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ABSTRACT

A Theory of Conservative Revivals*

Why do some societies fail to adopt more efficient political and economic institutions in response to changing economic conditions? And why do such conditions sometimes generate conservative ideological backlashes and, at other times, progressive social and political movements? We propose an explanation that highlights the interplay - or lack thereof - between productivity, cultural beliefs and institutions. In our model, production shocks that benefit one sector of the economy may induce forward-looking elites to provide public goods associated with a different, more traditional 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 political power of the traditional elite. Hence, productivity shocks in a more advanced sector of the economy can increase investment, political power, and 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with the more traditional sector of the economy, in the process generating a revival of beliefs associated with an outdated economic environment.

JEL Classification: D02, N40, N70, O33, O38, O43, Z10

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

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1 Introduction

Why do some societies fail to adopt political, economic, and educational institutions that are commensurate with a changing technological and economic landscape? History is replete with instances of societies cognizant of, but failing to adopt, advanced market structures, legal codes, and organizational forms. For instance, the Chinese Qing Empire famously turned inward in the 17th and 18th centuries, just as contact with the West made it obvious to casual observers that Western political institutions, fiscal capacity, and organizational forms were far superior. Likewise, European commercial law was widely used and permitted in the Ottoman Empire, but only for European merchants. The various European legal codes permitted much more complex financial transactions than what was available to Ottoman merchants (Kuran 2011). Why did the Ottomans not adopt such obviously beneficial institutions? Contemporary developments in many advanced and industrializing economies likewise attest that such outcomes are hardly confined to the pre-modern, non-industrialized world. Given the stakes involved, why do such institutional calcifications ever occur?

The answer most commonly given in the literature lays emphasis on a society’s political economy: stagnation occurs when it is in the interest of the politically powerful for the status quo to prevail (North 1981, 1990; Acemoglu 2003; North, Wallis and Weingast 2009; Acemoglu and Robinson 2006, 2012; Blaydes and Chaney 2013).¹ This view is rooted in North’s (1990) 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, technological, and institutional stagnation, and it is not the intention of this paper to undermine the importance of this view. Yet, there are numerous examples of stagnation despite the status quo being inconsistent with the interests of powerful decision makers. For example, while there are certainly interests that gain from climate science denial (energy companies) and evolution denial (certain religious groups), the traditional political economy approach has a difficult time explaining why such views have become so widespread in the general population, especially since their appeal is growing despite improvements in science and mounting contradictory evidence. A second example comes from contemporary Iraq and Egypt, where attempts to adopt or impose democratic institutions failed despite being in the interest of the politically powerful, who were in position to gain office via election. In both countries, chaos dominated the post-election political and economic scene, threatening any chance of democratic institutions succeeding.

Moreover, the standard political economy explanation cannot account for the following curious stylized

¹This hypothesis is particularly prevalent in the related literature on technology non-adoption (Acemoglu and Robinson 2000a, 2006; Chaudhry and Garner 2006; Coşgel, Miceli and Rubin 2012; Rubin 2017).

fact: the rejection of more efficient institutions against the backdrop of rapidly changing economic conditions is frequently coupled with a *conservative revival*. We shall operationalize and define a conservative revival further below, but broadly speaking we define it as a cultural phenomenon in which a social culture and political institutions that are not complementary to modern economic realities become relatively more ascendant. Contemporary examples of conservative revivals abound, including the widely expressed desire among some segments of the U.S. population to “return to the 1950s,” European reaction to Middle Eastern and African immigration, and the ubiquitous Middle Eastern trope of “returning to the Golden Age of Islam.”

Such traditional values are often incompatible with advanced technologies and a changing economic environment because they were formed when the technological and institutional environment was drastically different. In the Ottoman case, after it was clear that Western Europe had far surpassed the Empire, it was still true that “even the most intelligent and perceptive of Ottoman reformers at this time adhered to the basic premise that the Ottoman system was far superior to anything that the infidel might develop” (Shaw 1976). Chaney (2016) finds evidence of earlier roots of a rise in “traditional values” in the Middle East, noting that Islamic science began to decline in the 12th and 13th centuries, being replaced by more traditional modes of education in madrasas. On the micro level, Squicciarini (2018) finds that the Catholic Church promoted a highly anti-scientific school curriculum in the late-19th century, just as the returns to a more 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.² Indeed, macro-level examples of conservative revivals abound, including 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.³ Why do such conservative reactions so often go hand-in-hand with institutional stagnation?

This paper presents a model that addresses these puzzles by *endogenizing* institutional change and cultural transmission. In doing so, the model gives structure to North’s (1990) insight that formal institutions work in the intended manner only when complemented by a society’s informal institutions. Such a framework, like the one laid out in great length by Greif (2006), acknowledges that social norms, beliefs, and

²Fouka (2018) provides an example of a similar cultural backlash from post-WWI US education policy. A prohibition of German in public schools, which was intended to promote assimilation, had the effect of heightening cultural identity among Germans. Using more recent data, Goren and Chapp (2017) show that “culture war” issues trump political and religious affiliation in shaping opinions.

³More 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.”

informal organizations matter for economic development.⁴ Importantly, it also suggests that formal political institutions are malleable, with the softer—and harder to measure—institutional determinants bearing on the formal rules of the game.

We model a dynamic economy in which agents produce two goods in two different sectors. There are three players in our game: a ruler, elites, and society. We consider two types of elites, each of which benefits relatively more from production in one of the two sectors of the economy. For instance, medieval Europe consisted of religious and feudal elites, the Middle East consisted of religious, military, and economic elites, and Imperial China consisted of bureaucratic and economic elites (Blaydes and Chaney 2013; Rubin 2017; Platteau 2017). We do not consider the initial source of the elites’ power, but assume they have some weight in society that evolves over time as a function of the cultural beliefs of society and the investment and productivity of the public goods from which they benefit (as in Bisin and Verdier (2017)).

Furthermore, society has cultural beliefs that are complementary to the production of the two goods at potentially varying degrees. As in Bisin and Verdier (2001), individuals can choose (at cost) to transmit their cultural beliefs to their children with some positive probability (vertical transmission). Otherwise, children derive their culture as a function of the culture of either some peers or role models in society (horizontal or oblique transmission).⁵ Under the assumption that parents derive value from the success of their children, their cultural transmission decisions—and, more generally, the culture of the next generation—is a function of the prevailing culture and the investment in the two sectors by the elites (with the latter coming into play due to the complementarity between cultural beliefs and public goods in determining labor productivity).

An important aspect of our model is that agents who hold political power (i.e., ruler and the elites) have a longer time horizon than the citizenry. When making investment decisions regarding the two goods, they take into account how their investment will change the cultural composition of the population, and in turn affect the provision of the good and their rents in the following period.

To generate the central predictions of the model, we introduce a production shock which increases the efficiency of one of the two sectors in the economy. We find that, despite the fact that the technological shock happens in a given sector of the economy, a “conservative revival” is a potential outcome, whereby cultural norms complementary to the production of the *other* sector become more preponderant over time.⁶

The logic underlying our result is that elites in the “traditional” sector know that production in the other

⁴Informal institutions and culture have recently received renewed emphasis as a key contributor of England’s industrialization. See, most importantly, Mokyr (2010, 2016), McCloskey (2010, 2016), and de la Croix, Doepke and Mokyr (2018).

⁵Vertical, 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).

⁶Our theoretical insight has similar features to the one proposed by Bénabou, Ticchi and Vindigni (2016), who propose 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 effect that production shocks have on the 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.

sector will increase in the following period after a production shock is realized in that sector. All else equal, this will increase production of the latter good and, over time, increase the cultural norms complementary to the production of that good. Moreover, this will increase the political power of the elite in this sector at the expense of the “traditional” elite. Knowing this, the marginal value of (over-)investing in the traditional good in the present is greater for the traditional elite when there is a shock increasing the productivity of the good in the other sector. This result arises because of the cultural transmission process: in the absence of cultural considerations, society would eventually adopt the more efficiently produced good. But the cultural transmission process permits, under some conditions, the traditional sector to become more powerful and traditional culture to become relatively more widespread *after a positive shock to the other sector*. In other words, institutional conservatism is an outcome; it is not a root cause of failure to adopt more efficient institutions. Hence, in order for conservative outcomes to arise, our model does not require parents valuing their own “identity” (as in Akerlof and Kranton (2000) or Bénabou and Tirole (2011)) and thus wanting to pass that identity onto their children. Nor does it require parents wanting to require a reputation for making the right choices (and thus choosing what worked for them in the past), as in Prendergast and Stole (1996). An attractive feature of our model is that we find conditions under which “conservative revivals” arise despite parents having no preference for or against conservatism.

This paper is not the first one in economics to suggest an interaction between culture and institutions.⁷ Indeed, some recent papers are particularly relevant to our hypothesis. The recent 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. We build off of many of the insights of their workhorse model, and we model the interaction between cultural transmission and institutions in a similar manner. The key difference between our two models is that we introduce self-interested and forward-looking elites whose economic interests are differently aligned with production in the two sectors of the economy, as well as a productivity shock that impacts one of the two sectors. In doing so, we show how traditional values and beliefs can become more prevalent in reaction to new technologies 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 the cultural dynamics in setting their public provision strategy.⁸ The authors show that leaders may engage in excessive cultural competition, as they both benefit from larger groups. Although this effect is also present in this model, we show that a

⁷For 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).

⁸See as well the early work of Bisin and Verdier (2000) on forward-looking leaders in a political economy context.

changing technological landscape distorts cultural leaders' incentives to compete, and that this can generate a *conservative revival*. Seror (2018) seeks to explain the persistence of religious prohibition against usury and innovation, and presents a theory where religious leaders strategically change the religious doctrine so as to create occupational patterns that increase the size of their cultural group. 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 line of work is to consider the effect of self-interested and forward-looking cultural leaders on the joint dynamics of cultural norms and institutions. This is necessary in order to understand why conservative revivals, institutional stagnation, and *positive* economic shocks so frequently arise together.⁹ This is hardly a trivial issue; failure to adopt modern institutions is 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. Moreover, it is the first example of its kind to link the interplay among technologies, culture, and institutions on the one hand with sociopolitical movements that hinder or aid change on the other.

The rest of our paper proceeds as follows. Section 2 lays out the basic model. Section 3 uses the model's building blocks to develop a theory of conservative revivals. Section 4 offers some concluding thoughts.

2 The Model

The model gives a structure to North's (1990, 1991) insight that formal institutions complement a society's informal institutions. Such a framework, much like those found in Greif (2006) and Alston et al. (2016)—and modeled theoretically in Bisin and Verdier (2017)—acknowledges that social norms, beliefs, and informal organizations matter for economic development.

There are different paths of institutional building and cultural change that achieve economic development. As a matter of simplification, assume that societies essentially follow two paths of institutional building and cultural change. We consider three types of agents: a ruler, civil society, and elites.

Civil society is composed of two types of productive agents, and the production of an agent of type

⁹Two 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. Our model suggests a complement to their argument, indicating that there is a positive correlation between traditional values and certain types of *positive* economic shocks. 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* conservative in response to a shock.

$i \in \{1, 2\}$ in period t writes:

$$\pi_t^i = \alpha_0 + \phi_t^i g_t^i, \quad (1)$$

with g_t^i representing a public good that complements the production of the agents of type i , and $\phi_t^i > 0$ the degree of complementarity between the state provision of good g_t^i and the production of the agent of type i .

The provision of good g_t^i depends on the society's prevailing institutions. In particular, it depends on the political strength within the elite of some agents that value the production of that good. We will call these agents the elite i . As a simple example, the political strength of merchants matters when considering the provision of public goods that increase the protection of property rights (North 1981; Milgrom, North and Weingast 1990; Greif, Milgrom and Weingast 1994; Acemoglu and Robinson 2012; Rubin 2017). In turn, the protection of property rights affects the incentive of agents to produce.

