Economic Foundations of the Territorial State System*

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Abstract

The contemporary world is organized into a system of territorial states in which rulers exercise authority inside clearly defined boundaries and recognize the authority of other rulers outside those boundaries. We develop a model to explain how the major economic and military developments in Europe starting in the 15th century contributed to the development of this system. Our model rationalizes the system as an economic cartel in which self-interested and forward-looking rulers maintain high tax revenues by reducing competition in the "market for governance."

Key Words: territorial state system, borders, cartels

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1 Introduction

Today's world is organized into a system of territorial states, with most states recognizing the authority of others outside their boundaries. Outside of Antarctica, nearly every square inch of land in the world belongs to a state, and the fraction of this land that was claimed by more than one state in 2000 was only 1.6% (based on Schultz, 2015).

Such mutual recognition of territorial boundaries is remarkable in human history. As recently as the Middle Ages in Europe, and the Qing era in East Asia, political boundaries were not the markers of absolute changes in political authority.[1] The most powerful polities, like the Qing and the Holy Roman Empire, claimed authority over the whole world, and smaller polities acknowledged the superiority of larger ones. In the last several centuries, however, the world has witnessed the gradual formation of a system where borders have come to possess significantly greater political meaning. In the words of Stephen Krasner, "the clearest storyline of the last thousand years is the extruding out of universal alternatives to the sovereign state" (Krasner, 1993, 261).

In this paper, we offer a new theory of the territorial state system based on its development in Modern Europe.[2] One key driver of this development was the economic expansion that began in the Late Middle Ages, and which accelerated during the Industrial Revolution as Europe transformed from a predominantly agrarian economy to one in which monetary exchange, long-distance trade, and eventually industrial production also played important roles. At the same time, military technology and the administrative capabilities of states continued to improve as rulers built standing armies and modern bureaucracies. These developments turned states into fierce competitors in what we refer to as the "market for governance," by which we mean the market for an evolving package of state-provided services that are necessary for supporting increasingly complex decentralized economies. Our central thesis is that the territorial state system emerged as a solution for managing competition in the governance market.

[1] Although there are some examples of territorial demarcations in Antiquity and the Dark Ages (e.g. the boundaries delineated by the Partition Treaties of the Carolingian Empire), scholars like Sahlins (1989) and Elden (2013) argue that these boundaries did not mark the sharp changes in political authority that modern borders do. Even linear defensive systems that are sometimes interpreted retrospectively as borders, such as the Great Wall of China and the Roman *limes*, did not mark the limits of rulers' political claims (Kratochwil, 1986).

[2] By the "territorial state system" we mean specifically a system of territorial states in which borders constitute stable demarcations of sharp changes in political authority mutually recognized by the rulers on both sides. Because we do not provide a theory for how this narrow definition of the state system gave rise eventually to modern concepts "sovereignty," we use this latter term sparingly in the paper.

The economic expansion that took place in Europe since the Late Middle Ages increased the value of market-supporting governance for citizens (and their ability to pay for it), while improvements in military technology and bureaucratic organization made it cheaper for rulers to exercise control over longer distances. Together, these developments expanded the territory that rulers could profitably govern. Rulers attempted to expand their influence in response to these shifts and became competitive providers of governance in the areas where their influence overlapped. This competition drove down the revenues that each could collect from the overlapping areas. To avoid these losses, rulers developed a self-enforcing cooperative norm under which they divided the market for governance geographically, enabling them to exercise monopoly power within well-defined territorial boundaries. This cooperation gave rise, eventually, to the modern state system, which developed further with increases in economic and political complexity, and spread across the world with European influence.[3]

We develop our theory through a formal model. The model shows that when the value of governance is low and the costs of governing rise steeply in geographic distance, the governance markets of rulers do not overlap, providing no impetus for cooperation. As the value of governance rises and the costs of governing decline, however, these governance markets begin to overlap, driving down the revenues that rulers can collect in the overlapping areas as a result of competition. This provides the rulers with an impetus to recover the losses through cooperation, by agreeing to be monopoly providers of governance inside a well-defined territorial boundary. The model shows how cooperation can be made self-enforcing with the help of strategies that punish deviating rulers for violations of the cooperative norm. The model, therefore, explains the transition from a system without cooperation to one with cooperation, in which the key changing variables are the rising value of governance and the declining costs of governing distant territories.

Our model rationalizes the territorial state system as a cooperative equilibrium of a repeated game in which self-interested and forward-looking rulers form a cartel to raise revenue by limiting competition in the market for governance. It therefore builds on Levi's (1989) argument that rulers are revenue-maximizing. It also builds on the work of Konrad and Skaperdas (2012) and an earlier literature in comparative politics in which rulers raise revenue by selling protection and other forms of governance to their subjects. Finally,

[3]The scope of our theory is therefore limited to the European experience from the Early Modern period to the Industrial period. We can only speculate that this system was spread to the rest of the world with the enormous influence that European ideas had on international institutions in the last half millennium. See Section 5 for further discussion of what our theory leaves unexplained.

our model also relates to Keohane's (2005) neoliberal theory of inter-state cooperation in which cooperation is sustained in anarchy by the threat of future punishments for deviating from the cooperative norm (see also Axelrod, 2006).

Our argument is notably distinct from the influential view in international relations, which asserts that the development of the modern state system was the product of an ideational shift that took place with the Peace of Westphalia (1648). This view, though popular, has been challenged by several recent accounts. Osiander (1994) writes, for example, that the view "that the Peace of Westphalia was a milestone on the road to a states system built around the concept of sovereignty is a popular view, especially with students of international relations—but it is a myth" (78). While he and a few others (e.g. Krasner, 1993, Teschke, 2003, De Carvalho et al., 2011) have argued against the Westphalia hypothesis, none to our knowledge has fully articulated the precise mechanism behind an alternative account that emphasizes material incentives.

2 A Model of the Territorial State System

At the center of our theory is the concept of *governance*, which refers to the package of centrally provided state services that support a complex decentralized market economy. Charles Tilly (1985) and others in comparative politics have argued that the main service that rulers provided their subjects in the Late Middle Ages was protection, and Konrad and Skaperdas (2012) explain how the threat of expropriation by local bandits or distant robbers gave rise to economic insecurity, creating a *market* for protection. According to Konrad and Skaperdas (2012), early states emerged as participants in this market, providing protection in exchange for revenue.[4] This package of services is paid for by taxation, which may be in cash, in in-kind services (such as military service) or in valuable policy concessions (such as ceasing socially destructive activities).

[4]The work of Konrad and Skaperdas (2012) differs from that of Lane (1979) and Tilly (1985), who argued that early states were protection *rackets* that extort money without providing a service. While the Lane-Tilly view may be appropriate for very early states, the view that states only provide protection only from themselves (as opposed to also supporting law and order in society, enforcing contracts and providing market supporting public goods and services) is not warranted by the evidence and existing theory (see, e.g., Acemoglu, 2005). Moreover, the Konrad-Skaperdas view is consistent with Levi's (1989) argument that revenue-maximizing rulers enjoy what she calls "quasi-voluntary compliance" from their citizens. Citizens are voluntarily willing to pay rulers not just because payment takes place in the shadow of coercion, but also because they expect valuable services from the state. For this reason, we follow Konrad and Skaperdas (2012) and view states as competitors in the governance market.

Our concept of governance builds on this literature, recognizing that over time, states provided a wider array of services than simply protection. With the rise of long distance trade in Late Medieval and Early Modern Europe, the demand for governed economic exchange grew, and later rulers started to provide greater market-supporting services such as dispute resolution and economic regulation—services that had previously been provided privately by local institutions (Milgrom et al., 1990, Greif, 1993). Responding to the needs of an industrial economy, today's states provide an even wider array of public services; they also provide public goods, including public infrastructure, education and research. It is this evolving package of state-provided services that we refer to as "governance," and like Konrad and Skaperdas (2012), we view states as the sellers of governance in a market where there is a demand for such a package of services.

Building on this concept of governance, we develop a model in which the state system represents an economic cartel created by rulers to keep their revenues high by limiting competition in the governance market.

