

The elites bargain over the provision of the two types of public goods. The first term in the first-order condition above gives the marginal value for the elites of type 1 (in period t) from a higher provision of good 1, given their political weight λ_t. The second term gives the marginal cost for the elites of type 2 (in period t) from a higher provision of good 1, given their political weight $1-\lambda_t$. Additionally, the elites care about their future bargaining, as they internalize that cultural values change over time and that institutions are responsive to the society's cultural composition. Hence, they internalize that a marginal increase in the provision of good 1 in period t will marginally increase the fraction of agents of type 1, as $\frac{\partial q_{t+1}}{\partial g_t^1} > 0$. In turn, this will also affect what constitutes a socially efficient institutional change in period $t+2$, making it more favorable to the agents and to the elites of type 1, as $z'(q_{t+1}) > 0$. The elites of type 1 may, therefore, have an incentive to over-provide good 1. By doing so, they stem the tide of cultural change, and align the *future* social efficiency with their own interests. Of course, the reverse holds true for elites of type 2.

[14] Given that elites are heterogeneous, expectations in period t could aggregate as follows: $\lambda_{t+2}^e = \lambda_t \lambda_{t+2}^{1,e} + (1-\lambda_t)\lambda_{t+2}^{2,e}$, with $\lambda_{t+2}^{i,e}$ the expectations of the elites of type $i \in \{1,2\}$. However, since expectations are rational, both types of elites have identical expectations. Hence, this boils down to λ_{t+2}^e.

Crucially, the willingness of elites to align future social efficiency with their own interests depends on the expectations that they form about the future. Elites who expect to be more powerful in the future are more willing to bargain over the allocation of resources in the current period. They internalize that this will serve their future interests, by affecting the course of cultural and institutional change. Therefore, cultural and institutional changes depend on the expectations of the elites about their future political influence. There exists only a few possible trajectories of cultural and institutional changes, with self-fulfilling expectations, that solves the following fixed point equation:

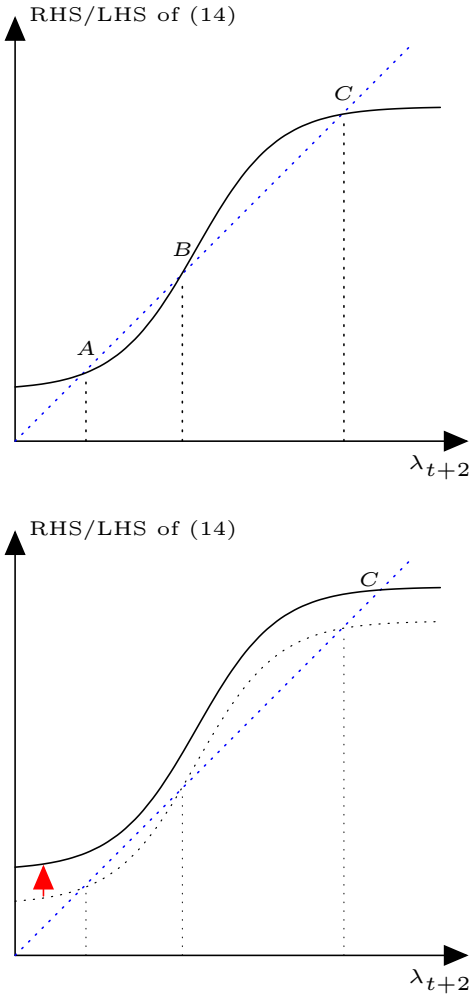
$$\lambda_{t+2} = \lambda_{t+1} + \epsilon_{t+1} + \eta z(q_{t+1}(\lambda_{t+2})), \tag{14}$$

with $q_{t+1}(\lambda_{t+2})$ denoting the fraction of agents of type 1 in period $t+1$. The optimal provision of public goods depends on the expectations of the elites. Therefore, the efforts that parents invest in child rearing also depends on the expectations of the elites about the future institutions, and so does q_{t+1}.

This intuition helps explain Proposition 2. Regarding the first result in Proposition 2, when the political weights of the elites are initially balanced, it is not clear to the elites who will hold more power in the future. In particular, it could be that despite being less powerful in period t, one type of elites can *rationally* expect to reverse the tide of social efficiency. Several trajectories of institutional and cultural change are possible where the expectations of the elites are self-fulfilling. One type of elites may increase its political bargaining over time, in spite of cultural values that are initially antagonistic to such changes. The fixed point equation (14) may admit several equilibria, as represented in the upper panel of Figure 1. The black curve represents the RHS of (14), while the dotted blue line represents the LHS. As represented, there are three intersections between the two curves. The extreme intersections (points A and C) represent stable equilibria. One of these stable solutions can be such that a reversal in the trajectory of institutions emerges.[15]

[15]Depending on the functional forms $v(.)$ and $z(.)$, more than two stable solutions may exist.

Figure 1: Solutions of the fixed point equation (14) for balanced political weights (upper panel), and unbalanced political weights (lower panel)



Note: the black curve is the RHS of (14), and the dotted blue line is the LHS of (14).