The parameter ϕ_t^i relates to the *positive externality* of the state's provision of good g_t^i on the production of the agents of type i . A microeconomic interpretation would be that ϕ_t^i is the marginal return on factors of production for individuals of type i in period t . For instance, ϕ_t^i might reflect the returns to the type of labor that requires high levels of human capital, while g_t^i is the provision of public education. In such a case, ϕ_t^i would be a function of technology that is complementary to high-human capital labor (e.g., computer programming). The fraction of agents of type 1 is denoted q_t .

We assume that the utility of agents of type i is equal to their production net of a linear tax τ :

$$U_t^i = (1 - \tau)(\alpha_0 + \phi_t^i g_t^i). \quad (2)$$

The ruler cares about the revenues he extracts from the citizenry. We denote

$$R_t = r_t + \delta r_{t+1}, \quad (3)$$

with

$$r_t = \tau\{q_t(\alpha_0 + \phi_t^1 g_t^1) + (1 - q_t)(\alpha_0 + \phi_t^2 g_t^2)\} \quad (4)$$

the rents derived by the ruler in period t , with $\delta > 0$ a discount factor.

Finally, the elite agents have a vested interest in the provision of particular types of public goods. For instance, merchants desire protection of property rights and transport infrastructure (North 1981; Acemoglu and Robinson 2012), military elites desires 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), Cosgel 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 U.S.). We assume there are two types of elite, and the elite of type $i \in \{1, 2\}$ derives utility

$$w_t^i = v(g_t^i) + \delta^i v(g_{t+1}^i), \quad (5)$$

with $v(\cdot)$ increasing and concave and $\delta^i > 0$ the discount factor of the elite of type i .

The major difference between the citizenry on the one hand and the elites and ruler on the other hand is that the latter two are assumed to be forward-looking. We drop the time index when not necessary hereafter.

2.1 Cultural Dynamics

Cultural transmission is modeled as the result of *direct vertical* (parental) socialization and *horizontal/oblique* socialization in society at large (Bisin and Verdier 2001). *Direct vertical* socialization to the parent’s trait $i \in \{1, 2\}$ occurs with probability d_t^i . If a child from a family with trait i is not directly socialized, which occurs with probability $1 - d_t^i$, he/she is *horizontally/obliquely* socialized by picking the trait of a role model chosen randomly in the population. The probability P_t^{ij} that a child in group i is socialized to trait j writes as:

$$\begin{cases} P_t^{ii} = d_t^i + (1 - d_t^i)q_t^i \\ P_t^{ij} = (1 - d_t^i)q_t^j, \text{ if } i \neq j \end{cases} \quad (6)$$

with $q_t^1 = q_t$ and $q_t^2 = 1 - q_t$.

Let V_t^i denote the utility that the parent derives from having a child of type i .

$$\begin{cases} V_t^1 = U_t^1 = (1 - \tau_t)(\alpha_0 + \phi_t^1 g_t^1) \\ V_t^2 = U_t^2 = (1 - \tau_t)(\alpha_0 + \phi_t^2 g_t^2). \end{cases} \quad (7)$$

Let $\Delta V_t^1 = V_t^1 - V_t^2$ and $\Delta V_t^2 = -\Delta V_t^1$. We deduce from (7) that

$$\Delta V_t^1 = (1 - \tau_t)(\phi_t^1 g_t^1 - \phi_t^2 g_t^2). \quad (8)$$

Let $H(d_t^i) = \frac{1}{2}d_t^{i2}$ denote the socialization cost. Direct socialization, for any $i \in \{1, 2\}$, is then the solution to the following parental socialization problem:

$$\max_{d_t^i \in [0,1]} -\frac{1}{2}d_t^{i2} + P_t^{ii}V_t^i + P_t^{ij}V_t^j, \quad (9)$$

with P_t^{ij} given by (6). We deduce that

$$d_t^i = \begin{cases} q_t^j \Delta V_t^i & \text{if } \Delta V_t^i > 0 \\ 0 & \text{otherwise.} \end{cases} \quad (10)$$

The dynamics of cultural change are then given by:

$$q_{t+1} - q_t = z(q_t)(\phi_t^1 g_t^1 - \phi_t^2 g_t^2), \quad (11)$$

with

$$z(q_t) = \begin{cases} q_t(1 - q_t)^2 & \text{if } \phi_t^1 g_t^1 > \phi_t^2 g_t^2 \\ q_t^2(1 - q_t) & \text{otherwise.} \end{cases} \quad (12)$$

As can be observed directly from (11) and (12), when the provision of the public good g_t^1 increases in period t , the agents of type 1 (resp. type 2) are more (resp. less) prone to pass their cultural norms to their children, and q_t increases.

2.2 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; Bisin and Verdier 2017). 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 results in endogenous institutional change over time. Specifically, we posit that institutions necessarily evolve so as to achieve a higher degree of social efficiency, albeit with frictions, i.e. they tend to reduce the externalities and the distortions that are implied by social choices. 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). Instead, our conception is that institutions help resolve social problems (e.g., externalities, coordination, commitment problems) *conditional* on the actions of individuals whose actions are affected by the institutions in question (thus leaving room for vested interests to move institutions away from their optimal state, as in Kuran 2010; Rubin 2011, 2017). In other words, social efficiency depends on the current institutional arrangements as well as on the cultural composition of the population. Consequently, conceptualizing institutions as mechanisms that increase social efficiency does not contradict the existence of path dependency in cultural change or institutional building.

On this basis, we denote $\beta \in [0, 1]$ the (fixed) weight in social choice of the ruler, and $1 - \beta$ the combined

weight of the civil society and the elite agents. $\lambda_t \in [0, 1]$ gives the weight of the elites of type 1, while λ that of the elites of type 2. The elites of type 1 (resp. 2) derive utility from the provision of public good 1 (resp. 2). For instance, in medieval Europe, the two main groups of elites were the landed nobility and the Church. Their power vis-à-vis rulers (i.e., $(1 - \beta)\lambda_t$ and $(1 - \beta)(1 - \lambda_t)$) differed over time and place, especially after events such as the Reformation (Greif and Rubin 2018). In Imperial China, the two main types of elites were bureaucrats and the local gentry, with the former having much more power ($(1 - \beta)\lambda_t$) vis-à-vis the emperor (Chang 1955).

We are interested in understanding the possible determinants of the evolution of the institutional parameter λ_t and the equilibrium level of public good provision g^1 and g^2 , as functions of the marginal rates of return ϕ_t^1 and ϕ_t^2 . We wish as well to determine the joint dynamics of cultural diffusion q_t in the population and the institutional order in favor of institutions provisioning the public goods.

2.2.1 Societal Equilibrium

A societal equilibrium is a Nash equilibrium of the game between civil society, elite agents, and the ruler in an institutional set-up characterized by weights (β, λ_t) and distribution by cultural group q_t . The societal equilibrium captures the lack of commitment on the part of the ruler, who is not able to choose the policy that internalizes the effect it has on the elites' and the citizenry's choices. This lack of commitment will be the driving force of institutional change in this model.¹⁰ We assume that institutions evolve to enhance social efficiency *conditional* on the actions taken by the players (Greif and Laitin 2004).

We take the tax rate τ as fixed, while the elites set the levels of public good provision g_t^1 and g_t^2 so as to maximize the following social welfare function:

$$W_t(g_t^1, g_t^2) = \beta R_t + (1 - \beta)\{\lambda_t w_t^1 + (1 - \lambda_t)w_t^2 + [q_t U^1(g_t^1) + (1 - q_t)U^2(g_t^2)]\}, \quad (13)$$

given that

$$g_t^1 + g_t^2 \leq \tau[q_t(\alpha_0 + \phi_t^1 g_t^1) + (1 - q_t)(\alpha_0 + \phi_t^2 g_t^2)]. \quad (14)$$

The function w_t^i gives the utility of the elite i (see (5)). $U^i(\cdot)$ is the utility of agents of type i given in (2), while R_t is the revenue extracted by the ruler provided in (3). The equations for the social equilibrium of this society are:

$$\begin{cases} \lambda_t v'(g_t^1) - (1 - \lambda_t) \frac{1 - \tau q_t \phi_t^1}{1 - \tau(1 - q_t) \phi_t^2} v'(g_t^2) = 0 \\ g_t^1 + g_t^2 = \tau[q_t(\alpha_0 + \phi_t^1 g_t^1) + (1 - q_t)(\alpha_0 + \phi_t^2 g_t^2)]. \end{cases} \quad (15)$$

¹⁰See, for instance, Bisin and Verdier (2017) and Bisin et al. (2018) for similar models of institutional change.

This system of equations characterize a unique couple $g_t^1(\lambda_t, q_t, \phi_t^1, \phi_t^2)$ and $g_t^2(\lambda_t, q_t, \phi_t^1, \phi_t^2)$.

Lemma 1 *The provision of good i , $g_t^i(\lambda_t, q_t, \phi_t^1, \phi_t^2)$, increases with the political strength of the elite i , λ_t , with the fraction of agents of type i , q_t and with their marginal rate of return ϕ_t^i , while it decreases with the marginal rate of return of the agents of type $j \neq i$, ϕ_t^j .*

Not surprisingly, when the political strength of the elite of type 1 increases, the marginal benefit of provisioning good 1 increases as well, so g^1 increases in equilibrium. When the marginal rate of return of the agents of type 1 increases, then provisioning good 1 allows the ruler to collect more revenues from the citizenry, because it enhances the production of a higher share of individuals. Relatedly, when there are more individuals of type 1, then provisioning a higher quantity of good 1 allows the ruler to raise more revenues from the citizenry.

Coming back to our earlier discussion, we now clearly see the linkage between public good provision and institutions. When the institutions are such that the elites of type 1 have more political sway (i.e. λ is high), then the provision of good 1 should be high as well. Moreover, the more political clout elites of type i have, the greater is the increase in the provision of the public good associated with type i when then the marginal rate of return to type i elites increases.

2.2.2 Socially-Committed Equilibrium

Consider now the socially committed equilibrium policy $g_t^{i,op}$, $i \in \{1, 2\}$. In the socially committed equilibrium, the ruler internalizes the externalities exerted by public good provision on the rate of return of the agents. The socially committed equilibrium is then determined by the following program:

$$\max_{g_t^1, g_t^2} W_t(g_t^1, g_t^2) = \beta R_t(g_t^1, g_t^2) + (1 - \beta)\{\lambda_t w_t^1(g_t^1) + (1 - \lambda)w_t^2(g_t^2) + [q_t U^1(g_t^1) + (1 - q_t)U^2(g_t^2)], \quad (16)$$

with

$$\left\{ \begin{array}{l} g_t^1 + g_t^2 \leq \tau[q_t(\alpha_0 + \phi_t^1 g_t^1) + (1 - q_t)(\alpha_0 + \phi_t^2 g_t^2)] \\ w_t^i = v(g_t^i) + \delta^i v(g_{t+1}^i) \\ R_t = r_t + \delta r_{t+1} \\ q_{t+1} = q_t + z(q_t)(\phi_t^1 g_t^1 - \phi_t^2 g_t^2). \end{array} \right. \quad (17)$$

The ruler internalizes how public good provision affects the average utility of the civil society $q_t U^1(g_t^1) + (1 - q_t)U^2(g_t^2)$, and therefore how the provision of public goods affects the rents $r_t(g_t^1, g_t^2)$ that are extracted from the citizenry in the current period. Since the ruler is forward-looking, he also foresees the effect that

the current public policy has on the cultural composition of the population, and in turn on the future rents that are extracted from the citizenry. Similarly, the elite agents internalize the dynamics of cultural norms. What matters for them is not only how the policy implemented in a given period affects their current utility, but also how this policy—by changing the cultural composition of the population—will affect the provision of public goods and their rents in the following period.