2.1 The Market for Governance

Two rulers called A and B are located at the endpoints, 0 and 1, of the unit interval. A continuum of individuals of unit mass are distributed uniformly between them. We identify each individual with his location on the interval, $\ell \in [0, 1]$. These individuals may be thought of as citizens or as chieftains, bishops, local lords and the types of small-scale authorities who exercise power within a given area.[5]

Each ruler i offers to sell governance to each individual by setting a location-specific price $p_i(\ell)$. The cost to ruler i from providing governance to an individual at ℓ is $c_i(\ell)$. We assume that $c_A(\ell)$ is a strictly increasing function while $c_B(\ell)$ is a strictly decreasing function, each with at most a finite number of jumps (see Figure 1). The value of governance to each individual is fixed at $v > 0$. Rulers simultaneously offer prices, and after looking at the prices offered, each individual decides whether or not to pay for the service, and if so, from which ruler. We refer to the set of individuals that purchase from a ruler as that ruler's *subjects*. Since no individual accepts a price larger than v, we interpret all offers

[5]The assumption that the locations of rulers is fixed is not meant to imply that rulers themselves were immobile. It captures the idea that all rulers have a point which can be thought of as the core of their existing polity, where they can govern cheaply, and that their cost of governing increases in distance from this area. The idea that citizens are also stationary is, as well, a simplifying feature. Our model's conclusions would be largely robust to building in the idea that citizens may be able to escape taxation by moving to "ungoverned territories" (e.g., Scott, 2014) if changing one's location is costly.

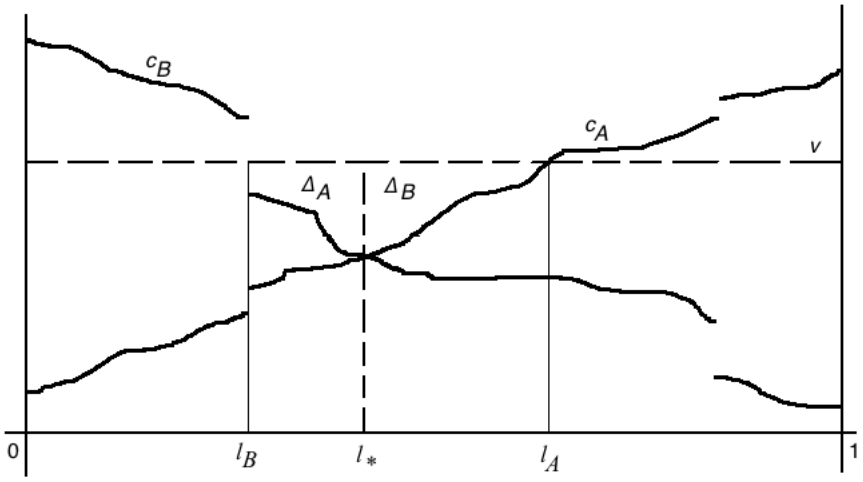

Figure 1. The case of overlapping markets.

$p_i(\ell) > v$ as indicating that ruler i chooses to *stay out* of the market for ℓ. Throughout the paper, we study sequentially rational pricing strategies for the two profit-maximizing rulers, and buying decisions for the individuals.

We interpret the environment geographically, and depict it in Figure 1.[6] We comment on non-geographic interpretations of the model below. The figure shows how the costs of providing the good may be discontinuous, reflecting the idea that geographic breaks such as mountains or rivers may cause abrupt changes in a ruler's cost of providing governance. We also maintain the following three assumptions:

(i) $c_A(0) < v$,
(ii) $c_B(1) < v$, and
(iii) $c_B(0) > c_A(0)$ and $c_A(1) > c_B(1)$.

The first assumption implies that the set of individuals for whom ruler A's cost of providing governance does not exceed their willingness to pay, v, is $[0, \ell_A]$ where $\ell_A := \sup\{\ell \leq 1 : c_A(\ell) < v\}$. We refer to the interval $[0, \ell_A]$ as ruler A's *market*. Similarly, the second assumption implies that the analogous market for ruler B is $[\ell_B, 1]$ where $\ell_B := \inf\{\ell \geq 0 : c_B(\ell) < v\}$. The third assumption implies that there is a unique threshold $\ell_* \in (0, 1)$

[6]We follow Kadercan (2015, 130) in distinguishing between geographic "space" (the raw material of territoriality), "demarcation" (the process of dividing space), and "constitution" (the process of giving these divisions meaning). While we take space as exogenous, both demarcation and constitution are determined endogenously in the model. Like Kadercan, and the large political geography literature he cites (e.g. Agnew, 2009, Larkins, 2009, Elden, 2013), in our model demarcation and constitution are jointly determined, and this process affects how territory is conceived.

such that $c_B(\ell) > c_A(\ell)$ for all $\ell < \ell_*$ and $c_B(\ell) < c_A(\ell)$ for all $\ell > \ell_*$. This means that A is the lower cost seller to the west of ℓ_* and B the lower cost seller to the east of ℓ_*. These thresholds are all depicted in Figure 1.

Non-spatial Interpretations Because it takes spatial delineation as given, our model cannot explain why boundaries were set in geographic space rather than other spaces.[7]

In fact, the model can accommodate non-spatial interpretations as well. For example, distance in the model could be interpreted as social distance based on individual traits. Rulers may consider having sovereignty over people rather than territory, as in Africa, where labor was scarcer than land in comparison to Europe (Herbst, 2014).

However, at least in Europe, a spatial delineation system was the natural outcome, especially as improvements in transportation technology enabled individuals to move across space more easily, and in a way that was difficult to regulate. It would simply be too costly to exert control, provide governance and raise revenue from subjects that inhabited distant lands. Rulers would have an interest in regulating human mobility, as they do today, through border control and visa requirements.

That said, from the perspective of governance and revenue collection, the modern state system represents a hybrid of delineation over spatial and non-spatial boundaries. For example, tax-treaties exist between modern states, suggesting that the division of control in the governance market can delineate control both over territory and over people.

2.2 Overlapping and Non-overlapping Markets

We say the rulers' markets *overlap* when $\ell_B < \ell_A$ so that $[0, \ell_A] \cap [\ell_B, 1] \neq \emptyset$. When this is the case, there is an interval $[\ell_B, \ell_A]$, depicted in Figure 1, where rulers A and B compete to provide governance to individuals that live in the interval. We refer to the interval $[\ell_B, \ell_A]$ as the *overlapping area*. Outside this area, only one ruler can profitably sell governance, making that ruler a monopoly provider. When markets overlap, assumptions (i) and (ii) and the monotonicity assumptions on c_A and c_B imply that $\ell_B \leq \ell_* \leq \ell_A$.

Our first result characterizes the subgame perfect equilibrium (SPE) of the static model in the case of non-overlapping and overlapping markets. It compares equilibrium

[7]Therefore, we leave unanswered the question raised by Ruggie (1993) on why spatial delineation emerged as opposed to other "heteronomous" forms of organization.

profits to the joint-profit maximizing levels of profit, which are

$$\Pi_A^* = v \min\{\ell_A, \ell_*\} \qquad \text{and} \qquad \Pi_B^* = v \max\{\ell_B, \ell_*\}$$

for rulers A and B, respectively. In the case of overlapping markets, we impose the requirement that *no ruler prices below cost*;[8] that is,

$$p_i(\ell) \geq c_i(\ell) \qquad \forall \ell \in [0,1] \text{ and } i = A, B.$$

Proposition 1. *If markets do not overlap, then in equilibrium ruler A sells to individuals in his market* $[0, \ell_A]$ *at price* $p_A(\ell) = v$*, ruler B sells to individuals in her market,* $[\ell_B, 1]$ *at the monopoly price* $p_B(\ell) = v$*, and individuals in* (ℓ_A, ℓ_B) *buy from neither A nor B. Consequently, the rulers maximize joint profit given demand.*

If markets overlap, then in any equilibrium in which no ruler prices below cost, ruler A offers prices $p_A(\ell) = \min\{v, \max\{c_A(\ell), c_B(\ell)\}\}$ *to individuals in* $[0, \ell_A]$ *and sells to individuals in* $[0, \ell_*]$*, while ruler B offers prices* $p_B(\ell) = \min\{v, \max\{c_A(\ell), c_B(\ell)\}\}$ *to individuals in* $[\ell_B, 1]$ *and sells to individuals in* $[\ell_*, 1]$*. Consequently, the profits of rulers A and B fall short of the joint profit maximizing levels of profits by, respectively,*

$$\Delta_A := \int_{\ell_B}^{\ell_*} v - c_B(\ell) d\ell \qquad \textit{and} \qquad \Delta_B := \int_{\ell_*}^{\ell_A} v - c_A(\ell) d\ell. \tag{1}$$

The proof of (a more formal version of) this proposition is presented in the appendix, along with all other proofs.[9]

When markets do not overlap, i.e. when $\ell_A < \ell_B$, the rulers are monopoly sellers in their respective markets, and maximize joint profit. In this case, each ruler's cost of providing governance in the other ruler's market is higher than any individual's willingness to pay for it, so each ruler stays out of the other's market. No ruler can sell profitably to individuals in the interval (ℓ_A, ℓ_B), so we refer to the interval as *ungoverned space*.