The second result in Proposition 2 follows from the simple observation that elites aspire to keep political power. By changing the course of cultural change, powerful elites may achieve such an outcome, *in spite* of cultural values that may, initially, be antagonistic to them. Powerful elites are always successful in turning the tide of what constitutes socially efficient institutional change, as they align cultural values with their own interests. Since they expect to keep their power—and absent large shocks, ϵ_t—they rationally over-provide their preferred public good. After a finite period of time, prevailing cultural values become congruent with the dominant elites' interests. As represented in the lower panel of Figure

1, when λ_{t+1} increases, the black curve shifts upward, as it represents the RHS of (14). Therefore, when type 1 elites are strong, only one possible trajectory for institutions is possible, where λ_t remains relatively high, as represented by point C on Figure 1. Similarly, if we were to consider the case of powerful elites of type 2, then the solid black line would shift down sufficiently so as to yield only equilibrium A in Figure 1.

3 Cultural Revivals and the Joint Dynamics of Culture and Institutions

The model established in Section 2 allows us to gain insight into *cultural revivals*. We conceptualize cultural revivals as movements in which the dominant cultural norms shift from those that are more productive to those that are less productive. In the context of the model, this might take the form of a cultural shift from type 2 to type 1 despite $\phi_1 < \phi_2$. Once such a cultural shift begins, institutions will eventually follow suit until institutions and culture reinforce each other at a sub-optimal equilibrium. Why would culture move towards a less efficient outcome? Our model provides some insight, but first we provide further motivation with historical examples.

3.1 Cultural Revivals

Cultural revivals are often associated with the ascendance of religious elites. Squicciarini (2019) provides a prototypical example. She finds that the Catholic Church responded to the second wave of industrialization in the 19th century by imposing an anti-scientific curriculum in Catholic schools, which harmed the economic outcomes of students in highly Catholic regions of France. Much as in our model, elites (the Church) altered cultural norms by investing in public goods provision (schools). This shifted the institutional and cultural paths against the headwinds of modernization in highly Catholic regions of France. This is precisely how we conceptualize cultural revivals.

Cultural revivals need not be associated with solely religious elites, however. Iyigun and Rubin (2017) study macro-level cultural revivals in the 17th-century Ottoman Empire, 19th-century Imperial China, and 18th–19th century Tokugawa Japan. Only in the first of these cases were religious elites important in facilitating the cultural revival. In each of these cases, rulers and elites were confronted with Western institutions and technologies that had the potential to upend the economic and social order. In the context of our model, the old political, military, and economic elite had cultural values complementary to the production of "traditional" goods, such as *timars* or *waqf* in the Ottoman Empire or Confucian education in Imperial China and Tokugawa Japan (i.e., those vested in good 1). Meanwhile, certain types of merchants, producers, and others with access to capital but not social prestige or political power had values consistent with good 2 (i.e., where $\phi_1 < \phi_2$). This latter group would have seen their returns rise immensely with the adoption of Western technologies, education, and institutions. Yet, in *each of these cases*, the reaction to the West was what we call a "cultural revival": cultural values favoring the established elites became *more predominant* in society, and institutions did not change to accommodate the new economic realities. Indeed, institutions ended up supporting the interests of the established elites all the more. We provide more detail for each of these historical cases in Appendix B.

In each of these examples, one set of institutions and culture had the potential to become more economically efficient, but culture and institutions evolved jointly in the *opposite direction*. Reform attempts, when they eventually came, had a clear and explicit objective of promoting and restoring traditional ways and methods. How can we explain such behavior? Clearly, efficiency arguments do not suffice (e.g., North and Thomas 1973). These societies all turned their backs on a more efficient economy, instead becoming more traditional and less efficient. Moreover, institutional stagnation due to vested interests cannot fully explain these phenomena (e.g., Acemoglu and Robinson 2000; 2006), since they do not explain why the society's broader culture also became more traditional and opposition to new institu-

tional organizations or technologies were broad among all segments of society—and not just among, and driven by, the elites.

We now turn back to the model to help shed light on how and why cultural revivals can emerge. Again, we assume that $\phi_1 < \phi_2$. That is, good 2 is relatively more valuable in private consumption, and also more efficient in helping the agents to transmit their cultural type. We might call the cultural norms associated with good 1 "traditional." There can exist multiple equilibria in such a setting: one in which elites mostly provide good 1 and cultural norms are consistent with good 1, and one in which this is the case for good 2. In order to understand the conditions under which a cultural revival may occur, we assume that the economy is not at a steady state in period t, and cultural norm 2 is relatively ascendant.