In our model, institutions change to improve social welfare in period $t + 1$ conditional on actions taken by players in period t . Specifically, institutions help solve an intertemporal externality problem: the choice of g^1 and g^2 in period t affects the cultural composition in period $t + 1$ and thus the provision of public goods in $t + 1$. In our conception, λ adjusts—with frictions—to enhance social efficiency by altering political power such that the externality is internalized. This conception is consistent with Greif and Laitin (2004) in that institutions impose exogenous constraints on players in period t but adjust in period $t + 1$ *as a result* of actions taken in period t .

Specifically, we posit that the dynamics of institutions is given by the following equation:

$$\lambda_{t+1} = \lambda_t + c(\lambda_t, q_t)(f(\lambda_t) - \lambda_t), \quad (18)$$

with

$$f(\lambda_t) = \begin{cases} \lambda' \in [0, 1] \text{ with } g_t^1(\lambda') = g^{1,op}(\lambda_t), \text{ when } g^{1,op}(\lambda_t) \in [0, g^1(1)) \\ 1 \text{ when } g^1(1) \leq g^{1,op}(\lambda_t). \end{cases} \quad (19)$$

and $c(\lambda_t, q_t) \in [0, 1]$ a friction coefficient.

In words, the function $f(\lambda_t)$ provides the best possible institutions that can be implemented in period $t + 1$, for a given set of actions in period t . Indeed, when it is feasible and frictions are nonexistent so that $c(\lambda_t, q_t) = 1$, λ_{t+1} is such that the policy implemented in period $t + 1$ is precisely the policy that internalizes the intertemporal externality in period t , $g_t^1(\lambda_{t+1}) = g^{1,op}(\lambda_t)$. When the optimal provision of good 1 is above what can possibly be achieved in a social equilibrium, $g^1(1) \leq g^{1,op}(\lambda_t)$, then $\lambda_{t+1} = 1$ so as to achieve at least a level of provision $g^1(1)$.

Relative to the frictions in institutional change, observe first that when $c(\lambda_t, q_t) = 1$, the institutions that are set in period $t + 1$ completely solve the inefficiencies implied by the social choice in period t when it is feasible, i.e. $\lambda_{t+1} = f(\lambda_t)$ necessarily. Alternatively, when $c(\lambda_t, q_t) < 1$, the frictions prevent the institutions of period $t + 1$ to solve the intertemporal externality problems of period t , even when it is feasible. This can be because changing institutions can be an inefficient, long process that does not necessarily replicate the needs of the population. The frictions in institutional change arguably depend on the cultural composition

of the population, as well as on the current institutions. We will not specify the function $c(\lambda_t, q_t)$ in the sequel. We will however posit that $c(\lambda_t, q_t) > 0$ necessarily, meaning that institutions always change so as to *partially* reduce the intertemporal inefficiencies implied by social choice.

As a simple illustration before considering a more general case, we posit in the rest of this section that $\delta = 0$ and $\delta^i = 0$ for $i \in \{1, 2\}$, meaning that the ruler and the elite agents are not forward-looking. This is merely a simplifying assumption that helps make transparent the logic of the model. We will drop this assumption in Section 3, when we discuss conservative revivals. In the case where $\delta^i = 0$, the socially committed equilibrium policy verifies the following first-order condition:

$$\lambda_t v'(g_t^1) - (1 - \lambda_t) \frac{1 - \tau q_t \phi_t^1}{1 - \tau(1 - q_t) \phi_t^2} v'(g_t^2) + G_0(q_t) = 0, \quad (20)$$

with

$$G_0(q_t) = \beta \frac{\partial R_t}{\partial g_t^1} + (1 - \beta) [q_t \frac{\partial U_t^1}{\partial g_t^1} + (1 - q_t) \frac{\partial U_t^2}{\partial g_t^1}]. \quad (21)$$

We deduce the following result.

Lemma 2 *As long as $q_t > \bar{q}(\phi_t^1, \phi_t^2) = \phi_t^2 / (\phi_t^1 + \phi_t^2)$, $g_t^{1,op}(\lambda_t) > g_t^1(\lambda_t)$ and $g_t^{2,op}(\lambda_t) < g_t^2(\lambda_t)$.*

Proof. The proof is available in the Appendix. ■

When the fraction of agents of type 1 is sufficiently high, the provision of good 1 creates a positive externality. Institutions which give more political power to type 1 elites thus benefit the ruler—who captures more rents—and civil society as a whole, as their productivity increases. Observe also from the expression of $\bar{q}(\phi_t^1, \phi_t^2)$ that when ϕ_t^1 increases, the preceding effect is amplified, since the externality of the provision of good 1 on the production of the agent of that type increases.

Proposition 1 *When $q_t > \bar{q}(\phi_t^1, \phi_t^2)$, $g_t^{1,op}(\lambda_t) > g_t^1(\lambda_t)$, so $\lambda_{t+1} > \lambda_t$ when $c(\lambda_t, q_t) > 0$ and λ_t converges towards $\lambda^* = 1$. Alternatively, when $q_t < \bar{q}(\phi_t^1, \phi_t^2)$, $\lambda_{t+1} < \lambda_t$ when $c(\lambda_t, q_t) > 0$ and λ_t converges towards $\lambda^* = 0$.*

Proof. The proof is available in the Appendix. ■

Before studying the joint evolution of culture and institutions, we need to establish a last intermediate result. Combining (11) and Lemma 1, we can show the following result:

Proposition 2

- *There exists a unique function $q^*(\lambda_t)$ such that when $q_t > q^*(\lambda_t)$, $q_{t+1} > q_t$ and q_t converges towards $q^* = 1$. When $q_t < q^*(\lambda_t)$, $q_{t+1} < q_t$ and q_t converges towards $q^* = 0$*

- $q^*(\lambda_t)$ decreases with λ_t and with ϕ_t^1 , and increases with ϕ_t^2 .

Proof. The proof is available in the Appendix. ■

The preceding two propositions establish that, when the fraction of agents of type 1 is sufficiently high, institutions will evolve over time, so as to enable higher levels of the provision of public good 1. In turn, this generates a complementary feedback loop between the fraction of type 1 agents and more political power to type 1 elites in the dynamic transition of the model to one of the two non-ergodic states.

2.3 Joint Dynamics when Elites and the Ruler are Not forward-looking

The dynamics of culture and institutions in this society will in general be *non-ergodic*: which stationary state they will converge to in the long-run depends on the initial conditions. The joint evolution of culture and institutions display two types of stationary states. In the first equilibrium, society ends up in a steady state where the elite agents valuing the production of good 1 have a high political strength and the cultural composition of the population complements the provision of good 1, i.e. there are only type one individuals. In the second equilibrium, elite agents are only of type 2 in the long-run, only good 2 is provisioned, and the population adopts the cultural type 2.¹¹

The joint cultural and institutional dynamics are represented in the phase diagram in Figure 1. Two mechanisms characterize the dynamics. In region II of the figure, culture and institutions are complements: institutional change devolving power to type 1 elites increases the provision of good 1, which reinforces the incentives of parents of type 1 to transmit their values. In turn, a higher fraction of agents of type 1 augments the institutional structure so as to empower the type 1 elites, since the externalities associated with their provision of good 1 are greater. Once a society is in region II, if the rate of return ϕ_t^1 and ϕ_t^2 stay fixed, a society will end up in the long-run in the equilibrium represented by the point A where $q^* = 1$ and $\lambda^* = 1$. Similarly in the region III, the empowerment of the type 2 elites complements the diffusion of cultural norms of type 2, and the society will end up in the long-run in the equilibrium represented by point B , where $q^* = 0$ and $\lambda^* = 0$.

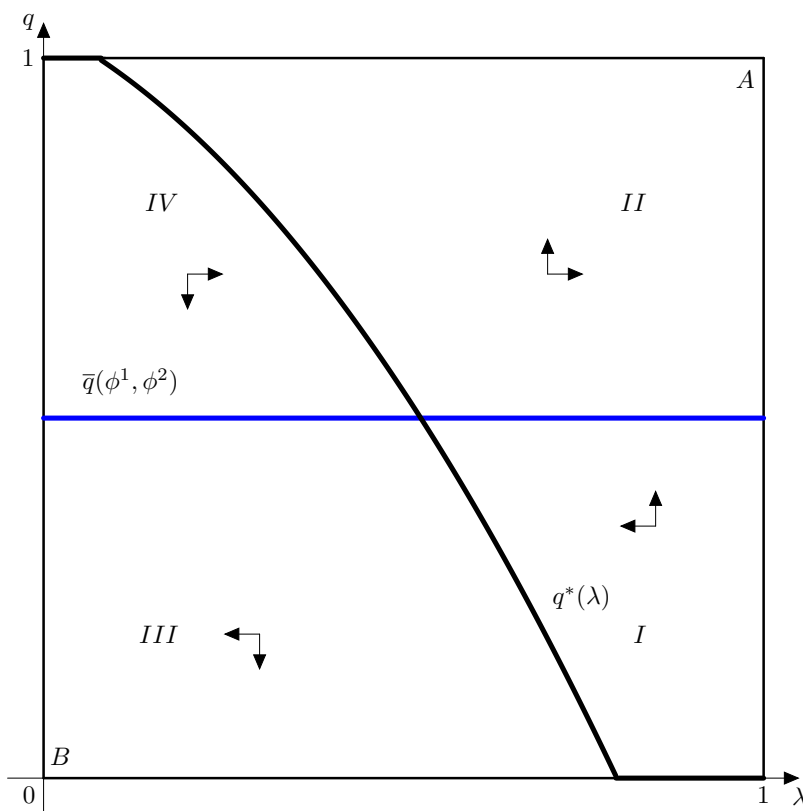
In region IV, there is no complementarity between institutions and culture. The society is on a transitory path where there are already sufficiently many agents of type 1 so that institutions change so as to empower the type 1 elites (i.e. $q_t > \bar{q}$). However, the level of provision of good 1 is still low enough in that the fraction of agents of type 1 decreases over time (i.e. $q_t < q^*(\lambda_t)$). Depending on the frictions in institutional change,

¹¹One could easily introduce some “leakage” into the cultural transmission process, as defined by equations (11) and (12), such that, in the two steady states, both types exist and neither type completely disappears. In particular, consider a revised version of (11) where, due to population growth or spontaneous cultural conversions, a fraction of types of a given cultural trait is maintained in every period. Then, in the steady state, both types 1 and 2 will exist, even though the dynamics favor one type over the other (see, for example, Iyigun and Kimball (2018)).

the society can either evolve toward the equilibrium A or B .

Finally in region I, there is also no complementarity between institutions and culture. There are not enough agents of type 1 for institutions to change so as to provide more of that good, and hence institutions change so as to empower type 2 elites. However, the provision of good 1 is sufficient for the share of agents of type 1 to grow over time. Again, the society is on a transitory path, and depending on the frictions in institutional change, it can either converge toward equilibrium A or toward equilibrium B .

Figure 1: Joint Dynamics of Culture and Institutions when Elites are Not forward-looking



3 Conservative Revivals

The model indicates that culture and institutions may interact in ways that affect their long-run trajectories. In this section, we reveal that one implication of this interaction is that, when faced with a shock which increases the returns to production in one sector of the economy (e.g., an increase in ϕ_t^2), a *conservative revival* can occur in which culture and institutions favoring the *other* sector of the economy are strengthened. Before we return to the general case we established at the outset, where elites are forward looking so that

$\delta^i > 0$ and the model can generate conservative revivals, we provide a few brief illustrations.