When markets overlap, each ruler can sell at the monopoly price only on the part of his or her market where the other ruler's cost exceeds each individual's willingness to pay. In the overlapping area $[\ell_B, \ell_A]$ the rulers become Bertrand competitors, driving down each of their prices: ruler A sells at a price equal to ruler B's cost to the west of

[8] A strategy of pricing below cost on any set of positive measure is weakly dominated by a strategy in which the ruler stays out of the market on that set, but prices the same way outside the set.

[9] More formally, the results of Proposition 1 hold except on sets of measure zero. We will ignore these technical issues and state that a result holds on a set if it holds almost everywhere on the set.

the boundary ℓ_*, while B sells east of ℓ_* at a price equal to A's cost. Consequently, the equilibrium outcome does not maximize the sum of the rulers' profits given demand, and as the proposition reports, the profits of rulers A and B fall short of their joint profit maximizing levels by Δ_A and Δ_B respectively. These are also depicted in Figure 1.

In the discussion of our cases, we will interpret the shortfall in revenue from monopoly profits in our model as being the privileges that peripheral elites and other individuals can win from central governments by playing them off against their neighbors. Elites in an overlapping area will always have fewer taxes and more privileges than those in the core, since they have the option to be governed (e.g. buy protection) from the rival ruler, who is willing and able to provide them with governance.

2.3 The State System as a Cartel Equilibrium

When the rulers' markets overlap, competition in the overlapping area drives down profits in the static game. In a repeated game, however, the rulers can improve their profits by setting up a cooperative agreement in which they divide territory at the partition point ℓ_*. In one such agreement, the rulers divide the overlapping market $[\ell_B, \ell_A]$ at the joint-profit maximizing boundary ℓ_* and stay out of the market for the other's subjects. Territorial sovereignty emerges as a cartel agreement between rulers.

Suppose that the rulers' markets overlap, the static game studied in the previous section is repeated indefinitely, and rulers discount future payoffs with a common discount factor $\delta < 1$. Several possible outcomes may be supported in an SPE. We consider two kinds of paths to be focal. The first is one in which a static game equilibrium of the kind characterized in Proposition 1 is played in every period of the supergame. We refer to this as a *static game equilibrium path*. The second is one that maximizes the joint profits of the two rulers, which is the infinite repetition of the outcome that maximizes joint profits period-by-period. In such a path, ruler A sells at the monopoly price v to individuals in $[0, \ell_*)$ and B sells at the monopoly price v to individuals in $(\ell_*, 1]$. The rulers thus earn profits Π_A^* and Π_B^* each period. We call this the *joint profit maximizing path*.

The proposition below characterizes a necessary and sufficient condition for the joint profit maximizing path to be supported by an equilibrium strategy profile of the repeated game in which the outcome path is played until and unless a deviation by either ruler has taken place, after which a static game equilibrium path is played forever after.[10]

[10]This is a "trigger strategy" profile. In such strategy profiles, we assume that individuals optimize statically (i.e., myopically) and that deviations by them are ignored by all players.

Proposition 2. *Suppose that markets overlap. The joint profit maximizing path is supported in equilibrium via the threat of reversion to any static game equilibrium path iff*

$$\delta \geq \max\left\{\frac{\Delta_A}{\Delta_A + \Delta_B}, \frac{\Delta_B}{\Delta_A + \Delta_B}\right\} \tag{2}$$

Proposition 2 shows how the territorial state system can be rationalized as cooperation in a repeated game, and therefore provides a "neoliberal" rationale for this system. The proposition also suggests that for cooperation to emerge, the gains from cooperation must be relatively even. Inequality (2) is more easily satisfied when the right hand side is low. The lowest value that this side can take is 1/2, which occurs when $\Delta_A = \Delta_B$. This means that regardless of the *magnitudes* of the gains that the rulers can achieve from recognizing the the limits of their authority, this recognition is most likely to emerge when the gains from cooperation are almost even.

Although our main contribution is to develop a new model of the territorial state system, the fact that Proposition 2 pins down the territorial boundary as being ℓ_* relates (and contrasts) our work existing models of inter-state borders. Alesina and Spolaore (1997), for example, study a model of state-formation in which borders emerge endogenously as the outcome of majoritarian voting—an assumption that runs counter to historical development of states, which preceded democracy. More closely, Friedman (1977) develops a theory of borders based on rulers maximizing tax revenue net of collection costs. As in our model, territory is allocated to maximize joint profit; but, unlike our model, this outcome is not based on cooperation between rulers in a cartel.

Finally, because the cost functions may be discontinuous at geographic breaks such as rivers and mountains, the territorial boundary ℓ_* is likely to occur at such a point of discontinuity. The model, therefore, provides a rationale for why many of the world's border demarcations correspond to such geographic barriers.

2.4 Explaining the Emergence of the State System

Our explanation for the emergence of the state system relies on the two comparative statics results stated below. These follow directly from the environment. As usual, we say that for two functions, f and g, $f \geq g$ when $f(x) \geq g(x)$ for all x.

Proposition 3. *ℓ_A is weakly increasing in v and weakly decreasing in c_A, while ℓ_B is weakly decreasing in v and weakly decreasing in c_B.*

The main implications of these comparative statics is that the rulers' markets are likely to overlap—and hence the impetus to develop a state system can only be present—when the value of governance, v, is large and when the costs of providing governance, c_A and c_B, are small. In light of this, we build on well-known stylized facts in the literature on economic growth and armed conflict to argue that both "demand-side" and "supply-side" changes that took place in post-Medieval Europe resulted in shifts from the situation of non-overlapping markets to that of overlapping markets. On the demand side, increases in economic productivity led to increases in the value of governance, v. On the supply side, improvements in military and administrative technology that improved states' capacity to recruit, control and supply effective armies lowered the costs, c_A and c_B, of governing distant areas. These changes resulted in increasingly overlapping markets, and made rulers competitive providers of governance in these markets, also providing them with the impetus to coordinate on the cartel equilibrium above.

Our model, therefore, provides a new explanation of the territorial state system that is grounded in the political economy of European growth in the post-Medieval period.[11] We are not aware of any prior work that has detailed the precise mechanism for how these economic forces shaped international organization, though some have alluded to the centrality of economic forces. Krasner (1993) simply asserts that the state system "can be explained primarily by material, not ideational, factors," (235) and that "the development of long distance trade ... advantaged larger units" (261). Osiander too is vague, writing that "the most significant transition occurred with the French Revolution and *the onset of industrialization*, not with the Peace of Westphalia..." (281) (emphasis added). Spruyt (1996) discusses economic development in the Middle Ages as a disrupter of feudalism, but states that the emergence of the sovereign state from this disruption was not necessarily inevitable. The literature nevertheless supports the idea that economic developments and material interests shaped the modern state system.

Similarly, on the supply side, we are not the first to link military and administrative innovations (such as the invention of artillery and the creation of more effective means of disciplining and supplying troops at long distances) to the political changes of the Early Modern period. Several authors, of whom Tilly (1992) is perhaps the best known, have traced the institutional development of European states to the military and administrative

[11] Economic historians often focus their attention on the acceleration in growth that Europe experienced during the period of industrialization, but Early Modern Europe also experienced a major expansion in economic activity that some describe as the "Commercial Revolution." See Maddison (2007) for quantitative estimates of economic growth in this period.

demands of war.[12] We differ from this work, however, in linking military and administrative innovations to the state *system*—that is, where states *stop* governing, rather than how their internal organization evolved over time with these changes.

2.5 Extensions

In the appendix we develop several extensions to show how the model can shed light on other aspects of international organization.