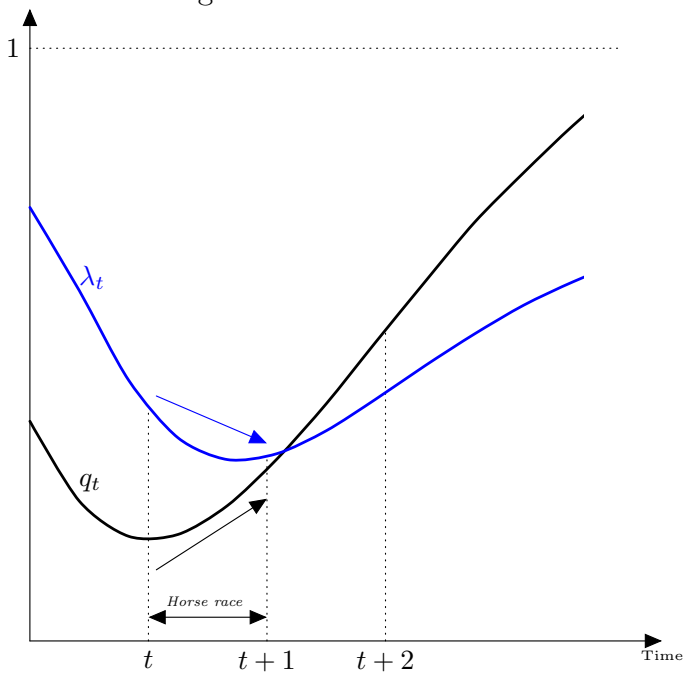
We want to understand the conditions under which a cultural revivial emerges. In period t, if the culture of type 2 is relatively ascendant (i.e., $q < 1/2$), but the institutions of type 1 dominate (i.e., $\lambda > 1/2$), there will be downward pressure on the institutional trajectory (i.e., $z < 0$). However, if good 1 is invested in sufficiently by elites, the cultural trajectory will favor good 1 (i.e., q increases). A "horse race" between culture and institutions ensues. When culture "wins" the horse race, the long-run steady state equilibrium is one in which culture and institutions complementary to good 1 are predominant. This is what we call a *cultural revival*. Formally, we define a cultural revival as:

Definition 1 *A* ***Cultural Revival*** *occurs when* $z(q_t) < 0$ *and* $\lambda_{t+1} < \lambda_t$*, but* $z(q_{t+1}) > 0$ *and* $\lambda_{t+2} > \lambda_{t+1}$*, because* q_{t+1} *increases sufficiently between periods* t *and* $t+1$*.*

When the political weights of the elites are initially balanced, then the joint evolution of culture and institutions is less predictable. As shown in Proposition 2, there can be several trajectories of institutional change. In some of these trajectories, cultural revivals arise, as the dominant cultural norms shift from those that are more productive to those that are less productive. The existence of cultural revivals crucially depends on the horse race that is triggered between institutions and culture. As represented in Figure 2, cultural values associated with good 2 are relatively ascendant prior to period t (i.e. q decreases

before period t). Similarly, the institutions associated with good 2 are relatively ascendant prior period t, and λ decreases. "Traditional" institutions and cultural values are declining in relevance. However, type 1 elites may *rationally* expect to reverse the tide of social efficiency, by affecting cultural composition. Indeed, it may be optimal for the elites of type 1 to over-provide good 1, so that q increases between periods t and $t+1$, $q_{t+1} > q_t$, as represented in Figure 2. Between periods t and $t+1$, culture and institutions evolve in opposite directions, as represented in the figure. If the changes in the cultural composition are significant enough relative to the opposite changes in institutions, then the tide of social efficiency is reversed. In such a case, as represented in Figure 2, the traditional elites are empowered in period $t+2$, as $\lambda_{t+2} > \lambda_{t+1}$.

Figure 2: Cultural Revival



In sum, by inducing cultural change, the "traditional" (type 1) elites *increase* their power over time, in spite of cultural values and institutions that were initially antagonistic to them. Institutions move too slowly to reverse this cultural change, and eventually the dominant culture is consistent with the interests of the traditional elites. Only then do institutions change to even further increase the political power of the traditional elites. While elites have

no power to directly alter institutions in their favor, they are ultimately able to do so by inducing cultural changes in their favor. And once culture sufficiently changes, institutions follow suit.

Throughout the paper, we made no assumption on how civil society forms expectation on the future. Yet this affects the time and resources that parents devote to child rearing, as well as the joint trajectory of culture and institutions. Hence, in an extended version of this model, the expectations of civil society could be strategically manipulated by elites seeking to increase their future bargaining weights. Alternative strategies may arise in such an extended version of the model, where the elites not only over-provide public goods, but also indoctrinate the masses, say through the media, in order to change their beliefs about the future. Such an extension would strengthen the main results, while generating new implications on the role of media and information dissemination in generating cultural revivals.

3.2 Exogenous Shocks and Cultural Revivals

Exogenous shocks can also trigger cultural revivals. This is what happened in the study by Fouka (2020), where a new policy regarding teaching German in schools triggered a revival of German identity. This was also the case in the Ottoman Empire, Qing China, and Tokugawa Japan, where contact with the West ignited a revival of long dormant cultural beliefs (for further details on our historical narrative, see Appendix B). In this light, we establish the following result:

Proposition 3 *An increase in the marginal utility of the agents from a higher provision of good* 2 *(ϕ^2) may* ***increase*** *the likelihood of cultural revivals.*

Proof. The proof is available in Appendix A.3. ■

This result indicates, first, that cultural revivals may be more likely to occur when the "advanced" sector becomes relatively *more efficient*. When the complementarity between

private consumption and public provision ϕ^2 increases, civil society has greater incentive to transmit culture complementary to good 2. Good 2 is all the more valuable in consumption and production decisions, and also more efficient in helping the agents to transmit their cultural type. At the same time, however, type 1 elites have more to lose, as they now provide a less efficient good. Their willingness to curb the trajectory of cultural change in their favor is thus greater. This explains why what could appear as "efficient" societal changes that promotes "better" modes of individual production and consumption can have deleterious effects on institutional and cultural change. Instead of leading to efficient institutional changes, it may reinforce the political power of the elites who promote *less* efficient modes of production. Such reforms may also lead to a reversal in the trajectory of cultural norms when they trigger a cultural revival. Although this result does not always obtain in the general case—due to possible non-convexities—we present a relatively general application of the model in Appendix A.3 where it necessarily holds under a simple set of conditions on the parameters.