Conservative revivals are often associated with the ascendance of religious elites. Bénabou, Ticchi and Vindigni (2016) find that governments are more likely to block innovations in highly religious societies, in the process permitting unquestioned dogma and high spending on religious public goods as part of a “theocratic equilibrium.” Squicciarini (2018) 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. Similar mechanisms are found in Carvalho (2013), who provides a theory for the rise of veiling in Muslim countries in response to modernization, and Berman (2000), and Carvalho and Koyama (2016), who provide insight into the rise of religious education in response to an increase in secular market opportunities among Ultra-Orthodox Jews.¹²

Conservative revivals need not be associated with solely religious elites, however. Iyigun and Rubin (2017) cite three cases of macro-level “conservative 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 conservative 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), which we denoted as 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. This latter group would have seen their returns rise immensely with the adoption of Western technologies, education, and institutions (and the associated increase in ϕ_t^2). Yet, in *each of these cases*, the reaction to the West was what we call a “conservative revival”: cultural values associated with a past age (and favoring the established elites) became more predominant in society, and institutions did not change to accommodate the new economic realities. We provide more detail for each of these cases in Appendix B.

In all three of these examples, one sector of the economy had the potential to become more 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 1981). These societies all turned their backs on a more efficient economy, instead turning to a more traditional, less efficient one. Moreover, institutional stagnation due to vested interests cannot fully explain these phenomena (e.g.,

¹²For a more general theory on backlash in the presence of religious elites—which can result in radicalization—see Carvalho and Sacks (2018).

Acemoglu and Robinson 2000b; 2006), since they do not explain why the broader culture also became more conservative. In this section, we employ the framework laid out in Section 2 to shed light on how the joint evolution of culture and institutions can result in conservative revivals.

In order to understand why conservative revivals emerge, we now relax the assumption from Section 2.3 that the elites are not forward-looking. Hence, as we exposited at the outset, we once again have $\delta > 0$ and $\delta^i > 0$, for $i \in \{1, 2\}$. This means that the ruler and the elites care about both the current and the future levels of provision of public goods. Assuming that the ruler and elites are forward-looking allows us to study how current political choices endogenously affect cultural change in the future, while cultural change affects institutions and thus the future provision of public goods.

As a preliminary example, take the case of a society that is initially on the path toward an equilibrium where the agents steadily become type 1, and the institutions evolve so as to delegate an increasing fraction of political power to the type 1 elites (i.e., in region II of the phase diagram in Figure 1). However, imagine that an important innovation arises exogenously that affects the rate of return of agents of type 2, so that, in some period $t + 1$, ϕ_{t+1}^2 increases relative to ϕ_t^2 . For instance, we might consider Western technologies being introduced to the rest of the world in the wake of the Industrial Revolution, as in some of the examples provided at the beginning of this section.

Will this society change its provision of public goods—and its trajectory of cultural and institutional change—so as to take advantage of the new innovation that has emerged elsewhere? Or might we observe at the opposite end a *conservative revival*, in that the cultural norms associated with type 1 become *more* preponderant after the innovation, and the institutions that complement those norms are strengthened? This section will demonstrate that, based on parameter values, a *conservative revival* could be a natural reaction of societies to external innovations.

The socially-committed equilibrium policy verifies the following first-order equation:

$$\lambda_t v'(g_t^1) - (1 - \lambda_t) \frac{1 - \tau q_t \phi_t^1}{1 - \tau(1 - q_t) \phi_t^2} v'(g_t^2) + G(q_t) = 0, \quad (22)$$

with

$$\begin{aligned} G(q_t) = & [\beta\tau + (1 - \beta)(1 - \tau)] \frac{q_t \phi_t^1 - (1 - q_t) \phi_t^2}{1 - \tau(1 - q_t) \phi_t^2} + \\ & \delta^1 \lambda_t (1 - \beta) \frac{\partial g_{t+1}^1}{\partial q_{t+1}} v'(g_{t+1}^1) \frac{\partial q_{t+1}}{\partial g_t^1} + \delta^2 (1 - \lambda_t) (1 - \beta) \frac{\partial g_{t+1}^2}{\partial q_{t+1}} v'(g_{t+1}^2) \frac{\partial q_{t+1}}{\partial g_t^1} + \\ & \beta \delta \left\{ \frac{\partial r_{t+1}}{\partial q_{t+1}} \frac{\partial q_{t+1}}{\partial g_t^1} \right\}, \quad (23) \end{aligned}$$

and

$$\frac{\partial r_{t+1}}{\partial q_{t+1}} = \tau[\{\phi_{t+1}^1 g_{t+1}^1 - \phi_{t+1}^2 g_{t+1}^2\} + q_{t+1} \phi_{t+1}^1 \frac{\partial g_{t+1}^1}{\partial q_{t+1}} + (1 - q_{t+1}) \phi_{t+1}^2 \frac{\partial g_{t+1}^2}{\partial q_{t+1}}]. \quad (24)$$

Since the elites are forward-looking, they have an incentive to increase the provision of their preferred public good, because this will positively affect the fraction of agents with the related cultural norms. The marginal provision of public goods relative to the case with no forward-looking elites can be interpreted as an *indoctrination* effort, which aims at affecting the future rents of the elites by changing the cultural composition of the population.

Formally, the policy choice in period t internalizes the effect of the current policy on the future cultural composition of the population q_{t+1} . In turn, the effects of q_{t+1} on the future level of provision of good g_{t+1}^1 and good g_{t+1}^2 are internalized. This effect is given by the second and third lines in (23). Observe that this is true independently from the realization of q_{t+1} , which in turn depends on the expectations of the elite agents in period t . Indeed, multiplicity arises from self-fulfilling expectations of the elite agents, as in Bisin and Verdier (2000).

The second line of (23) describes the marginal effect of a higher provision of good 1 on the future rents of the elites. Since both $\frac{\partial q_{t+1}}{\partial g_t^1} > 0$ and $\frac{\partial g_{t+1}^1}{\partial q_{t+1}} > 0$ (see (11) and Lemma 1), when the elites of type 1 are forward-looking, then the first term in the second line of (23) is positive. Intuitively, the elites of type 1 anticipate that increasing the provision of good 1 in period t will positively affect the fraction of type 1 agents in the next period. In turn, this will positively affect their own utility in the next period $v(g_{t+1}^1)$, as g_{t+1}^1 increases with q_{t+1} . Alternatively, the elites of type 2 anticipate that a higher provision of good 1 in period t will increase the fraction of type 1 agents, and that this will negatively affect the provision of good 2 in the next period. Consequently, forward-looking elites have conflicting interests. While the elites of type 1 have an interest in increasing the provision of good 1 in period t so as to spur the diffusion of cultural trait 1 and their future rents, the elites of type 2 prefer the opposite. Which effect dominates depends on the political strength of the two types of elites, as we establish next.

Finally, the third line of (23) describes the marginal effect of a higher provision of good 1 on the future rents of the ruler. Not surprisingly, from (24), the ruler has an interest in reinforcing—by means of indoctrination—the cultural trait that allows him to generate more rents in the future period.

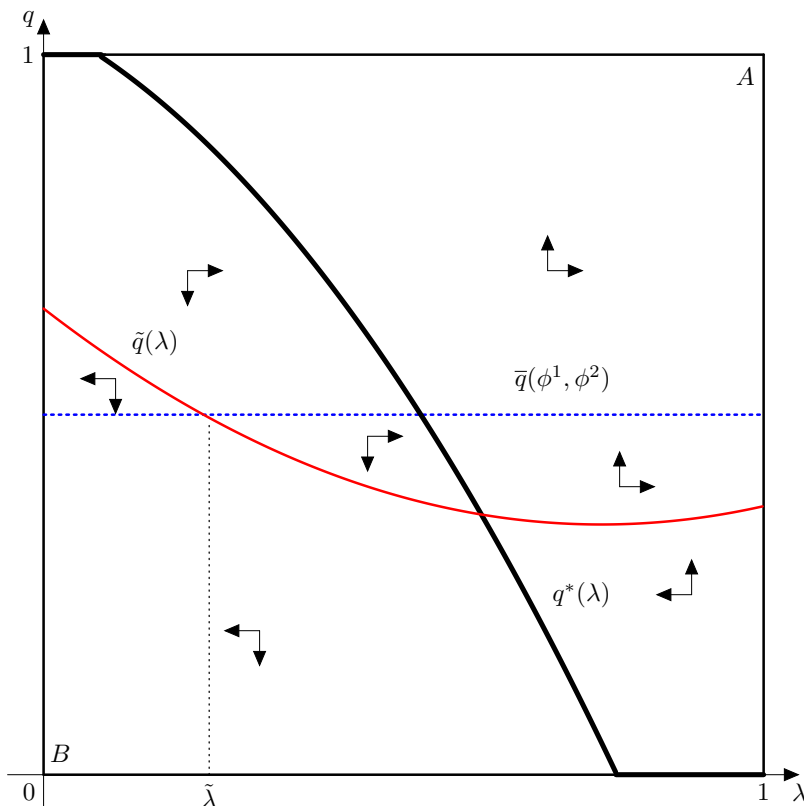
Proposition 3 *There exists a unique $\tilde{\lambda}$ such that, if $\lambda_t > \tilde{\lambda}$, then the indoctrination effort of type 1 elites dominates in social choice in that there exists a unique function $\tilde{q}(\lambda) < \bar{q}(\phi_t^1, \phi_t^2)$ such that if $q_t > \tilde{q}$, then $g_t^{1,op}(\lambda) > g_t^1(\lambda)$. If $\lambda_t < \tilde{\lambda}$, then the indoctrination effort of type 2 elites dominates in social choice, as there exists a unique function $\tilde{q}(\lambda) < \bar{q}(\phi_t^1, \phi_t^2)$ such that if $q_t > \tilde{q}$, then $g_t^{1,op}(\lambda) > g_t^1(\lambda)$.*

Proof. The proof is available in the Appendix. ■

When type 1 elites are sufficiently powerful, in that $\lambda_t > \tilde{\lambda}$, indoctrination makes the provision of good 1 more valuable in social choice. As a result, institutions change so as to accommodate a higher provision of that good. This means that type 1 elites gain more political power than in the case where the elites are not forward-looking.

Indeed, when the elites are not forward-looking, type 1 elites gain an increasing share of power when $q_t > \bar{q}(\phi_t^1, \phi_t^2)$. When the elites are forward-looking and the indoctrination effort of type 1 elites dominates in social choice, the threshold is shifted down, $\tilde{q}(\lambda) < \bar{q}(\phi_t^1, \phi_t^2)$, as represented in Figure 2. A lower fraction of type 1 individuals is sufficient for type 1 elites to gain power. Symmetrically, when $\lambda_t < \tilde{\lambda}$, then the higher indoctrination effort of elites of type 2 implies that institutions should change so as to delegate power to type 2 elites for a larger set of parameters.

Figure 2: Joint Dynamics of Culture and Institutions when the Elites are forward-looking



In order to evaluate how societies react to external innovation that increases the rate of return ϕ^2 , we assume that the agents know that in period $t + 1$, the rate of return of agents of type 2 will increase. For instance, in the examples given at the beginning of this section, it was widely known that Western innovations were steadily diffusing throughout the world, and thus the traditional elites (i.e., type 1) must

have anticipated in period t that $\phi_{t+1}^2 > \phi_t^2$ in the non-traditional sectors of the economy. How should this affect the joint dynamics of culture and institutions?