Dynamic Extension. Motivated by the comparative statics reported in Propostion 3, we develop a dynamic extension in which cooperation emerges in time as the rulers' losses from competition grow. Because our baseline model studies the static cases of cooperation and no-cooperation separately, one might argue that it only rationalizes the state system without capturing the change in rulers' incentives across the transition from non-cooperation to cooperation. By embedding the two cases of non-overlapping and overlapping markets into a unified model, the dynamic extension captures these changes.[13]

Interdependent Cooperation. We provide an extension that extends the bilateral setting above to a multilateral one with more than two rulers. This enables us to make the distinction between "independent cooperation" and "inter-dependent cooperation." Under independent cooperation, the relationship between two rulers is unaffected by each of their relationships with other rulers. Under inter-dependent cooperation, it is not. If one ruler fails to cooperate with another, then the first ruler's relationship with a third ruler may collapse as well. This extension helps account for the survival of small states in the international system. States recognize less powerful neighbors because they fear that annexing the small weak states may lead their other relationships to unravel.[14]

Entry Deterrence. In this extension, the stability of the state system may be challenged not just by rulers, but also by opportunist subjects seeking to establish themselves as new rulers by entering the governance market. As in other cartel models, existing providers have an incentive to deter entry because it threatens their profits. The large

[12] See also Brewer (1990), Besley and Persson (2010), and Gennaioli and Voth (2015).

[13] This extension shows that as the losses from not cooperating grow (as the value of governance v grows) then any asymmetries in the costs of governing in a neighborhood of l_* that make the losses relatively unequal for moderate values of v become less important. Then, there is a date in time after which (full-scale) cooperation between the rulers becomes self-enforcing.

[14] This extension produces results similar to classic balance of power theories in international relations, though with a somewhat different logic. Small states persist because the conflicts that would eliminate them would destabilize other relationships within the system.

fixed costs associated with starting a new state enable existing states to suppress entry by new potential rulers.

Border Persistence. In this extension, the joint profit maximizing boundary between two rulers may shift as governance costs change over time. When this happens, either the old (historical) boundary or the new joint-profit maximizing one may be focal. We show that it is ambiguous as to whether the conditions needed to make cooperation self-enforcing are stronger under the new joint-profit maximizing boundary or the old, since the shift in the costs can make the gains from cooperation more or less even.[15]

Conflict. Finally, while our model predicts stable borders and cooperation, history is replete with violent international conflict. Does this conflict not undermine the potential for long-term cooperation? When we embed a standard model of conflict into our framework, we find that in equilibrium, cooperation can be re-established after periods of conflict. Conflict serves as a mechanism by which a ruler credibly reveals any changes in his cost of providing governance when movements in this cost are private information.

3 An Illustrative Case

We now illustrate a key observable implications of our theory. The key implication is that the creation of a boundary as the result of cooperation between rulers should be followed by greater state control and expanded revenue collection in border areas.[16] We provide evidence for this in the case of England/Scotland, for which we have relatively high quality information on how cooperation took place. We discuss three other cases (Spain, France and Sweden) more briefly in the appendix.

Administratively, the border area between England and Scotland was a weak area for both states into the 17th century, with powerful local families (e.g., the Percys and Nevilles on the English side, the Douglasses and Homes on the Scottish) building up fiefs that enjoyed considerably more independence from royal interference than vassals

[15]Since it is common for historical boundaries to persist, the extension suggests that is possible that historical boundaries may be more focal than the changing joint profit maximizing ones. This view receives some support in recent work by Abramson and Carter (2016), who show that inter-state territorial disputes often have precedents in historical borders. If this is the case, then it could be that many of today's boundaries were once joint-profit maximizing but are no longer joint-profit maximizing today. Relatedly, the "artificial borders" that European powers used to divide territory in the colonies are perhaps not joint-profit maximizing today (and possibly never were for the non-European rulers of post-colonial states). But they may be focal in the same way historical boundaries in this extension can be focal, and sustained in equilibrium even when they are not joint-profit maximizing.

[16]By "greater state-control," we mean that rulers begin to restrict the authority, autonomy and privileges of lords and towns as described by Dincecco (2015).

elsewhere (see, e.g., Fraser, 2008). On the English side, this autonomy was sometimes formalized by the granting of "liberties," by which certain areas were exempted from ordinary royal jurisdiction, with courts being answerable to the local lord.[17] Some border families pressed their advantages even further, particularly those based in the "debatable lands," a belt of territory on the western border claimed by both England and Scotland. The Armstrongs, the leading family in the area, maintained an armed force of 3,000 men in 1528, and used them to raid cattle on both sides of the border, with the looted cattle being sold on the opposite side (Maxwell, 1896, 161).

During the course of the 16th century, however, the English and Scottish monarchies began to cooperate to assert their authority in the border region. The most prominent casualties of this process were the nobles that previously dominated the area. On the English side, the Percys and the Nevilles put aside their differences to lead a revolt against the court in 1569, but were defeated and their lands seized. On the Scottish side, the Armstrongs were severely weakened by executions and punitive land redistributions. Administrative powers gradually passed from these lords to bureaucratic entities such as the Council of the North (reestablished in 1537). The liberties were gradually abolished; for example, Hexhamshire (see footnote 17) was merged with the crown in 1545 and abolished in 1572. Eventually, the border areas were fully merged into the general administrative structures of the two kingdoms. The area was renamed the "Middle Shires," separate legal jurisdictions were abolished, hundreds of bandits were executed, and both governments issued a series of restrictions on armament and fortification (Fraser, 2008, 361-9).

In what follows, we provide detailed evidence for this process and a discussion of the rulers' motivations for carrying it out.

3.1 Evidence for Cooperation

The administrative integration of the border region was the results of a centuries long, gradually intensifying process of cooperation between England and Scotland. This cooperation involved three steps: (i) an agreement in principal to the existence of separate, territorially-defined sovereign states, (ii) an agreement on the exact course of the territorial division, and (iii) the development of joint institutions to adjudicate disputes and frustrate the ability of local lords to play one side off against the other. We provide a brief account of these three steps as follows.

[17] While these liberties were in principle subject to royal taxation, these taxes were often difficult to enforce. For example, in 1336, royal tax collectors told their rulers that they had been unable to enter Hexhamshire to collect, since "the King's write does not run there" (Holford and Stringer, 2010, 177).

Mutual Recognition. During the early Middle Ages, the English kings had claimed feudal superiority (as "Lord Paramount") over all of Scotland, and at various times attempted to annex and administer portions of southern Scotland and to serve as the arbitrator of legal disputes there (as in the "Great Cause" 1291, where Edward I choose from among several competing claimants to the Scottish throne). As a result, the demarcation between the two kingdoms (and recognition of Scotland's sovereignty) was either nonexistent or highly fluid. Many lords held land in both kingdoms, and even the Scottish King held some lordships on the "English side." (Holford and Stringer, 2010, 250).

The confusion over the status of the two polities was resolved gradually over the next few centuries by a series of cooperative treaties. The Treaty of Edinburgh-Northampton (1328), for example, elevated the status of the Scottish prince, Lord Robert, to that of sovereign ruler of Scotland, a land "separate in all things from the Kingdom of England, whole, free and undisturbed in perpetuity, without any kind of subjection, service claim or demand." This recognition forced lords to choose masters, leading to a precipitous decline in cross-border landholding (Holford and Stringer, 2010). Despite this, however, the next quarter century saw continued English efforts to annex Scotland (in whole or in part) with the help of disaffected Scottish lords. This conflict was ended by the Treaty of Berwick (1357) in which England returned to the Scots their captive king and recognized him once again as sovereign in return for a ransom demand and territorial concessions. No subsequent English ruler would question Scotland's status as an independent state, though they would periodically occupy portions of it or attempt to gain control of it through strategic marriages. In fact, even when they occupied Southern Scotland, the English never tried to annex it, and the areas they controlled "remained entirely separate from England, both legally and politically" (King and Etty, 2015, 161). Remarkably, the two kingdoms remained legally separate for a century after a single monarch took power in both (James I of England, VI of Scotland) in 1603.