4 Conclusion

In this paper, we propose a theoretical framework that seeks to explain the failure of societies to adopt beneficial institutions—even when adoption entails undeniable efficiency gains and is in the interest of the politically powerful—and why these failures so often coincide with a rise in traditionalist ideology or culture.

We propose an explanation that highlights the interplay between cultural beliefs and institutions. In our model, forward-looking elites may over-provide public goods associated with a more traditional (less efficient) sector that benefits their interests. This investment results in more agents generating cultural beliefs complementary to the provision of the traditional good, which in turn increases the future political power of the "traditional" elites. Hence, forward-looking elites increase investment, political power, and the cultural

capital associated with the more traditional sector of the economy, in the process generating a revival of beliefs associated with an outdated economic environment.

The insights provided by the model offer an explanation for why institutional reforms by themselves have historically not been the elixir of economic development. This has implications for various 21st-century efforts to impose democratic or economic institutions on societies whose ideologies are not equipped to handle them. For instance, attempts at instilling democracy in formerly autocratic states in the Middle East (e.g., Iraq and Egypt) ended in dysfunction. Likewise, Russia experienced massive corruption when implementing capitalist reforms following the fall of Communism. In these cases, societies that were culturally unready for massive institutional change were unable to adopt the intended changes in a functional manner.

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Appendices

A Proofs

A.1 Proof of Proposition 1

The fraction of agents of type 1 it period $t+1$ can be written as:

$$q_{t+1} = q_t + q_t(1-q_t)(1-d_t^2) - (1-q_t)q_t(1-d_t^1). \tag{A.1}$$

The second term in the RHS above gives the fraction of children raised by type 2 parents that become type 1 adults. The last term in the RHS above gives the fraction of children raised as type 1 that become type 2 adults. Hence, it is direct from (A.1) that the cultural dynamics can be written as:

$$q_{t+1} = q_t + q_t(1-q_t)(d_t^1 - d_t^2). \tag{A.2}$$

This establishes the first point of Proposition 1.

Relative to the second set of results in the proposition, first, we write the optimization problem of an agent of type i:

$$\max_{\{x_k^i,\tau_k^i\}_{k=1,\dots,M},\{x_d^i,\tau_d^i\}} U^i(\{x_k^i,\tau_k^i\}_{k=1,\dots,M}) + \alpha\,\mathbb{E}\,u_c^i(h^i(\tau_d^i,x_d^i,g_t^i)), \tag{A.3}$$

subject to

$$e(\{x_k^i,\tau_k^i\}_{k=1,\dots,M},\{x_d^i,\tau_d^i\}) \leq W, \tag{A.4}$$

given that the child's utility—as expected by the parent—is given in (8):

$$Eu_c^i(d_t^i) = \{d_t^i + (1-d_t^i)q_t\}u(g_{t+1}^{1,e},g_{t+1}^{2,e}) + (1-d_t^i)(1-q_t)u, \tag{A.5}$$

with d_t^i given in (2).

Hence, denoting $\mu > 0$ the Lagrange multiplier associated with the constraint (A.4), we can write the first-order condition associated with τ_d^1 as:

$$\alpha\frac{\partial h}{\partial \tau_d^1}(1-q_t)\{u^1(g_{t+1}^{1,e},g_{t+1}^{2,e}) - u\} - \mu\frac{\partial e}{\partial \tau_d^1} = 0 \tag{A.6}$$

when the solution is interior. Similarly, the first-order condition associated with x_d^1 can be written as:

$$\alpha \frac{\partial h}{\partial x_d^1}(1-q_t)\{u^1(g_{t+1}^{1,e}, g_{t+1}^{2,e}) - u\} - \mu \frac{\partial e}{\partial x_d^1} = 0 \tag{A.7}$$

when the solution is interior. We assume that this is always the case in the remainder of the proof, and we denote τ_d^{i*} and x_d^{i*} the optimal time and monetary investments in child rearing.

We deduce from the first-order conditions (A.6) and (A.7) that τ_d^{i*} and x_d^{i*} are increasing in g_t^i.

Indeed, when the provision of g^1 is higher in period t, then so is the marginal benefit, for a type 1 parent, of devoting time and resources to child rearing. This follows directly from the assumption (9) made in the main text:

$$\frac{\partial^2 h^i}{\partial \tau_d^i \partial g_t^i} > 0, \text{ and } \frac{\partial^2 h^i}{\partial x_d^i \partial g_t^i} > 0. \tag{A.8}$$

Hence, d_t^{1*} increases with g_t^1, while d_t^{2*} is not affected. Therefore, q_{t+1} increases with g_t^1. By a similar reasoning, we deduce that q_{t+1} decreases with g_t^2.