From (23), we deduce that

$$\begin{aligned} \frac{\partial G(q_t)}{\partial \phi_{t+1}^2} = & \delta^1(1-\beta)\lambda_t \left[\frac{\partial q_{t+1}}{\partial g_t^1} \frac{\partial g_{t+1}^1}{\phi_{t+1}^2} v''(g_{t+1}^1) + \frac{\partial^2 g_{t+1}^1}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^1) \right] \\ & + \delta^2(1-\beta)(1-\lambda_t) \left[\frac{\partial q_{t+1}}{\partial g_t^1} \frac{\partial g_{t+1}^2}{\phi_{t+1}^2} v''(g_{t+1}^2) + \frac{\partial^2 g_{t+1}^2}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^2) \right] + \\ & \beta \delta \frac{\partial^2 r_{t+1}}{\partial \phi_{t+1}^2 \partial q_{t+1}} \frac{\partial q_{t+1}}{\partial g_t^1}. \end{aligned} \quad (25)$$

The full expression of (25) is provided in the Appendix before the proof of Proposition 4. The two first lines describe how the incentive of the forward-looking elites to provision good 1 is affected by an increase in ϕ_{t+1}^2 , while the last line relates to the effect of a higher ϕ_{t+1}^2 on the future rents of the (forward-looking) ruler.

Under certain conditions that we establish next, it can be that $\frac{\partial G(q_t)}{\partial \phi_{t+1}^2} > 0$, meaning that an innovation affecting ϕ^2 leads to an increase in the marginal benefit of provisioning good 1. In turn, this implies that institutions will delegate *more* power to the type 1 elites when an innovation affecting ϕ^2 is expected to diffuse. This is the phenomenon which we have defined as a *conservative revival*.

From (25), we can establish that conservative revivals are relatively robust phenomena that can dramatically affect the joint dynamics of culture and institutions. The emergence of a revival is sustained by the following two mechanisms.

First, when an innovation affecting ϕ^2 is expected to diffuse in period $t+1$, the type 1 elites know that this will tend to reduce g_{t+1}^1 , i.e. the innovation will reduce in the next period the provision of the good that they value. Therefore, the type 1 elites have a higher marginal benefit of increasing g_t^1 in period t , so as to increase the effort of transmission of the parents of type 1 and to decrease that of the agents of type 2. The type 1 elites then counter the emergence of a new innovation in sector 2 in the next period by promoting a larger provision of good 1 in the current period. This effect is formally given by the first term in the first line of (25), which is necessarily positive. The sign of the second term in the first line of (25) is ambiguous in the general case, although it is positive under some conditions provided in the Appendix. When those conditions are fulfilled, from Proposition 3, we deduce that an innovation affecting ϕ_t^2 necessarily triggers a higher provision of good 1 when the type 1 elites are sufficiently powerful (i.e. λ_t is sufficiently high).

Second, regarding the second line of (25), notice that the incentive of forward-looking type 2 elites to provide good 2 can be *negatively* affected by an expected innovation increasing the returns to good 2 provision. Indeed, if the type 2 elites expect an innovation affecting ϕ_t^2 in the next period, they can relax their provision of public goods in the current period, because they know that the diffusion of the innovation

will lead to a higher provision levels of good 2 in the next period anyway. This effect is formally given by the first term in the second line of (25), which is necessarily positive. The second term in the second line of (25) has an ambiguous sign in the general case, and we can thus not make a strong prediction. Hence, given the mechanism previously described, type 1 elites being more politically powerful is not always a necessary condition for the emergence of conservative revivals.

Finally, relative to the last line of (25), the incentive of the forward-looking ruler to provide good 1 in period t is expected to be negatively affected by an expected innovation that increases the returns of good 2 in period $t + 1$, although second-order effects again make a prediction difficult in the general case. Indeed, abstracting from second-order effects (see Appendix A.5), when choosing an indoctrination effort, the ruler compares whether an additional type 1 individual will generate more rents than an additional type 2 individual in the next period. Consequently, an increase in ϕ_{t+1}^2 should make the ruler relatively more favorable to type 2 individuals in his political choices, as this will increase his future rents. Vested interests between elites and production are therefore necessary to generate a *conservative revival*, as rulers maximizing their rents tend not to oppose the course of technical change in their policy choices.

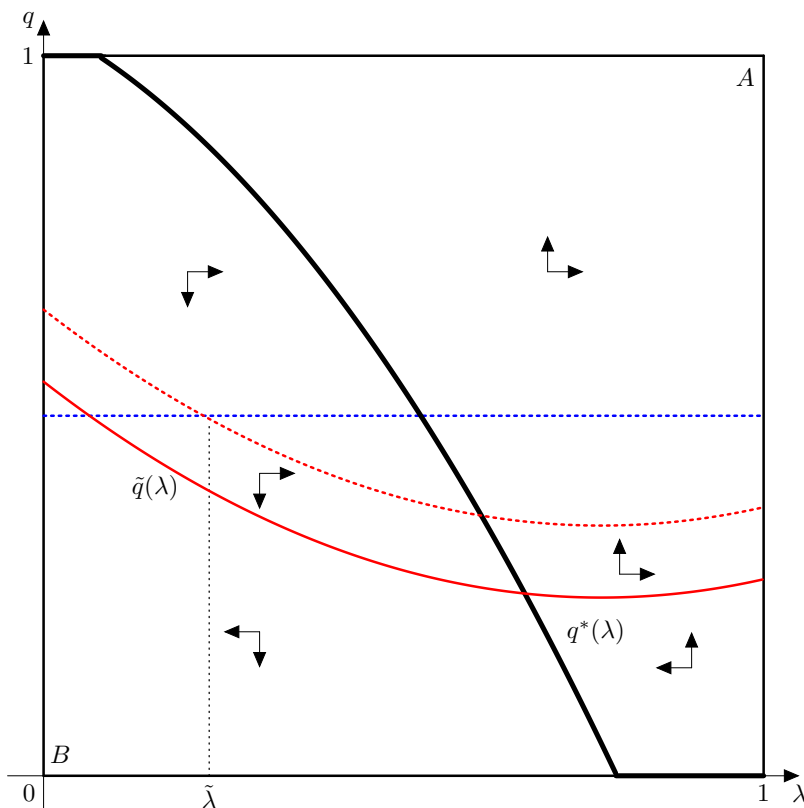
Proposition 4

- *When a sufficiently important innovation of type 2 is expected to diffuse, a society experiences a conservative revival when the type 1 elites are sufficiently strong (i.e. λ_t is high), the good 1 technology is weak (i.e. ϕ_t^1 is low), the elites are strong relative to the ruler (i.e. β is low) and $v(\cdot)$ is sufficiently concave.*
- *Conservative revivals are not necessarily ruled out in societies where type 1 elites are not powerful.*
- *A conservative revival can be temporary. Alternatively, a society that could initially have converged toward equilibrium B (i.e., where $q^* = \lambda^* = 0$) without a technological breakthrough, can experience a conservative revival with such a breakthrough that traps the economy on a path where type 1 values and institutions are built (i.e., where $q^* = \lambda^* = 1$).*

Proof. The proof is available in the Appendix. ■

The expected innovation increases the incentive of type 1 elites to indoctrinate the population by provisioning more type 1 goods in the current period. It could also concomitantly decrease the incentives of the type 2 elites to indoctrinate the masses. In turn, this implies that institutions change so as to delegate more power to type 1 elites. The main intuition of Proposition 4 is represented in Figure 3. The function $\lambda \rightarrow \tilde{q}(\lambda)$ is shifted downwardly from the red dotted curve to the red solid curve when $\phi_{t+1}^2 > \phi_t^2$.

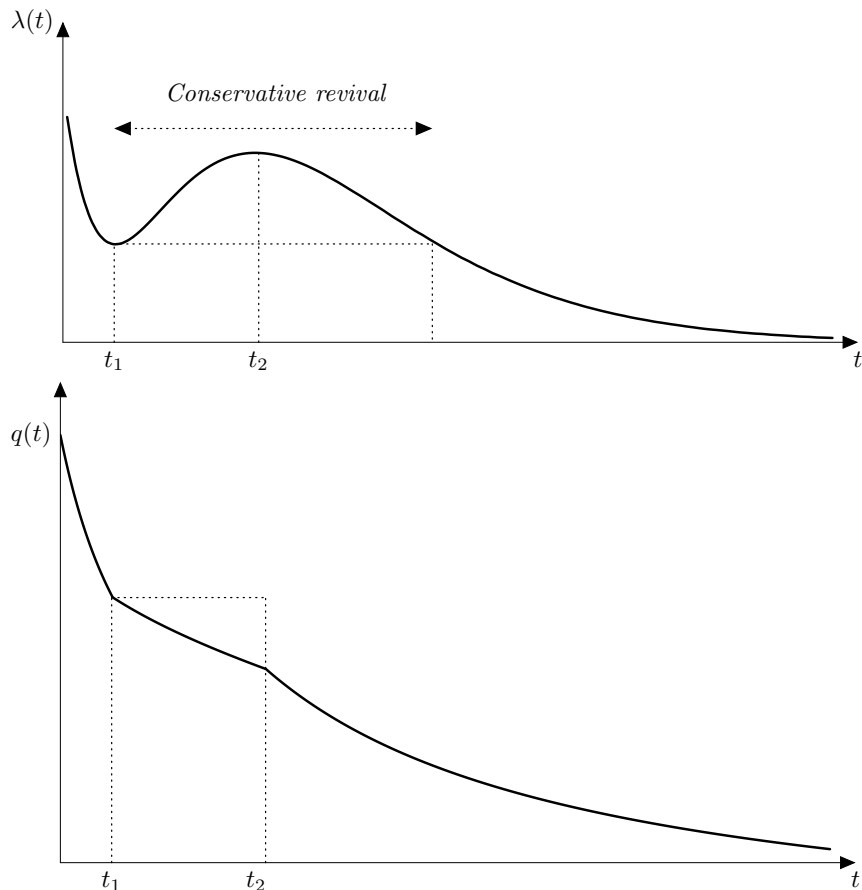
Figure 3: Conservative Revivals and the Joint Dynamics of Culture and Institutions



Societies that initially have institutions and cultural norms that belong to the area to the left of the red dotted line and to the right of the bold red line in period t in Figure 3 can experience a conservative revival. Prior to the technological change, societies in the region to the left of the bold black line and in between the two red lines would have eventually converged to equilibrium B , where agents have cultural preferences of type 2 and all political power is held by type 2 elites. However, after an improvement in ϕ^2 , the long-run equilibrium is ambiguous, and in some cases it converges to equilibrium A . On the other hand, the long-run path of societies to the right of the bold line (and in between the two red lines) prior to the change in ϕ^2 is ambiguous, with some societies converging to equilibrium B . However, after the change in ϕ^2 , these societies unambiguously converge to equilibrium A .