Cooperative Demarcation. Even after the Scots won full recognition of their independence, the boundary was not precisely demarcated and, instead, the Treaty of Edinburgh-Northhampton enigmatically defined Scotland's boundaries as "its own proper marches as they were held and maintained in the time of King Alexander" (as quoted in Maxwell, 1912, 170). Particular bones of contention were the debatable lands, to which both sides held claim. The lawlessness of this region prompted one of Europe's first formal processes of border demarcation, a process especially remarkable because it took place between polities with a strong tradition of mutual hostility. In 1552, the two states appointed a five man commission to draw a border, with each party appointing two members

and the French ambassador serving as a neutral arbiter. A mutually agreeable line was surveyed through the area, giving the Scots more territory but the English control of the main road. The new border was marked by the "Scot's dike," an earthen mound with a ditch on either side (MacKenzie, 1951).

Cooperative Enforcement. Even in places where the borders were clear, their proximity created opportunities for astute locals to play one ruler off against the other. The leaders of local "surnames" (the landowning clans of the region) robbed and murdered on one side, returning to sell their loot on the other. To control such raids, the two kingdoms developed a remarkable system of international law enforcement, the "March Law," which attained full institutional development in the 1340s, though its roots were older (King and Etty, 2015, 162). The law was administered by royal officials, the "Wardens of the Marches," who worked closely with their opposite numbers on the other side of the border (Neville, 1988).

March Law was both customary and defined in "law books of the border," which were periodically compared to each other to ensure conformity (King and Etty, 2015, 166). A variety of crimes were covered, including murder, theft, kidnapping, seizure of castles and illegal cattle grazing. While victims were allowed the (carefully defined) right of hot pursuit, reprisals were strictly forbidden (King and Etty, 2015, 167). Instead, disputes were judged on specific "March Days" presided over by the two wardens, with juries chosen to be half Scottish and half English. Wardens were responsible for enforcing judgements against criminals on their side of the border, and might pay out of their own pocket if they were unable to raise the fine from the criminal through their own court system.

Inter-state legal cooperation extended much further once the two kingdoms came under the rule of King James (1603), though the proposals for such cooperation predate his accession. A joint border commission was established, even more independent of local elites than the warden's courts had been, but still representing both countries equally. The commission was responsible for the final "pacification" of the borders, disarming the surnames and executing hundreds of bandits (Ferguson, 1981).

3.2 Motivations for Cooperation

Why did the English and Scottish, bitter enemies in many other contexts, cooperate in their border policy? The surviving documents emphasize the desire to assert control over their territories by eliminating the border elites. This point was raised in the crucial Scottish Privy Council meeting (January 27th, 1551) which agreed to the partition of the

debatable lands with England. Instead of discussing the international situation and the gains to relations with England, the Council focused its attention on their exasperation with the area's residents, and the *internal* gains of partition. Burton et al. (1877, 118-9) quote the minutes of this meeting, which reflect exactly this exasperation:

> "The Queen's Grace, my lord Governor, and the lords of the secret council, having had consideration of the great and heavy crimes committed upon our sovereign lady's poor lieges by thieves and other malefactors, broken men, and the diverse murders and slaughters committed in the past, and especially by the inhabitants of the debatable land, who by night and day continually ride and make daily plunder and oppressions upon the poor ... and no victim can get remedied, nor any criminal can be put to due punishment..."

Similarly, the main reasons advanced for the division have less to do with the advantages for relations with England, or the international situation, but rather with the advantages that demarcation would bring to the internal political economy of Scotland:

> "[We] have thought it good, necessary and expedient that the debatable land be divided with such restrictions and conclusions as shall be concluded by the Queen's Grace, my lord Governor, and council, for the common good of the realm, the rest and quietness of the lieges thereof, and the keeping of the peace in all times to come."

Likewise, the correspondences of the English diplomats shows another interesting aspect of the partition exercise: the fact that both governments were well aware that demarcation was in the interests of the central government and not that of border elites, and that many of the powerful locals would not look kindly on any such division. O'Sullivan (2016) quotes one such letter:

> "Wherefore if a map were to be truly made by the consent of some men to be appointed on both parts, it is though that there might be a reasonable and equal division made by men which should have indifferent respect to the quiet and concord of both the realms, and not to be led with any private affection to the people dwelling on either parts of the said debatable [lands]. And, indeed the less privy the Borderers be made to the division hereof, the more likely it is that the thing will take place."

As the passage shows, the diplomats involved perceived themselves, in many respects, as having more in common with their fellow "indifferent" experts on the other side than with the border elites.[18]

Such documents, not intended for publication, provide the best available window into the motivations of Early Modern policy makers. They suggest that underneath the often tempestuous relationship between England and Scotland, ran an important thread of common interest: the desire to control their turbulent border subjects.

4 Alternative Theories

4.1 Ideational Theories

Perhaps the most influential ideational theory for the development of the modern state system is the *Westphalia hypothesis*: the idea that the Peace of Westphalia (1648) engendered the norm of territorial sovereignty, and therefore marked a critical juncture in the development of the modern state system. This particular ideational theory has been strongly critiqued in the literature by Osiander (2001), De Carvalho et al. (2011) and Krasner (1993), and many others.[19]

However, it remains possible that the territorial state system nevertheless developed as a result of an encounter with new ideas that resulted in a change in norms and ideology. This is a widely held view in international relations theory, supported by numerous authors. Ruggie (1993) writes, for example, that "the mental equipment that people drew upon in imagining and symbolizing forms of political community itself underwent fundamental change" and that "historians of political thought have long noted the impact on the emerging self-image held by European territorial rulers of a new model of social order" (157). Philpott (2001) echoes this view, claiming that "revolutions in sovereignty result from prior revolutions in ideas about justice and political authority" (4).

There are many theories of why and when these ideological changes occurred. Nexon (2009) discusses the role of the Reformation in changing the ideological basis of European politics in this period in a way that made the "composite" polities common in the early 16th century obsolete. Osiander (1994, 281) argues that the French Revolution represented the most important watershed, but only in the context of a gradual long-term

[18]Such links were further enhanced by the highly alcoholic banquets that took up much of the commission's time, the cost of which became the subject of a minor dispute between the two governments.

[19]We refer readers to these authors for a full discussion of the weaknesses of this hypothesis.

evolution of political ideas that led the development of "a shared, rather elaborate code of structural and procedural legitimacy" (279).

A closely related argument is that the ideas about territory and technologies for demarcating space changed in the Early Modern period, making "modern" territoriality ideologically possible. Political geographers have been especially active in examining the ways in which ideas about territory and territoriality evolved over time (Agnew, 2009, Larkins, 2009, Elden, 2013). They argue that territory, and particularly the bounded, less hierarchical idea of sovereignty, was an idea that had to be constructed. However, relative to Philpott (2001), the geography literature is less explicit in stating that these ideational changes *caused* the state system to develop, instead focusing on describing the ideological changes that occurred.

At the same time, other authors express skepticism about the primacy of ideas, suggesting that state-building altered political theory rather than the reverse. Krasner (1993) is among the skeptics, arguing that ideas were simply "legitimating rationales" that rulers could draw on to provide legitimacy to actions that they undertook primarily in their material self-interest. He writes:

> "Initially, the ideas [of sovereignty] were just hooks to justify actions that were motivated by considerations of wealth and power, not by visions of justice and truth. European leaders were fortunate in having many hooks because of the diversity and richness of European intellectual traditions." (257)

Even authors sympathetic to ideational arguments also agree that the self-interested motives also played a role, at least for some actors. Osiander (260), for instance, believes that private correspondence of Cardinal Richelieu and his allies in the Thirty Years War show a desire for self-aggrandizement much more than they do a commitment to any ideal of political order. More subtly, Nexon (2009) argues that the ideological changes of the Reformation were important precisely because of the way in which they interacted with existing patterns of non-religious political contestation.

Evaluating the causal impact of new ideas is difficult. Nevertheless, our model does not exclude the possibility that the ideas that succeeded and spread were both shaped by material interests, and in turn had an influence on the way rulers construed their interests. The interpretation of our model on this issue is that if new principles were the primary drivers of change, rulers should have an *incentive* to adhere to the principles; that is, those principles should be *self-enforcing*. Otherwise it becomes difficult to explain not just why

these principles spread but also why the stability of a system built upon these principles would not gradually be undermined by rulers realizing their interests in violating them.