We now study the case where the marginal utility ϕ^1 of a higher provision of good 1 increases for type 1 agents. In such a case, type 1 parents expect a higher utility in the next period from being type 1. More formally:

$$\frac{\partial U_p^1}{\partial g^1} = \frac{\partial u^1(g_{t+1}^{1,e}, g_{t+1}^{1,e})}{\partial g^1} = \phi^1 > 0, \tag{A.9}$$

where the first equality follows from the envelop theorem. Hence,

$$\frac{u^1(g_{t+1}^{1,e}, g_{t+1}^{1,e})}{\partial \phi^1} > 0 \tag{A.10}$$

holds.[16]

When the marginal utility of good 1 (ϕ^1) increases, then so does the marginal benefit, for a type 1 parent, of devoting time and resources to child rearing. For a fixed public good provision scheme (g_t^1, g_t^2), then, q_{t+1} necessarily increases with (ϕ^1). Using similar reasoning, we deduce that q_{t+1} decreases with ϕ^2.

[16] Indeed, since $\frac{\partial u^1(g_{t+1}^{1,e}, g_{t+1}^{1,e})}{\partial g^1} = \phi^1$, then it must be that $u^1(g^1, g^2) = \phi^1 g^1 + K(g^2)$, with $K(g^2)$ a function of g^2.

A.2 Proof of Proposition 2

Elites bargain over the available resources. Hence, in period t, the provision of the public goods (g_t^1, g_t^2) maximizes the function (5), given that in each period, elites jointly face the budget constraint (7).

We deduce that the optimal provision of the public goods, in period t, solves the following first-order condition:

$$\lambda_t \frac{v'(g_t^1)}{v(g_t^1)} - (1-\lambda_t)\frac{v'(g_t^2)}{v(g_t^2)} + \delta^2 \eta z'(q_{t+1}) \frac{\partial q_{t+1}}{\partial g_t^1} [\log(v(g_{t+2}^{1,e}(\lambda_{t+2}^e)) - \log(v(g_{t+2}^{2,e}(\lambda_{t+2}^e))] = 0, \quad \text{(A.11)}$$

given that

$$\frac{\partial q_{t+1}}{\partial g_t^1} = q_t(1-q_t)\{\frac{dh^1}{dg_t^1} + \frac{dh^2}{dg_t^2}\}, \quad \text{(A.12)}$$

with

$$\frac{dh^1}{dg_t^1} = \frac{\partial h^1}{\partial g_t^1} + \frac{\partial h^1}{\partial x_d^1}\frac{\partial x_d^{1*}}{\partial g_t^1} + \frac{\partial h^1}{\partial \tau_d^1}\frac{\partial \tau_d^{1*}}{\partial g_t^1}. \quad \text{(A.13)}$$

We use the notation h^i for $h^i(\tau_d^{i*}, x_d^{i*}, g_t^i)$ as a matter of simplification in this proof. As established in the proof of Proposition 1, a higher provision of good 1 positively affects the effort of transmission of the agents of type 1. From Assumption (9), it also complements the time and resources that parents devote to child rearing. Hence, $\frac{dh^1}{dg_t^1} > 0$. From a similarly reasoning, $\frac{dh^2}{dg_t^2} > 0$. We deduce that

$$\frac{\partial q_{t+1}}{\partial g_t^1} > 0. \quad \text{(A.14)}$$

The concavity of the problem of the elites is not necessarily guaranteed in the general case. Indeed, non-linearities may arise when we take the derivative of the last term in the RHS of (A.11) with respect to g_t^1. However, in the case where η is equal to zero (i.e. the frictions in institutional change are maximum), then the problem is necessarily concave, as the derivative of the two first terms in the LHS of (A.11) is negative:

$$\lambda_t \frac{v''(g_t^1)v(g_t^1) - v'(g_t^1)^2}{v(g_t^1)^2} - (1-\lambda_t)\frac{-v''(g_t^2)v(g_t^2) + v'(g_t^2)^2}{v(g_t^2)^2} < 0. \quad \text{(A.15)}$$

Hence, in the case where η is sufficiently small, i.e. when there are enough frictions in institutional change, then concavity is necessarily verified. The Nash bargaining of the elites admits a unique solution (g_t^{1*}, g_t^{2*}).

Based on (A.11), when the elites form higher expectations over λ_{t+2}^e, the marginal benefit of provisioning good g_t^1, in period t, is higher. Indeed, the term $[\log(v(g_{t+2}^{1,e}(\lambda_{t+2}^e)) -$

$\log(v(g_{t+2}^{2,e}(\lambda_{t+2}^e))]$ increases with λ_{t+2}^e, while the rest of the first-order condition is not affected. We deduce that g_t^{1*} increases with λ_{t+2}^e, while $g_t^{2*} = r - g_t^{1*}$ decreases with λ_{t+2}^e.

Finally, from the proof of Proposition 1, we know that q_{t+1} increases with the provision of good 1, and decreases with that of good 2. Hence, combining the last result established above with Proposition 1, we deduce that q_{t+1} increases with λ_{t+2}^e. In order to emphasize the dependency of q_{t+1} on λ_{t+2}^e, we will denote $q_{t+1} \equiv q_{t+1}(\lambda_{t+2}^e)$ in the rest of this proof.

The institutional dynamics provided in the main text (12) is:

$$\lambda_{t+1} = \lambda_t + \epsilon_t + \eta z(q_t). \tag{A.16}$$

Hence, from periods $t+1$ to $t+2$ – given that elites have rational expectations – the institutions change, so as to solve the following fixed point equation:

$$\lambda_{t+2} = \lambda_{t+1} + \epsilon_{t+1} + \eta z(q_{t+1}(\lambda_{t+2})), \tag{A.17}$$

Since $z(.)$ increases with q_{t+1}, and q_{t+1} increases with the rational expectations of the elites λ_{t+2}, the equation above may admit several solutions where the expectations of the elites about the future institutions are rational. The multiplicity depends, in particular, on the convexity of the functional forms $z(.)$ and $v(.)$.