We represent in Figure 4 a case in which the revival is temporary. The revival starts in some period t_1 when a modern technology is expected. Institutions then change so as to provide more political power to the type 1 elites. Yet the resulting provision levels of the good 1, although higher than before, still do not allow for the type 1 cultural values to increase. If institutional change is slow relative to cultural change, this society will eventually cross the threshold where type 1 values become minoritarian in some period t_2 ,

Figure 4: Temporary Revival

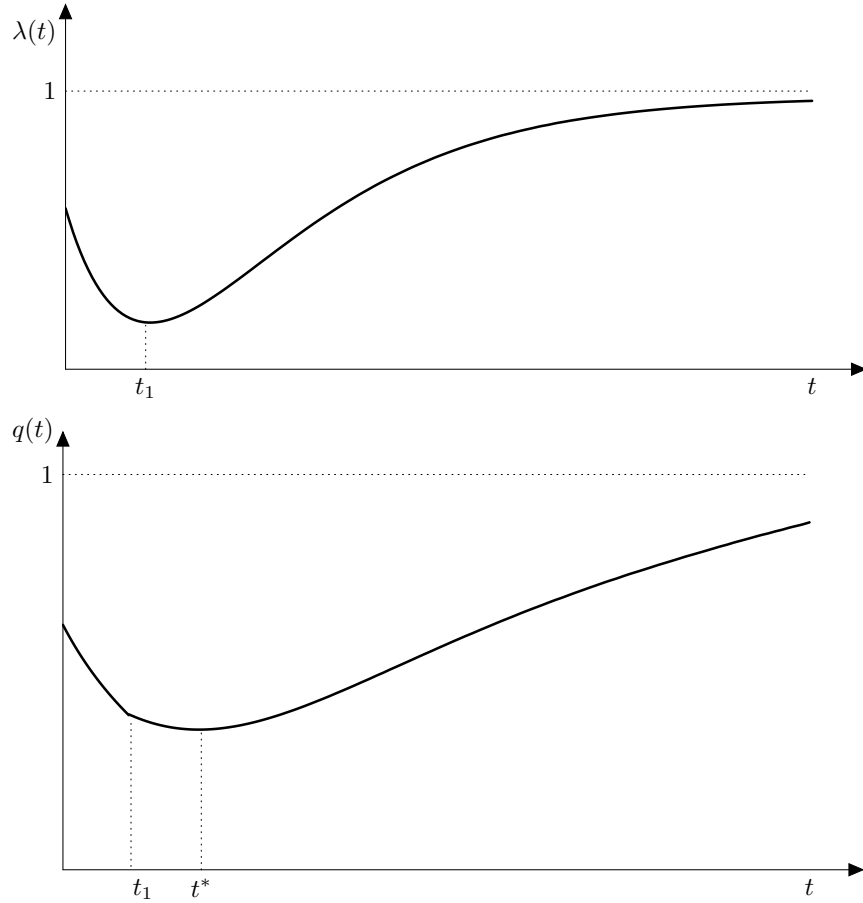


and the institutions again start to change so as to reduce the power of the type 1 elites. We posit that such a temporary revival arose in Japan in the late Tokugawa period (see Appendix B). Beginning in the mid-19th century, institutions began to change to reduce the power of the old samurai elites, while cultural values and institutions favoring Western techniques reinforced each other during the Meiji Restoration.

Figure 5 provides a case where the revival is permanent. As before, when the revival starts, institutions evolve so as to delegate political power to the type 1 elites. The resulting provision levels of the good 1 are low initially, so that the type 1 values continue to decrease. However, institutions can change relatively quickly—when the frictions in institutional change are low—in which case type 1 cultural values could start to increase after some period t^* . The society then becomes trapped in a new trajectory triggered by the revival. Along this new trajectory, institutions continue to change so as to increase the political power of the type 1 elites, and type 1 cultural values diffuse in the population.

These insights help explain why reforms in the Ottoman Empire and Imperial China continued to be backwards-looking until it was “too late.” The political power of the established elites (religious authorities

Figure 5: Permanent Revival



and local notables in the Ottoman Empire, bureaucrats in the Qing Empire), and the cultural capital complementary to their power, reinforced each other to the point where any reform would have taken place under a cultural setting favoring the “old way” of doing things. This equilibrium was self-reinforcing and was only escaped with the collapse of these empires.

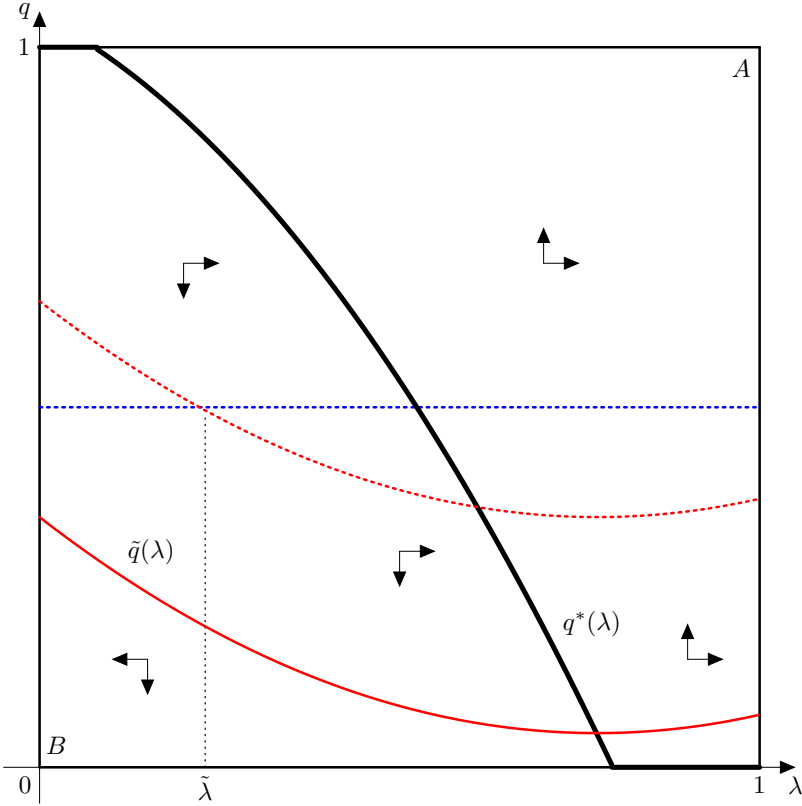
A conservative revival initially increases the wedge between the institutions and the prevailing cultural norms. Therefore, institutions become initially less efficient at complementing the prevailing mode of production, thereby leading to an economic decay. Interestingly, this shortcoming of revivals is not necessarily persistent. Indeed, when the institutions revert to their initial trajectory—when the revival is temporary—the aggregate production reverts as well to its initial increasing trend. Furthermore, when the revival is permanent, the existence of a complementarity between conservative norms and the diffusion of conservative institutions could eventually imply higher production levels *after the revival*, once the conservative institutions and the conservative values are sufficiently widespread.

Finally, a corollary of the above discussion is that too much technology diffusion significantly increases

the incentive of the type 1 elites to oppose it, for a given value of their political power λ_t . This is represented in Figure 6. Relative to Figure 3, we see that the threshold above which the revival occurs is shifted downwards. Therefore, a society that is non-conservative initially can experience a revival after a major modern technological breakthrough. In this, our model relates to some contemporary political and economic developments in industrialized as well as developing countries, such as the United States, the United Kingdom, Italy, Turkey, Hungary and Brazil, where political backlash to economic integration and globalization had strong populist connotations, but also involved elites with vested interests in a culturally-rooted status quo.

Corollary 1 *Too much technology diffusion too soon can lead to a conservative revival in societies that are not conservative.*

Figure 6: Major Technological Breakthrough and Conservative Revivals



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. We propose an explanation that highlights the interplay—or lack thereof—between productivity, cultural beliefs, and institutions. In our model, production shocks that benefit one sector of the economy may induce forward-looking elites to provision public goods associated with a *different*, more traditional 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 political power of the traditional elite. Hence, productivity shocks in a more advanced sector of the economy can increase investment, political power, and 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. In general, our insights suggest that institutional reforms will not likely achieve their desired results unless they trigger an update in cultural capital that is more suitable for the changing economic environment. In fact, such institutional reforms can have the *opposite* of the intended effect, triggering a conservative revival that makes the institutional reforms all the less effective.

References

- Acemoglu, Daron. 2003. “Why not a Political Coase Theorem? Social Conflict, Commitment, and Politics.” *Journal of Comparative Economics* 31(4):620–652.
- Acemoglu, Daron and James A. Robinson. 2000*a*. “Political Losers as a Barrier to Economic Development.” *American Economic Review* 90(2):126–130.
- Acemoglu, Daron and James A. Robinson. 2000*b*. “Why Did the West Extend the Franchise? Democracy, Inequality, and Growth in Historical Perspective.” *Quarterly Journal of Economics* 115(4):1167–1199.
- Acemoglu, Daron and James A. Robinson. 2006. “Economic Backwardness in Political Perspective.” *American Political Science Review* 100(1):115–131.
- Acemoglu, Daron and James A. Robinson. 2012. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. Crown.
- Acemoglu, Daron and Matthew O. Jackson. 2017. “Social Norms and the Enforcement of Laws.” *Journal of the European Economic Association* 15(2):245–295.

- Acemoglu, Daron, Simon Johnson and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91(5):1369–1401.
- Acemoglu, Daron, Simon Johnson and James A. Robinson. 2005. "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth." *American Economic Review* 95(3):546–579.
- Akerlof, George A. and Rachel E. Kranton. 2000. "Economics and Identity." *Quarterly Journal of Economics* 115(3):715–753.
- Alesina, Alberto and Paola Giuliano. 2015. "Culture and Institutions." *Journal of Economic Literature* 53(4):898–944.
- Algan, Yann and Pierre Cahuc. 2014. Trust, Growth, and Well-being: New Evidence and Policy Implications. In *Handbook of Economic Growth*. Vol. 2 Elsevier pp. 49–120.
- Allen, George Cyril. 1981. *A Short Economic History of Modern Japan*. Saint Martin's Press.
- Alston, Lee J., Marcus André Melo, Bernardo Mueller and Carlos Pereira. 2016. *Brazil in Transition: Beliefs, Leadership, and Institutional Change*. Princeton University Press.
- Bénabou, Roland, Davide Ticchi and Andrea Vindigni. 2016. "Forbidden Fruits: The Political Economy of Science, Religion and Growth." *NBER Working Paper 21105*.
- Bénabou, Roland and Jean Tirole. 2011. "Identity, Morals, and Taboos: Beliefs as Assets." *Quarterly Journal of Economics* 126(2):805–855.
- Berman, Eli. 2000. "Sect, Subsidy, and Sacrifice: An Economist's View of Ultra-Orthodox Jews." *Quarterly Journal of Economics* 115(3):905–953.
- Bisin, Alberto, Jared Rubin, Avner Seror and Thierry Verdier. 2018. "Religious Legitimacy and the Long Divergence." *Working Paper*.
- Bisin, Alberto and Thierry Verdier. 2000. "A model of cultural transmission, voting and political ideology." *European Journal of Political Economy* 16(1):5 – 29.
- Bisin, Alberto and Thierry Verdier. 2001. "The Economics of Cultural Transmission and the Dynamics of Preferences." *Journal of Economic Theory* 97(2):298–319.
- Bisin, Alberto and Thierry Verdier. 2009. "Cultural Transmission." *The New Palgrave Dictionary of Economics*.
- Bisin, Alberto and Thierry Verdier. 2017. "On the Joint Evolution of Culture and Institutions." *NBER Working Paper No. 23375*.
- Blaydes, Lisa and Eric Chaney. 2013. "The Feudal Revolution and Europe's Rise: Political Divergence of the Christian West and the Muslim World before 1500 CE." *American Political Science Review* 107(1):16–34.
- Boyd, Robert and Peter J. Richerson. 1985. *Culture and the Evolutionary Process*. University of Chicago press.
- Brown, Shannon R. 1979. "The Ewo Filature: A Study in the Transfer of Technology to China in the 19th Century." *Technology and Culture* 20(3):550–568.
- Carvalho, Jean-Paul. 2013. "Veiling." *Quarterly Journal of Economics* 128(1):337–370.
- Carvalho, Jean-Paul and Mark Koyama. 2016. "Jewish Emancipation and Schism: Economic Development and Religious Change." *Journal of Comparative Economics* 44(3):562–584.
- Carvalho, Jean-Paul, Mark Koyama and Michael Sacks. 2017. "Education, Identity, and Community: Lessons from Jewish Emancipation." *Public Choice* 171(1-2):119–143.