4.2 Evolutionary Theories of the Size of States

The period of state-building was a period of rapid change in the capabilities of states to make war, administer justice, and collect revenue (Gennaioli and Voth, 2015). Spruyt (1996) argues that differences in capabilities across institutional forms were crucial for "the victory of the sovereign state" (154). The main portion of Spruyt's argument shows that variations in trade created alternative political forms in some parts of Europe during the Middle Ages. However, in Chapter 8, he addresses our question: why these alternative political structures were eliminated during the early modern period.

Unlike our theory, Spruyt's (1996) focuses on competition and selection among states rather than cooperation. For him, the sovereign, territorial state had "institutionally superior arrangements" (32) relative to city leagues and large empires, particularly in their ability to wage war.[20] Moreover, the organization of territorial states was incompatible with other forms of political organization and authority, whose claims they did not respect. Spruyt (1996) holds that changes in the internal structure of states changed the state system as "sovereign states selected out and delegitimized actors who did not fit a system of territorially demarcated and internally hierarchical authorities." (28). Combined with the superior resources of the sovereign state, over time this delegitimization would lead to non-territorial polities being selected out through "mimicry and exit" (171).

One shortcoming of this argument is that improvements in the economics of coercion or taxation, even uneven ones, are not guaranteed to lead to a territorial state system. In fact, improvements in military and administrative capacity are compatible with both claims of universal empire and the practice of mixed sovereignty. This claim receives support from the fact that outside of Europe, the introduction of Early Modern military innovations such as gunpowder was not accompanied by the development of a sovereignty norm. In fact, the so-called "gunpowder empires" of the Ottomans, Safavids, Mughals, and Qing used the new technology to repress local rulers and build large polities that explicitly claimed universal dominion (McNeill, 1989). Some of these states, particularly the Qing,

[20]This was in part a product of larger size of states, but even more closely related to their superior ability to prevent free riding and create homogenous internal markets (Spruyt, 1996, 158-67).

also made moves toward homogenous internal markets and administrative rationalization similar to what Spruyt describes in Europe.[21]

Therefore, while Spruyt's selection argument provides an explanation for why some polities (like France and Spain) succeeded while others (like the Hanseatic League) failed, it does not explain why the successful, institutionally superior states subsequently recognized each other's claims rather than continuing the process of "selecting out" the weaker states. Many states eventually ceased to claim all the territory that they could potentially have administered, or to which they might have laid claims. In particular, even if we accept that territorial polities are ideologically incompatible with city leagues, Spruyt's theory leaves unexplained why territorial polities would be compatible with each other in the long run. This is precisely where our model complements his.

4.3 Nations and Nationalism

Another explanation for the development of the territorial state system is the development of national identities. According to this theory, as individuals formed strong ethnic, linguistic, and religious attachments to particular states, changes in the costs of governing these individuals dictated the location of borders and bolstered the development of the state system by making it costly to annex territories inhabited by populations who saw themselves as belonging to other states.

While nationalism did coevolve with norms of territorial sovereignty, territorial divisions are likely to have reified national identities rather than the other way around. In particular, while the state system is typically thought of as originating in the Early Modern period (if not before), the classic accounts of nationalism describe the rise of the *nation*-state as taking place largely in the 19th century with the growth of conscription and primary schooling (Weber, 1976, Anderson, 2006, e.g.).

Weber (1976) makes the sequencing explicit, explaining how the French annexation process that took place during the 16th century "had [already] produced a political entity called France..., an entity formed by conquest..." but that "the modern view of the nation as a body of people united according to their own will and having certain attributes in common (not least history) was at best dubiously applicable to the France of 1870" (485). Similarly, Tilly (1995) holds that for 19th century states, "central control emphatically included cultural control, the singling out or creation of a single linguistic, historical,

[21]Note that Spruyt does not present an argument for the ideological incompatibility with or institutional inferiority of empires relative to sovereign states, though he does discuss the particular problems of Medieval European examples.

artistic and practical tradition from all those present within the national territory" (197). For these reasons, we are skeptical that the rise of nationalism was a significant driver of the development of the territorial state system in the early days of its development.

In fact, it is possible to explain the emergence of nationalism in a way that reinforces our argument. States first agree on borders, and then work hard to ensure that citizens on their side of the boundary identify with their institutions and not those of their neighbors (Laitin et al., 1994). Over time, this increases the costs for the neighboring state of governing a disloyal population in the border region. The rise of national attachments could provide an explanation for why long-established borders remain stable over time, even as the military capacities of the two states shift.

5 Conclusion

The modern territorial state system is a remarkable institutional construction that did not always exist. While borders are certainly contested in some regions of the world today, they are stable and meaningful political demarcations in most of the modern world. The Canadian and American governments do not collect taxes (sales, income, or corporate) from the residents of cities and towns just across their common border. This is a fact that requires explanation.

We have offered a new explanation for this fact built upon the economics of competition between states. States in our model are natural competitors in the market for governance, and their competition drives down the revenues that each can collect from providing governance to their citizens. Like modern economic cartels, they divide the market to limit competition and keep revenues high. Occasional shocks may lead to conflict over parts of the governance market, but the system of geographically-defined states has, by and large, been stable.

In an alternative world where competition in the governance market is allowed, the residents of Neche, North Dakota, could presumably decide whether to pay taxes to the American government or to the Canadian government (or neither) for public goods and services. They may even decide which services to buy from which government, for example public education from the United States and healthcare from Canada (or invite bidding as to which state would provide these services at the lowest cost). The same could be true for the residents of Gretna, Manitoba, just two miles north of Neche. This, however,

is not the reality we live in, and our theory provides an explanation for why states have made sure that it isn't.

Our theory raises new questions about the development of the territorial state system. For example, it leaves open for further examination the exact mechanisms by which co-operation was achieved, the role of technological improvements such as the development of maps, and institutional developments such as the exchange of ambassadors. Further work is also needed on the exact ways in which changes in international norms impacted local-level state behavior, and how the territorial state system spread first to the edges of Europe and later to the rest of the world.

Finally, our assertion that the state system is supported by rulers' interests in keeping their revenues high (and consequently the welfare of their citizens low) raises the question of how long such a low citizen-welfare equilibrium could persist, especially after the institutional developments of the 19th and 20th centuries—in particular, the advent of democracy and the rise of globalization. Research on these questions will help us further understand the changes in how political authority was organized over the last millennium, and may even provide clues as to how it may evolve in the future.

The territorial state system, now established, appears stable. But it will have to adapt to the modern technological changes, globalization and new international institutions changing the way the world is governed.

Appendix

A Proofs

A.1 Proof of Proposition 1

Suppose markets do not overlap. Ruler A's cost of providing governance is higher than each individual's willingness to pay, v, on the interval $(\ell_A, 1]$. This means that in equilibrium every individual in the interval $(\ell_A, 1]$ must not be buying from A. Analogously, almost every individual in the interval $[0, \ell_B)$ must not be buying from ruler B. Since $\ell_B \geq \ell_A$, ruler A must be selling at the monopoly price v to almost every individual on the interval $[0, \ell_A]$. To see why, suppose that A sets a price lower than v on a positive measure subset of this interval. Then he could profitably deviate by slightly raising the price on this subset, since all individuals in the subset would still have to buy. On the other hand, A cannot be staying out the market for a positive measure set of individuals in this interval, since in this case he could profitably deviate by setting a price slightly lower than v, compelling all individuals in this subset to buy. Finally, it cannot be that a positive measure of individuals in $[0, \ell_A]$ reject to purchase from A at the price v, since the ruler could profitably deviate by slightly lowering his price to these individuals. Therefore, A must be selling at the monopoly price v to almost every individual on the interval $[0, \ell_A]$. Analogously, B must be selling at the monopoly price v to almost every individual in $[\ell_B, 1]$. Finally, almost every individual in (ℓ_A, ℓ_B) must choose not to buy from either ruler, since their willingness to pay, v, is lower than either of the two rulers' costs. Under these conclusions, the rulers maximize the sum of their profits, given demand.

Now suppose markets overlap. First note that there is no equilibrium in which a set of positive measure of individuals in $[0, \ell_*]$ do not buy from either ruler, since A could profitably deviate by charging a price slightly lower than v to every individual in this set and get them to buy.