A.3 Proof of Proposition 3

When the elites bargain over the available resources, the public policy solves the following first-order condition, as explained in the previous proof:

$$\lambda_t \frac{v'(g_t^1)}{v(g_t^1)} - (1-\lambda_t)\frac{v'(g_t^2)}{v(g_t^2)} + \delta^2 \eta z'(q_{t+1}) \frac{\partial q_{t+1}}{\partial g_t^1} [\log(v(g_{t+2}^{1,e}(\lambda_{t+2}^e)) - \log(v(g_{t+2}^{2,e}(\lambda_{t+2}^e))] = 0, \tag{A.18}$$

given that

$$\frac{\partial q_{t+1}}{\partial g_t^1} = q_t(1-q_t)\{\frac{dh^1}{dg_t^1} + \frac{dh^2}{dg_t^2}\}, \tag{A.19}$$

with

$$\frac{dh^1}{dg_t^1} = \frac{\partial h^1}{\partial g_t^1} + \frac{\partial h^1}{\partial x_d^1}\frac{\partial x_d^{1*}}{\partial g_t^1} + \frac{\partial h^1}{\partial \tau_d^1}\frac{\partial \tau_d^{1*}}{\partial g_t^1}. \tag{A.20}$$

Hence, the existence of a revival outcome depends on the magnitude of the coefficient $\delta^2 \eta z'(q_{t+1}) \frac{\partial q_{t+1}}{\partial g_t^1}$. Indeed, when this coefficient increases, then the marginal benefit of provisioning good 1—given that the elites expect $\lambda_{t+2}^e > 1/2$—is larger. There is more scope

for an elite bargaining outcome which results in an institutional outcome where $\lambda^e_{t+2} > 1/2$. Hence, the likelihood of a revival increases.[17]

Consider now an increase in ϕ^2, the marginal utility, for the agent of type 2, of the provision of the public good 2.

From Proposition 1, then, we deduce that q_{t+1} is expected to decrease with ϕ^2. Hence, by concavity of $z(.)$, we expect $z'(q_{t+1})$ to be higher when ϕ^2 increases. Since ϕ^2 affects the transmission strategy of the agents of type 2, however, it is not clear how ϕ^2 will affect $\frac{\partial q_{t+1}}{\partial g^1_t}$ in the general case. This is why, in the general case, we cannot make a clear cut prediction for the effect of a higher value of ϕ^2 on the existence of cultural revivals.

In any case, when ϕ^2 increases, since $z'(q_{t+1})$ is expected to increase as well, then the coefficient $\delta^2\eta z'(q_{t+1})\frac{\partial q_{t+1}}{\partial g^1_t}$ *may* increase. This explains why it is impossible to rule out the result that revival outcomes may be more likely when ϕ^2 increases. This concludes the proof of Proposition 3.

Finally, in order to support the claim that the result of Proposition 3 is not necessarily driven by the concavity of the function $z(.)$, we apply the model to a case that stays relatively general. We will demonstrate that in the example presented below, when ϕ^2 increases, so does the likelihood of cultural revivals.

Example: As an application of the model, we consider the following specification for the utility function of an individual of type 1:

$$U^1 = U^1_p + \alpha\,\mathbb{E}\,u^1_c(d^1_t), \tag{A.21}$$

with

$$\begin{cases} U^1_p = \phi^1 g^1_t + \ln(c^1_t) \text{ and,} \\ \mathbb{E}\,u^1_c(d^1_t) = \{(1-d^1_t)q_t + d^1_t\}(\phi^1 g^{1*,e}_{t+1} + \ln(c^{1*,e}_{t+1})) + (1-d^1_t)(1-q_t)u, \end{cases} \tag{A.22}$$

with $d^1_t = h^1(x^1_t, g^1_t) = f(g^1_t)x^1_t$, x^1_t the resources invested in child rearing (we assume no time investments here), c^1_t the private consumption, and $f(.)$ an increasing, bounded, and concave function. Additionally, $g^{1*,e}_{t+1}$ and $c^{1*,e}_{t+1}$ respectively denote the expected provision of good 1 in period $t+1$, and the expected private consumption of the child in $t+1$.

The budget constraint faced by an individual is simply:

$$c^1_t + x^1_t \leq W. \tag{A.23}$$

[17] Observe that, symmetrically, there is also more scope for an elite bargaining which results in an institutional outcome where $\lambda^e_{t+2} < 1/2$ when $\delta^2\eta z'(q_{t+1})\frac{\partial q_{t+1}}{\partial g^1_t}$ increases.