- Carvalho, Jean-Paul and Michael Sacks. 2018. "The Economics of Religious Communities: Social Integration, Discrimination, and Radicalization." *Working Paper* .
- Cavalli-Sforza, Luigi Luca and Marcus W. Feldman. 1981. *Cultural Transmission and Evolution: A Quantitative Approach*. Princeton University Press.
- Chaney, Eric. 2016. "Religion and the Rise and Fall of Islamic Science." *Working Paper* .
- Chang, Chung-li. 1955. *The Chinese Gentry: Studies on Their Role in Nineteenth-century Chinese Society*. University of Washington Press.
- Chaudhary, Latika and Jared Rubin. 2016. "Religious Identity and the Provision of Public Goods: Evidence from the Indian Princely States." *Journal of Comparative Economics* 44(3):461–483.
- Chaudhry, Azam and Phillip Garner. 2006. "Political Competition between Countries and Economic Growth." *Review of Development Economics* 10(4):666–682.
- Coggel, Metin M., Thomas J. Miceli and Jared Rubin. 2012. "The Political Economy of Mass Printing: Legitimacy and Technological Change in the Ottoman Empire." *Journal of Comparative Economics* 40(3):357–371.
- Coggel, Metin and Thomas J. Miceli. 2009. "State and Religion." *Journal of Comparative Economics* 37(3):402–416.
- Dale, Stephen F. 2010. *The Muslim Empires of the Ottomans, Safavids, and Mughals*. Vol. 5 Cambridge University Press.
- David, Paul A. 1994. "Why are Institutions the Carriers of History?: Path Dependence and the Evolution of Conventions, Organizations and Institutions." *Structural Change and Economic Dynamics* 5(2):205–220.
- de la Croix, David, Matthias Doepke and Joel Mokyr. 2018. "Clans, Guilds, and Markets: Apprenticeship Institutions and Growth in the Preindustrial Economy." *Quarterly Journal of Economics* 133(1):1–70.
- Duus, Peter. 1976. *The Rise of Modern Japan*. Houghton Mifflin.
- Fouka, Vasiliki. 2018. "Backlash: The Unintended Effects of Language Prohibition in US Schools after World War I." *Working Paper* 591.
- Gill, Anthony. 1998. *Rendering Unto Caesar: The Catholic Church and the State in Latin America*. University of Chicago Press.
- Giuliano, Paola and Nathan Nunn. 2017. "Understanding Cultural Persistence and Change." *NBER Working Paper No. 23617* .
- Goren, Paul and Christopher Chapp. 2017. "Moral Power: How Public Opinion on Culture War Issues Shapes Partisan Predispositions and Religious Orientations." *American Political Science Review* 111(1):110–128.
- Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge University Press.
- Greif, Avner and David D. Laitin. 2004. "A Theory of Endogenous Institutional Change." *American Political Science Review* 98(4):633–652.
- Greif, Avner and Jared Rubin. 2018. "Political Legitimacy and the Institutional Foundations of Constitutional Government: The Case of England." *Working paper* .
- Greif, Avner, Paul Milgrom and Barry R. Weingast. 1994. "Coordination, Commitment, and Enforcement: The Case of the Merchant Guild." *Journal of Political Economy* pp. 745–776.
- Guiso, Luigi, Paola Sapienza and Luigi Zingales. 2006. "Does Culture affect Economic Outcomes?" *Journal of Economic Perspectives* 20(2):23–48.

- Hauk, Esther and Hannes Mueller. 2015. "Cultural Leaders and the Clash of Civilizations." *Journal of Conflict Resolution* 59(3):367–400.
- Henrich, Joseph. 2015. *The Secret of our Success: How Culture is Driving Human Evolution, Domesticating our Species, and Making us Smarter*. Princeton University Press.
- Hoffman, Philip T. 2015. *Why did Europe Conquer the World?* Princeton University Press.
- Howard, Douglas A. 1988. "Ottoman Historiography and the Literature of "Decline" of the Sixteenth and Seventeenth Centuries." *Journal of Asian History* 22(1):52–77.
- Imber, Colin. 2016. "Koçi Beg/Gördidjeli Kodja Mustafa Beg." *Encyclopedia of Islam II (Brill)* .
- Iyigun, Murat. 2015. *War, Peace, and Prosperity in the Name of God: The Ottoman Role in Europe's Socioeconomic Evolution*. University of Chicago Press.
- Iyigun, Murat and Jared Rubin. 2017. "The Ideological Roots of Institutional Change." *Working Paper* .
- Iyigun, Murat and Miles Kimball. 2018. "Markov Modeling of Cultural Evolution: an Application to Theistic Dynamics." *University of Colorado at Boulder, unpublished mimeo* .
- Jansen, Marius B. 2000. *The Making of Modern Japan*. Harvard University Press.
- Kuran, Timur. 2010. "Institutional Causes of Economic Underdevelopment in the Middle East: a Historical Perspective." *Research of Institutional Economics* 3:16.
- Kuran, Timur. 2011. *The Long Divergence: How Islamic Law Held Back the Middle East*. Princeton University Press.
- Ma, Debin. 2004. "Why Japan, not China, was the First to Develop in East Asia: Lessons from Sericulture, 1850–1937." *Economic Development and Cultural Change* 52(2):369–394.
- Ma, Debin. 2005. "Between Cottage and Factory: The Evolution of Chinese and Japanese Silk-Reeling Industries in the Latter Half of the Nineteenth Century." *Journal of the Asia Pacific Economy* 10(2):195–213.
- McCloskey, Deirdre N. 2010. *Bourgeois Dignity: Why Economics Can't Explain the Modern World*. University of Chicago Press.
- McCloskey, Deirdre N. 2016. *Bourgeois Equality: How Ideas, not Capital or Institutions, Enriched the World*. University of Chicago Press.
- Milgrom, Paul R., Douglass C. North and Barry R. Weingast. 1990. "The Role of Institutions in the Revival of Trade: The Law Merchant, Private Judges, and the Champagne Fairs." *Economics & Politics* 2(1):1–23.
- Mokyr, Joel. 2010. *The Enlightened Economy: An Economic History of Britain, 1700-1850*. Yale University Press.
- Mokyr, Joel. 2016. *A Culture of Growth: The Origins of the Modern Economy*. Princeton University Press.
- North, Douglass C. 1981. *Structure and Change in Economic History*. Norton.
- North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- North, Douglass C. 1991. "Institutions." *Journal of Economic Perspectives* 5(1):97–112.
- North, Douglass C., John Joseph Wallis and Barry R. Weingast. 2009. *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. Cambridge University Press.
- North, Douglass C. and Robert Paul Thomas. 1973. *The Rise of the Western World: A New Economic History*. Cambridge University Press.

- Nunn, Nathan. 2012. “Culture and the Historical Process.” *Economic History of Developing Regions* 27(sup1):S108–S126.
- Platteau, Jean-Philippe. 2017. *Islam Instrumentalized: Religion and Politics in Historical Perspective*. Cambridge University Press.
- Prendergast, Canice and Lars Stole. 1996. “Impetuous Youngsters and Jaded Old-timers: Acquiring a Reputation for Learning.” *Journal of Political Economy* 104(6):1105–1134.
- Prummer, Anja and Jan-Peter Siedlarek. 2017. “Community Leaders and the Preservation of Cultural Traits.” *Journal of Economic Theory* 168:143–176.
- Rodrik, Dani, Arvind Subramanian and Francesco Trebbi. 2004. “Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development.” *Journal of Economic Growth* 9(2):131–165.
- Rubin, Jared. 2011. “Institutions, the Rise of Commerce and the Persistence of Laws: Interest Restrictions in Islam and Christianity.” *Economic Journal* 121(557):1310–1339.
- Rubin, Jared. 2017. *Rulers, Religion, and Riches: Why the West Got Rich and the Middle East Did Not*. Cambridge University Press.
- Seror, Avner. 2018. “A Theory on the Evolution of Religious Norms and Economic Prohibition.” *Journal of Development Economics* 134:416–427.
- Shaw, Stanford J. 1976. *History of the Ottoman Empire and Modern Turkey*. Cambridge University Press.
- Spolaore, Enrico and Romain Wacziarg. 2013. “How Deep are the Roots of Economic Development?” *Journal of Economic Literature* 51(2):325–69.
- Squicciarini, Mara. 2018. “Devotion and Development: Religiosity, Education, and Economic Progress in 19th-Century France.” *Working Paper* .
- Tilly, Charles. 1990. *Coercion, Capital, and European States, AD 990–1990*. Blackwell.
- Verdier, Thierry and Yves Zenou. 2018. “Cultural Leader and the Dynamics of Assimilation.” *Journal of Economic Theory* 175:374–414.
- Wright, Mary C. 1957. *The Last Stand of Chinese Conservatism: The Tung-Chih Restoration, 1862-1874*. Atheneum.

Appendices

A Proofs

A.1 Proof of Proposition 1

$q_{t+1} > q_t$ as long as $\phi^1 g^1 > \phi^2 g^2$. As g^1 increases with q , while g^2 decreases with the same parameter (Lemma 1), there exists a unique function $q^*(\lambda)$ such that when $q_t > q^*(\lambda)$, $q_{t+1} > q_t$. $q^*(\lambda)$ decreases with λ , because g^1 increases with λ , while g^2 decreases.

A.2 Proof of Lemma 2

Using the expression of U_t^i in (2) and r_t in (3), it is easy to show that

$$G_0(q_t) = [\beta\tau + (1 - \beta)(1 - \tau)] \frac{q_t\phi_t^1 - (1 - q_t)\phi_t^2}{1 - \tau(1 - q_t)\phi_t^2}, \quad (\text{A.1})$$

so $G_0(q_t)$ is positive as long as $q_t > \bar{q}(\phi_t^1, \phi_t^2) = \phi_t^2/(\phi_t^1 + \phi_t^2)$.

If $G_0(q_t)$ is positive, then the marginal benefit at provisioning good 1 is higher in the socially committed equilibrium than in the societal equilibrium. This implication is direct when comparing the first-order conditions (15) and (18). It follows that as long as $G_0(q_t) > 0$ then $g_t^{1,op}(\lambda_t) > g_t^1(\lambda_t)$ and $g_t^{2,op}(\lambda_t) < g_t^2(\lambda_t)$.

A.3 Proof of Proposition 2

From Lemma 2, we know that as long as $q_t > \bar{q}(\phi_t^1, \phi_t^2) = \phi_t^2/(\phi_t^1 + \phi_t^2)$, $g_t^{1,op}(\lambda_t) > g_t^1(\lambda_t)$ and $g_t^{2,op}(\lambda_t) < g_t^2(\lambda_t)$.

Given the dynamics of institutions provided in (20), it is direct that when $q_t > \bar{q}(\phi_t^1, \phi_t^2)$, then $\lambda_{t+1} > \lambda_t$ when $c(\lambda_t, q_t) > 0$, so λ_t converges towards $\lambda^* = 1$. From the same reasoning, when $q_t < \bar{q}(\phi_t^1, \phi_t^2)$, then λ_t converges towards $\lambda^* = 0$.