Second, it is straightforward to verify that A must sell at the monopoly price $p_A(\ell) = v$ to almost every individual in $[0, \ell_B)$. To see why, note that B must stay out of the market for almost every individual in this set, since no ruler prices below cost and because $c_B(\ell) > v$ for all $\ell \in [0, \ell_B)$. From this it follows that A must be charging a price $p_A(\ell) \leq v$ to almost every $\ell \in [0, \ell_B)$. A cannot be charging a price $p_A(\ell) < v$ to a positive measure set of individuals in $[0, \ell_B)$ given that B stays out of the market for these individuals, since A could profitably deviate by charging slightly higher to every individual in this set.

This establishes that A sells at the monopoly price $p_A(\ell) = v$ to almost every individual in this set. (This argument is analogous to the one used in the case of non-overlapping markets, where A sells at the monopoly price to every individual in $[0, \ell_A)$ since A's cost is lower than v on this set but B's cost is higher than v.)

Finally, A and B both offer a price equal to B's cost to almost every individual in the set $[\ell_B, \ell_*]$, and almost every individual in this set buys from A. Suppose, for the sake of contradiction, there were an equilibrium in which B sold to a positive measure subset S of individuals in $[\ell_B, \ell_*]$. Then, for every individual $\ell \in S$,

$$c_B(\ell) \leq p_B(\ell) \leq p_A(\ell)$$

where the first inequality follows from the refinement that no ruler prices below cost, and the second from the fact that the individuals are strategic buyers. Now note that S cannot have a subset S' of positive measure in which either of the two inequalities above is strict. If the first is strict, then A can profitably deviate by slightly undercutting B's price for every individual in S' and capturing the entire market of individuals in this set. If the second is strict, then B can profitably deviate by slightly raising his price for every individual in S' and still retaining its market. Therefore, $c_B(\ell) = p_B(\ell) = p_A(\ell)$ for almost every individual $\ell \in S$. But under the hypothesis that every individual in S buys from B, ruler A can profitably deviate by slightly lowering his price for every individual in S and capturing the market for almost every individual in this set. This establishes the contradiction.

Therefore, in equilibrium almost every individual in $[\ell_B, \ell_*]$ buys from A. This means that $p_A(\ell) \leq p_B(\ell)$ for almost every $\ell \in [\ell_B, \ell_*]$. In addition, we cannot have $p_A(\ell) < c_B(\ell)$ for a positive measure set of individuals in $[\ell_B, \ell_*]$, because on such a set we would have $p_A(\ell) < c_B(\ell) \leq p_B(\ell)$ by the condition that no ruler prices below cost, implying that A could profitably deviate by raising his price slightly to each individual in this set. Nor can we have $p_A(\ell) > c_B(\ell)$ on a positive measure subset of $[\ell_B, \ell_*]$ since B could profitably deviate by slightly undercutting A's price to each individual in such a set. Therefore, we must have $p_A(\ell) = c_B(\ell)$ almost everywhere on the set $[\ell_B, \ell_*]$. Finally, we cannot have $c_B(\ell) < p_B(\ell)$ on a positive measure subset of $[\ell_B, \ell_*]$, otherwise A could profitably deviate by slightly raising his price for every individual in this set. Since no ruler prices below cost, $p_B(\ell) = c_B(\ell)$ almost everywhere on $[\ell_B, \ell_*]$ as well.

A similar argument establishes analogous results to the east of the threshold ℓ_*. In equilibrium, almost every individual in $(\ell_A, 1]$ buys from B at the monopoly price of v

while A stays out of the market for a full measure set of these individuals. Rulers A and B each offer a price equal to A's cost to almost every individual in $(\ell_*, \ell_A]$ and almost every individual in this interval buys from B. Together, these results pin down equilibrium profits, and the shortfalls in these profits from the joint profit maximizing levels. □

A.2 Proof of Proposition 2

Indefinite play of a static game equilibrium path is clearly an SPE. Along the joint profit maximizing outcome path, ruler A's flow profit is $\Pi_A^* = v\ell_*$. In an SPE that supports this payoff via the threat of reversion to a static game equilibrium path, ruler A has no profitable deviation after a history in which no deviation has yet occurred if and only if

$$\Pi_A^* \geq (1-\delta)\left(\Pi_A^* + \Delta_B\right) + \delta\widehat{\Pi}_A$$

where $\widehat{\Pi}_A = \Pi_A^* - \Delta_A$ is A's equilibrium profit. This follows because the supremum one-period payoff that ruler A can get from a one-stage deviation from the path of play is $\Pi_A^* + \Delta_B$. This payoff is nearly obtained by deviating to enter the market for individuals in $(\ell_*, \ell_A]$ at prices slightly below v. After such a deviation, A earns a flow payoff of $\widehat{\Pi}_A$ in each subsequent period. Substituting $\Pi_A^* = \widehat{\Pi}_A + \Delta_A$ into the centered inequality above and rearranging gives $\delta \geq \Delta_B/(\Delta_A + \Delta_B)$. An analogous argument establishes that B has no profitable deviation if and only if $\delta \geq \Delta_A/(\Delta_A + \Delta_B)$. Therefore, the trigger strategy profile is an equilibrium if and only if the inequality stated in the proposition holds. □

B Extensions

B.1 Dynamic Extension

In each period $t = 0, 1, 2, ..., \infty$, the players take actions as in the static game described in the main text with $v = v_t$, where $\{v_t\}_{t=0}^{\infty}$ is an increasing sequence. All other parameters besides v are constant over time. This means that ℓ_* is constant over time, while ℓ_A weakly increases and ℓ_B weakly decreases as v increases. We index these changing thresholds using the time subscript, denoting them by $\ell_{A,t}$ and $\ell_{B,t}$ respectively. Since $\{v_t\}$ is an increasing sequence, we assume that there is some period $\underline{t} > 0$ such that $\ell_{B,t} \geq \ell_{A,t}$ for all $t < \underline{t}$ and $\ell_{B,t} < \ell_{A,t}$ for all $t \geq \underline{t}$. That is, the rulers' markets do not overlap for all $t < \underline{t}$ but they do overlap for all $t \geq \underline{t}$. Again, the rulers discount future payoffs with the common discount factor δ.

In this dynamic game, it is an equilibrium for the players to play a static game equilibrium strategy profile, as characterized in Proposition 1, in each period independent of history. We again refer to the outcome this generates as a static game equilibrium path. Along such a path, there is no shortfall in equilibrium profits in periods $t < \underline{t}$, but in periods $t \geq \underline{t}$ there are shortfalls equal to

$$\Delta_{A,t} = \int_{\ell_{B,t}}^{\ell_*} v_t - c_B(\ell) d\ell \quad \text{and} \quad \Delta_{B,t} = \int_{\ell_*}^{\ell_{A,t}} v_t - c_A(\ell) d\ell$$

for rulers A and B respectively. We assume that $\{\Delta_{A,t}\}$ and $\{\Delta_{B,t}\}$ converge to Δ_A^* and Δ_B^* respectively. This is guaranteed if $\{v_t\}$ converges to some $v^* > \max\{c_A(1), c_B(0)\}$, since in this case, the convergence of the integrands is uniform.[22]

Along a path in which the rulers maximize joint profit given demand, ruler A sells at the monopoly price of v_t to almost every individual in $[0, \min\{\ell_*, \ell_{A,t}\}]$ and B sells at the same monopoly price to almost every individual in $[\max\{\ell_*, \ell_{B,t}\}, 1]$, in each period t. This generates the joint profit maximizing outcome. We say that an outcome path is *eventually joint profit maximizing* if there is some period $\bar{t}$ such that the players play the joint profit maximizing outcome from time $\bar{t}$ onwards. We say that an outcome path that is eventually joint profit maximizing is *maximal* among a set of eventually joint profit maximizing outcome paths if it has the lowest value of $\bar{t}$ among all such outcome paths.