Furthermore, the functional form (A.21) satisfies the assumptions made in the main text, as

$$\frac{\partial U_p^1}{\partial g_t^1} = \phi^1, \tag{A.24}$$

and $h^1(x_t^1, g_t^1) = f(g_t^1)x_t^1$ is such that

$$\begin{cases} \frac{\partial h^1}{\partial g_t^1} > 0, \text{ and} \\ \frac{\partial^2 h^1}{\partial x_t^1 \partial g_t^1} > 0. \end{cases} \tag{A.25}$$

Similarly, we posit that for the agents of type 2,

$$U^2 = \phi^2 g_t^2 + \ln(c_t^2) + \alpha\{(\phi^2 g_{t+1}^{2*,e} + \ln(c_{t+1}^{2*,e}))((1-d_t^2)(1-q_t) + d_t^2) + (1-d_t^2)q_t u\}, \tag{A.26}$$

with $d_t^2 = h^2(g_t^2, x_t^2) = f(g_t^2)x_t^2$, and x_t^2 the resources invested in child rearing (we still assume no time investments), and c_t^2 the private consumption. The budget constraint faced by an individual of type 2 is also:

$$c_t^2 + x_t^2 \leq W. \tag{A.27}$$

From the optimization problem of a parent of type 1, we deduce that x_t^{1*}, the optimal investments in child rearing, solve the following first-order condition:

$$-\frac{1}{W - x_t^1} + h(g_t^1)(1-q_t)\alpha\{\phi^1 g_{t+1}^{1,e} + \ln(c_{t+1}^{1,e}) - u\}. \tag{A.28}$$

The problem is concave, hence the resources invested in child rearing are uniquely determined. Consistently with the results established in the general case, it is direct that x_t^{1*} increases with g_t^1 and ϕ^1. Furthermore, the cultural dynamics are given by:

$$q_{t+1} = q_t + q_t(1-q_t)(x_t^{1*} f(g_t^1) - x_t^{2*} f(g_t^2)). \tag{A.29}$$

It follows that, in this case,

$$\frac{\partial q_{t+1}}{\partial g_t^1} = q_t(1-q_t)\{x_t^{1*} f'(g_t^1) + \frac{\partial x_t^{1*}}{\partial g_t^1} f(g_t^1) + x_t^{2*} f'(g_t^2) + \frac{\partial x_t^{2*}}{\partial g_t^2} f(g_t^2)\}. \tag{A.30}$$

Furthermore, from the first-order condition (A.28), we deduce that:

$$h'(g_t^1)(1-q_t)\alpha\{\phi^1 g_{t+1}^{1,e} + \ln(c_{t+1}^{1,e}) - u\} - \frac{1}{(W - x_d^{1*})^2}\frac{\partial x_t^{1*}}{\partial g_t^1} = 0. \tag{A.31}$$

Hence, by differentiating the previous expression with respect to ϕ^1, we obtain that:

$$h'(g_t^1)(1-q_t)\alpha g_{t+1}^{1,e} - \frac{2}{(W-x_d^{1*})^3}\frac{\partial x_d^{1*}}{\partial g_t^1}\frac{\partial x_d^{1*}}{\partial \phi^1} - \frac{1}{(W-x_d^{1*})^2}\frac{\partial^2 x_t^{1*}}{\partial \phi^1 \partial g_t^1} = 0. \tag{A.32}$$

We obtain the expressions of $\frac{\partial x_d^{1*}}{\partial g_t^1}$ and $\frac{\partial x_d^{1*}}{\partial \phi^1}$ by differentiating the FOC associated with the maximization program of an agent of type 1.

The sign of $\frac{\partial^2 x_t^{1*}}{\partial \phi^1 \partial g_t^1}$ is not simply obtained, since the two first terms in the RHS of (A.32) have opposite signs. However, it is easy to find a condition over the parameters, such that the sign of $\frac{\partial x_d^{1*}}{\partial \phi^1}$ is fixed. We find that when the altruistic concerns of the parent α are low enough, then

$$\frac{\partial x_d^{1*}}{\partial \phi^1} > 0 \tag{A.33}$$

necessarily holds.[18] And from a similar reasoning, when α is low enough,

$$\frac{\partial^2 x_t^{2*}}{\partial \phi^2 \partial g_t^2} > 0. \tag{A.34}$$

At this stage, we can reconsider the effect of an increase in ϕ^2 on the magnitude of the coefficient $\delta^2 \eta z'(q_{t+1})\frac{\partial q_{t+1}}{\partial g_t^1}$.

First, since an increase in ϕ^2 decreases q_{t+1}, it increases $z'(q_{t+1})$. Type 1 elites have more to lose from institutional changes, as they now provide a less efficient good. Their willingness to curb the trajectory of cultural change in their favor is thus greater for that reason.

Second, we find that:

$$\frac{\partial^2 q_{t+1}}{\partial \phi^2 \partial g_t^1} = q_t(1-q_t)\{\frac{\partial x^{2*}}{\partial \phi^2} f'(g_t^2) + \frac{\partial^2 x_t^{2*}}{\partial \phi^2 g_t^2} f(g_t^2)\} > 0 \tag{A.35}$$

when α is sufficiently low. Civil society has greater incentive to transmit culture complementary to good 2. Good 2 is all the more valuable in consumption and production decisions, and also more efficient in helping the agents to transmit their cultural type, as $\frac{\partial^2 q_{t+1}}{\partial \phi^2 \partial g_t^1} > 0$.

Hence, we deduce that

$$\frac{\partial}{\partial \phi^2}[\delta^2 \eta z'(q_{t+1})\frac{\partial q_{t+1}}{\partial g_t^1}] > 0. \tag{A.36}$$

Unambiguously, when α is sufficiently low, the magnitude of the coefficient $\delta^2 \eta z'(q_{t+1})\frac{\partial q_{t+1}}{\partial g_t^1}$ increases with ϕ^2. In this example, then, an increase in ϕ^2 makes cultural revivals more likely.