A.4 Proof of Proposition 3

The socially committed equilibrium policy verifies the following first-order equation:

$$\lambda_t v'(g_t^1) - (1 - \lambda_t) \frac{1 - \tau q_t \phi_t^1}{1 - \tau(1 - q_t)\phi_t^2} v'(g_t^2) + G(q_t) = 0, \quad (\text{A.2})$$

with

$$G_\delta(q_t) = [\beta\tau + (1 - \beta)(1 - \tau)] \frac{q_t\phi_t^1 - (1 - q_t)\phi_t^2}{1 - \tau(1 - q_t)\phi_t^2} + Z(\lambda_t), \quad (\text{A.3})$$

with

$$Z(\lambda_t) = [\delta^1 \lambda_t \frac{\partial v(g_{t+1}^1)}{\partial q_{t+1}} + \delta^2 (1 - \lambda_t) \frac{\partial v(g_{t+1}^2)}{\partial q_{t+1}}] \frac{\partial q_{t+1}}{\partial g_t^1}. \quad (\text{A.4})$$

Deriving $Z(\lambda_t)$ with respect to λ_t gives:

$$Z'(\lambda_t) = [\delta^1 \frac{\partial v(g_{t+1}^1)}{\partial q_{t+1}} - \delta^2 \frac{\partial v(g_{t+1}^2)}{\partial q_{t+1}}] \frac{\partial q_{t+1}}{\partial g_t^1} > 0. \quad (\text{A.5})$$

Furthermore, as $Z(1) > 0$ and $Z(0) < 0$, we deduce that there exists a unique $\tilde{\lambda} \in (0, 1)$ such that when

$\lambda_t > \tilde{\lambda}$, $Z(\lambda_t) > 0$, and $Z(\lambda_t) \leq 0$ otherwise.

When $Z(\lambda_t) > 0$, $G_\delta(q_t) > G_0(q_t)$, meaning that the marginal utility at providing good 1 in period 1 is higher than in the case where the agents are not forward-looking.

Alternatively, when $Z(\lambda_t) < 0$, $G_\delta(q_t) < G_0(q_t)$, so the marginal utility at providing good 1 in period 1 is higher than in the case where the agents are not forward-looking

A.5 Proof of Proposition 4

In the general case, we can write (21) as:

$$\begin{aligned} \frac{\partial G(q_t)}{\partial \phi_{t+1}^2} = & \delta^1(1-\beta)\lambda_t \left[\frac{\partial q_{t+1}}{\partial g_t^1} \frac{\partial g_{t+1}^1}{\phi_{t+1}^2} v''(g_{t+1}^1) + \frac{\partial^2 g_{t+1}^1}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^1) \right] \\ & + \delta^2(1-\beta)(1-\lambda_t) \left[\frac{\partial q_{t+1}}{\partial g_t^1} \frac{\partial g_{t+1}^2}{\phi_{t+1}^2} v''(g_{t+1}^2) + \frac{\partial^2 g_{t+1}^2}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^2) \right] + \\ & \beta\tau\delta \left[\phi_{t+1}^1 \frac{\partial g_{t+1}^1}{\partial \phi_{t+1}^2} - g_{t+1}^2 - \phi_{t+1}^2 \frac{\partial g_{t+1}^2}{\partial \phi_{t+1}^2} + q_{t+1} \phi_{t+1}^1 \frac{\partial^2 g_{t+1}^1}{\partial \phi_{t+1}^2 \partial q_{t+1}} + (1-q_{t+1}) \phi_{t+1}^2 \frac{\partial^2 g_{t+1}^2}{\partial \phi_{t+1}^2 \partial q_{t+1}} \right]. \quad (\text{A.6}) \end{aligned}$$

Observe from the first two terms in the last line of the equation above that - abstracting from the second order effects - the ruler has an incentive to go where the wind blows in terms of institutional change. Indeed, $\partial g_{t+1}^1 / \partial \phi_{t+1}^2 < 0$ and $\partial g_{t+1}^2 / \partial \phi_{t+1}^2 > 0$, so abstracting from the second order effect, the ruler has an incentive to decrease the provision of good 1 in period t when an a technology of type 2 is expected to diffuse in period $t+1$. Intuitively, this is because when choosing his indoctrination effort, the ruler compares whether an additional type 1 individual will generate more rents than an additional type 2 individual. Consequently, when there is an innovation on the type 2 technology, then the incentive of the ruler to increase the population of type 2 is higher. The second order effects (the two last terms in the last line of the equation above) makes the prediction ambiguous nevertheless in the general case. This is why we assume that β is low in the subsequent proof, as the incentive of the ruler is necessarily dominated relative to that of the elites in that case.

We will indeed show in this proof that under some conditions,

$$\begin{aligned} \frac{\partial H(q_t)}{\partial \phi_{t+1}^2} = & \delta^1(1-\beta)\lambda_t \left[\frac{\partial q_{t+1}}{\partial g_t^1} \frac{\partial g_{t+1}^1}{\phi_{t+1}^2} v''(g_{t+1}^1) + \frac{\partial^2 g_{t+1}^1}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^1) \right] \\ & + \delta^2(1-\beta)(1-\lambda_t) \left[\frac{\partial q_{t+1}}{\partial g_t^1} \frac{\partial g_{t+1}^2}{\phi_{t+1}^2} v''(g_{t+1}^2) + \frac{\partial^2 g_{t+1}^2}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^2) \right] > 0, \quad (\text{A.7}) \end{aligned}$$

which would then imply that $\partial G(q_t) / \partial \phi_{t+1}^2 > 0$ when β is sufficiently low.

Relative to the proof of proposition 4, observe first that conservative revivals are not necessarily ruled

out in societies where conservative elites are not powerful. The proof of this claim is provided in the text. The proof of the second point of the proposition is also provided in the text.

In the rest of this proof, we intend to show that when an innovation of type 2 is expected to diffuse, a society necessarily experiences a revival when (i) the conservative technology is weak, (ii) conservative elites are sufficiently strong, (iii) risk averse and (iv) β is sufficiently low. For that purpose, we will proceed in two steps. First, we will demonstrate that the marginal benefit of the conservative elites to provision good 1 in period t increases with ϕ_{t+1}^2 when the conservative elites are risk averse. Second, we will apply Proposition 3, which demonstrates that the incentives of the conservative elites dominate in social choice when λ_t is sufficiently high. Combining the two preceding points then, we will be able to deduce that when ϕ_{t+1}^2 increases - and given that the conservative elites are powerful, risk averse, and that β is sufficiently low - then institutions change so as to accommodate for a higher provision of the conservative good when a modernist innovation is made. Assume that $v(g^t) = 1/(1-\epsilon)(g^t)^{1-\epsilon}$, with $\epsilon \in (0, 1)$. The optimal provision scheme in period t is determined by the first-order equation (14), which rewrites

$$\lambda_t (g_t^1)^{-\epsilon} - (1 - \lambda_t) \frac{1 - \tau \phi_t^1 q_t}{1 - \phi_t^2 (1 - q_t)} (g_t^2)^{-\epsilon} = 0. \quad (\text{A.8})$$

We deduce that

$$\frac{g_t^1}{g_t^2} = \left(\frac{\lambda_t}{1 - \lambda_t} \right)^{1/\epsilon} \left(\frac{1 - \tau \phi_t^2 (1 - q_t)}{1 - \tau \phi_t^1 q_t} \right)^{1/\epsilon}, \quad (\text{A.9})$$

from which we obtain that

$$\begin{cases} g_1^t = \frac{\tau \alpha_0}{1 - \tau \phi_t^1 q_t} \frac{1}{1 + 1/Z} \\ g_2^t = \frac{\tau \alpha_0}{1 - \tau \phi_t^2 (1 - q_t)} \frac{1}{1 + Z}, \end{cases} \quad (\text{A.10})$$

with

$$Z = \left(\frac{\lambda_t}{1 - \lambda_t} \right)^{1/\epsilon} \left(\frac{1 - \tau \phi_t^2 (1 - q_t)}{1 - \tau \phi_t^1 q_t} \right)^{(1-\epsilon)/\epsilon}. \quad (\text{A.11})$$

We can show that

$$\frac{\partial g_t^1}{\partial q_t} = A + B, \quad (\text{A.12})$$

with

$$A = \frac{\tau^2 \alpha_0 \phi_t^1}{(1 - \tau \phi_t^1 q_t)^2} \frac{Z}{1 + Z}, \quad (\text{A.13})$$

and

$$B = \frac{\tau \alpha_0}{1 - \tau \phi_t^1 q_t} \frac{1}{(1 + Z)^2} \frac{\partial Z}{\partial q_t}, \quad (\text{A.14})$$

and

$$\frac{\partial Z}{\partial q_t} = \frac{1-\epsilon}{\epsilon} \left(\frac{\lambda_t}{1-\lambda_t} \right)^{1/\epsilon} \frac{\tau(\phi_t^1 + \phi_t^2 - \tau\phi_t^1\phi_t^2)}{(1-\tau\phi_t^1q_t)^2} \left(\frac{1-\tau\phi_t^2(1-q_t)}{1-\tau\phi_t^1q_t} \right)^{(1-2\epsilon)/\epsilon} \quad (\text{A.15})$$

From this point, we see that

$$\frac{\partial^2 Z}{\partial \phi_t^2 \partial q_t} > 0 \text{ when } \epsilon > 1/2, \quad (\text{A.16})$$

so

$$\frac{\partial B}{\partial \phi_t^2} > 0 \text{ when } \epsilon > 1/2, \quad (\text{A.17})$$

and

$$\frac{\partial A}{\partial \phi_t^2} < 0. \quad (\text{A.18})$$

However, since $\frac{\partial A}{\partial \phi_t^2}$ tends towards zero when ϕ_t^1 is low while $\frac{\partial B}{\partial \phi_t^2}$ stays strictly positive as long as $\epsilon > 1/2$, then we deduce that

$$\frac{\partial^2 g_t^1}{\partial q_t \partial \phi_t^2} > 0 \quad (\text{A.19})$$

when $\epsilon > 1/2$ and ϕ_t^1 is low enough. Therefore,

$$\frac{\partial^2 g_{t+1}^1}{\partial q_{t+1} \partial \phi_{t+1}^2} > 0 \quad (\text{A.20})$$

when $\epsilon > 1/2$ and ϕ_{t+1}^1 is low enough. Recall now that (23) writes:

$$\begin{aligned} \frac{\partial H(q_t)}{\partial \phi_{t+1}^2} &= \delta^1 \lambda_t \left[\frac{\partial q_{t+1}}{\partial g_t^1} \frac{\partial g_{t+1}^1}{\phi_{t+1}^2} v''(g_{t+1}^1) + \frac{\partial^2 g_{t+1}^1}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^1) \right] \\ &\quad + \delta^2 (1-\lambda_t) \left[\frac{\partial q_{t+1}}{\partial g_t^2} \frac{\partial g_{t+1}^2}{\phi_{t+1}^2} v''(g_{t+1}^2) + \frac{\partial^2 g_{t+1}^2}{\partial \phi_{t+1}^2 \partial q_{t+1}} v'(g_{t+1}^2) \right], \end{aligned} \quad (\text{A.21})$$

so we deduce that the first line of (42) is necessarily positive when $\epsilon > 1/2$ and ϕ_{t+1}^1 is low enough, since

$$\frac{\partial^2 g_{t+1}^1}{\partial q_{t+1} \partial \phi_{t+1}^2} > 0 \quad (\text{A.22})$$

in that case. The terms in the first line of (41) dominate those on the second line when λ_t high enough, which means that $\partial H(q_t)/\partial \phi_{t+1}^2 > 0$ when λ_t is sufficiently high, $\epsilon > 1/2$ and ϕ_{t+1}^1 is low enough.

B Historical Narrative

In this Appendix, we provide some more historical detail regarding the ‘‘conservative 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 “old 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. 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).¹³

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 conservative 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 in turn 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 features 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

¹³The 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]).

changing world. What went wrong, according to this idea, was the failure of society to live up to these traditionalist standard (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 their failure in the Sino-Japanese War (1894-95)—it was too late, and the Ottoman and Chinese Empires failed soon thereafter. Yet, conservative revivals are not necessarily permanent. As we illustrated in Section 3, 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 the 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).