[18] The formal condition on α is $\alpha < \frac{1}{2W\overline{h}(\phi^1 r + \ln(W) - u)}$ with $\overline{h}$ the maximum value of the function $h(.,.)$, which exists as $f(.)$ is bounded by assumption.

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B Historical Narrative

In this Appendix, we provide historical detail regarding the "cultural revivals" in the Ottoman Empire, Imperial China, and Tokugawa Japan. In all three cases, societies faced with a changing world responded with cultural and institutional changes favoring the "traditional way" of doing things. The Ottomans certainly recognized they had fallen behind the West, but their operating premise was the inferiority of anything Western—a belief that was justifiable in the sixteenth century context in which it emerged. The "traditionalist reform period" of the seventeenth and eighteenth centuries was built on this ideal of Ottoman superiority (Shaw 1976, p. 175). Reformers of this era viewed Ottoman failure vis-à-vis the West as a failure to apply the techniques and organizational forms employed under the glorious reign of Süleyman the Magnificent (r. 1520–66), a period often viewed as the apex of Ottoman power. The most important and skilled writer on Ottoman stagnation was Koçi Beg, an intimate advisor of Sultan Murad IV (r. 1623–40). Throughout his writings—many of which were used extensively by later writers of the genre—the concept of a past "Golden Age" under Süleyman was a dominant theme (or, the "imagined perfection" of the era before Süleyman, as denoted by Colin Imber [2016]). In effect, there was no desire or urgency during these early reform attempts to study and understand Western techniques and institutions (Howard 1988; Dale 2010; Iyigun 2015).

Imperial China responded to crises similarly. In the face of two contemporaneous crises—the rapid decimation of Chinese forces by the British in the First Opium War (1839–42) and numerous internal revolts—the Qing realized the need to modernize their economy and military. The Qing responded to the mid-nineteenth century crises with a set of policies known as the "Tongzhi Restoration" (1862–74), a period in which modernizing policies were enacted. Yet, these policies were implemented via the old, conservative bureaucratic institutions, led

by scholars steeped in cultural norms associated with traditional Confucian ideology (Wright 1957). Chinese "borrowing" of Western know-how and technology but not ideology or institutions is summarized by the famous formula: "Chinese learning as the basis; Western learning for practical use" (Wright 1957, p. 1). A key element of the Restorations was the so-called "Self-Strengthening Movement," which discouraged private enterprise, disparaged commerce and foreign trade, emphasized agriculture above all other forms of economic activity, encouraged frugality, and discouraged investment in infrastructure in favor of "traditional" handicrafts (Wright 1957, ch. 8–9). As a result, private modern industry had no legal status in China until the 20th century (Brown 1979; Ma 2004). These policies resulted in the loss of leadership in one of China's most important industries, sericulture (silk production), to Japan, whose Meiji government implemented Western reforms strongly encouraging private enterprise (despite its negative effects on traditional manufacturers) and important infrastructure such as the telegraph (Ma 2005).

In Tokugawa Japan, reform attempts began in the early eighteenth century, primarily in response to political economy disruptions associated with the rise of urban commercialism (Jansen 2000, p. 238–9). Their most prominent reforms included renovations in the educational system and the intellectual realm based on the orthodoxy of Chi Hsi Confucianism. Much like the Ottoman and Chinese reformers, Tokugawa reformers believed that traditionalist morals and political standards were correct in spite of an obviously changing world. What went wrong, according to this idea, was the failure of society to live up to these traditionalist standards (Duus 1976, p. 53).

When Ottoman and Chinese reforms complementary to more modern institutions and technologies did come—the 19th-century Ottoman Tanzimat Reforms and the Chinese response to failure in the Sino-Japanese War (1894–95)—it was too late, and the Ottoman and Chinese Empires failed soon thereafter. Yet, cultural revivals are not necessarily permanent. They can also be temporary. The transition from Tokugawa to Meiji Japan provides an historical example of such a temporary revival.

Japan's Meiji Restoration of the mid-19th century was a wholesale reform initiative based on an acknowledgment that the traditional social, political, and economic organization of Japanese society was inadequate to deal with the modern challenges of adopting Western technologies and methods of production. The transformative nature of the Meiji Restoration was manifested in the degree to which intellectual elites began to study and analyze the ways of the West. Beginning in the 1850s, Japanese writers were increasingly sent abroad to study. Many more learned about the West by studying books. These writers and scholars emerged as the intellectual elite in the 1860s and 1870s, replacing those versed in the Confucian style. It was this group that would produce the translations and original works that would ultimately disseminate knowledge of the West to the educated classes (Duus 1976, p. 87). By sending their children to Europe for education, members of the Japanese elite exposed their children to both Western techniques *and* the Western cultural ideals that enabled these techniques to function. Moreover, one of the most significant achievements of the Meiji era was the expansion and changing content of formal education and its interplay with other Meiji transformations in the institutional and economic realms. The introduction of universal education based on both the general and the technical was widely accepted. Education increasingly played a role in Meiji government policy, with the government spending more on education as a share of national income than many of the Western powers (Allen 1981, p. 2, 3).

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