Proposition B.1. *Consider the set of eventually joint profit maximizing outcome paths that can be supported in equilibrium via the threat of reversion to any static game equilibrium path. A maximal such outcome path exists if and only if*

$$\delta > \max\left\{ \frac{\Delta_A^*}{\Delta_A^* + \Delta_B^*}, \frac{\Delta_B^*}{\Delta_A^* + \Delta_B^*} \right\} \tag{3}$$

Proof: A maximal path in the set of joint profit maximizing outcome paths that are supported in equilibrium via the threat of reversion to any static game equilibrium path exists if and only if this set is nonempty. A set of necessary conditions for this set to be nonempty is that there exists some period $\bar{t}$ such that

$$\sum_{t'=t}^{\infty} \delta^{t'-t}(\Pi_{i,t} + \Delta_{i,t}) \geq (\Delta_{i,t} + \Delta_{-i,t}) + \sum_{t'=t}^{\infty} \delta^{t'-t}\Pi_{i,t}, \qquad \forall t \geq \bar{t},\ i = A, B \tag{4}$$

[22]The assumption that $\Delta_{A,t}$ and $\Delta_{B,t}$ converge is not necessary for our results, but if they diverge they must grow sufficiently slowly relative to δ for payoffs to be well-defined.

which says that each ruler's payoff from the join profit maximizing outcome path is at least as large as the supremum payoff to deviating once any period $t \geq \bar{t}$ and triggering play of the static game equilibrium path. Canceling terms that are common to both sides of each inequality and rearranging gives

$$\delta \geq 1 - \frac{(1-\delta)\sum_{t'=t}^{\infty} \delta^{t'-t}\Delta_{i,t}}{\Delta_{A,t} + \Delta_{B,t}}, \qquad \forall t \geq \bar{t},\ i = A, B \tag{5}$$

Since $\Delta_{A,t}$ and $\Delta_{B,t}$ converge from below to Δ_A^* and Δ_B^* respectively, $(1-\delta)\sum_{t'=t}^{\infty} \delta^{t'-t}\Delta_{i,t}$ converges from below to Δ_i^* for each $i = A, B$. Therefore, the set of necessary conditions characterized above imply that

$$\delta > \frac{\Delta_{-i}^*}{\Delta_A^* + \Delta_B^*}, \qquad i = A, B \tag{6}$$

By continuity, this pair of inequalities is also sufficient to establish the existence of a time $\bar{t}$ such that (4) holds, which means that neither ruler has a profitable one-stage deviation from playing the joint profit maximizing outcome path when deviations trigger the play of a static game equilibrium path. Therefore, an equilibrium that supports a joint profit maximizing outcome paths via the threat of reversion to a static game equilibrium path exists if and only if (6) holds. □

The proposition above characterizes the emergence of territorial cooperation in the following sense. Consider a maximal joint profit maximizing outcome path that is supported in equilibrium via the threat of reversion to any static game equilibrium path, and denote the value of $\bar{t}$ after which the rulers maximize joint profit in this outcome path by $\bar{t}_{\min}$. Up to period $\underline{t}$, markets do not overlap and the rulers maximize joint profit by playing the static game equilibrium outcome. Therefore, if $\bar{t}_{\min} \leq \underline{t}$ then $\bar{t}_{\min} = 0$. When this is the case, the rulers maximize joint profit given demand in every period, so the territorial state system emerges in period $\underline{t}$ right when cooperation begins. If, on the other hand, $\bar{t}_{\min} > \underline{t}$ then there is at least one period $t \in \{\underline{t}, ..., \bar{t}_{\min}\}$ after markets begin to overlap in which the rulers competitively drive down each others' revenues. The state system emerges in a persistent (i.e., consolidated) way, only after time $\bar{t}_{\min}$.

It is worth mentioning that the predictions of this extension are consistent with the finding reported in the main text that revenue collection in the border regions of France increased more rapidly than in non-border regions. In the model, revenues from the non-border areas (close to the points 0 and 1) are increasing steadily with increases in

v. Revenues in the border regions close to ℓ_* are also increasing steadily for the same reason. But in period $\bar{t}_{\min}$ there is a sharp increase in revenues collected by each ruler in border areas close to ℓ_* since revenues increase abruptly from their static game levels to the monopoly level, v, in this period. This suggests that the rate of growth in revenues from periods before $\bar{t}_{\min}$ to periods after should be higher in border areas.

Finally, our assumption that the only time-varying parameter is v not only simplifies the dynamic extension, but is also a first order approximation that is substantively grounded in the relatively more important role of the increase in the value of governance due to economic development rather than the changes in military technology and organization that took place in large effect in the Late Middle Ages. Nevertheless, since military technology and organization continued to improve over time, it is natural to think that the costs c_A and c_B were also declining. Our model can account for this, though in this case the joint profit maximizing boundary ℓ_* would also be changing over time. Since borders eventually became relatively stable, this raises the question of how to interpret boundary changes along the joint-profit maximizing path. In other words, how did territorial redistributions occur? We address this question in Sections B.4 and B.5 below.

B.2 Independent vs. Interdependent Cooperation

We augment the baseline model of the main text by adding a ruler called C located at -1 and a continuum of individuals spread uniformly between -1 and 0. Like individuals located to the east of 0, each individual located to the west of 0 values governance at v. Ruler A's cost of providing governance to each individual located at $\ell \in [-1, 1]$ is now a function $c_A(\ell)$ that is strictly decreasing on $[-1, 0]$ and strictly increasing on $[0, 1]$ and continuous at 0. Ruler B's cost of providing governance is a strictly decreasing function $c_B(\ell)$ and ruler C's cost of providing governance is a strictly increasing function $c_C(\ell)$. Again, all of these cost functions have at most a finite number of discontinuities. Our assumptions are now

(i) $\max\{c_A(0), c_B(1), c_C(-1)\} < v < \min\{c_B(0), c_C(0)\}$
(ii) $c_A(1) > c_B(1)$, and
(iii) $c_A(-1) > c_C(-1)$.

Note that we have more than simply generalized our previous assumptions, since we have added the assumption that B's cost of providing governance to the west of 0 and C's cost of providing governance to the east of 0 are greater than any individual's willingness

to pay.[23] Ruler A's market is now $[\ell_A^w, \ell_A^e]$ where $\ell_A^w := \inf\{\ell \geq -1 : c_A(\ell) < v\}$ and $\ell_A^e := \sup\{\ell \leq 1 : c_B(\ell) < v\}$. Ruler B's market is still $[\ell_B, 1]$ where $\ell_B := \inf\{\ell \geq 0 : c_B(\ell) < v\}$ and ruler C's market is $[-1, \ell_C]$ where $\ell_C := \sup\{\ell \leq 0 : c_C(\ell) < v\}$. The two other relevant thresholds are $\ell_*^e \in (0,1)$, where c_A crosses over c_B and $\ell_*^w \in (-1,0)$ where c_C crosses over c_A. We assume that markets overlap both at the east and west of 0, so

$$\ell_A^w < \ell_C \leq 0 \leq \ell_B < \ell_A^e \quad \text{and} \quad \ell_A^w \leq \ell_*^w \leq \ell_C \quad \text{and} \quad \ell_B \leq \ell_*^e \leq \ell_A^e.$$

This implies that in an equilibrium in which no ruler prices below cost, equilibrium profits fall short of their joint profit maximizing levels for A by $\Delta_A^e + \Delta_A^w$, where

$$\Delta_A^e := \int_{\ell_B}^{\ell_*^e} v - c_B(\ell) d\ell \quad \text{and} \quad \Delta_A^w := \int_{\ell_*^w}^{\ell_C} v - c_C(\ell) d\ell;$$

for B by

$$\Delta_B := \int_{\ell_*^e}^{\ell_A^e} v - c_A(\ell) d\ell;$$

and for C by

$$\Delta_C := \int_{\ell_A^w}^{\ell_*^w} v - c_A(\ell) d\ell.$$

However, when the game is infinitely repeated, and all three rulers discount future payoffs by δ, the rulers may be able to achieve higher profits. We consider two modes of cooperation to be focal. Under *independent cooperation*, rulers A and B maximize joint profit to the east of 0 and B stays out of the market for individuals to the west of 0, until and unless a deviation by either of them, after which they revert to their static game equilibrium pricing strategies to the east of 0 and keep their strategies to the west of 0. Rulers A and C behave analogously to the west of 0. Thus, ruler A's relationship with B is independent of his relationship with C and vice versa. Under *interdependent cooperation*, all rulers maximize joint profit unless and until *any* deviation by any of them takes place, after which all revert to the indefinite play of their static game equilibrium strategies. In both cases, the individuals (i.e. buyers) optimize statically, and all deviations by them are ignored. This completes the description of two different strategy profiles.

[23] This assumption is not necessary for our results but simplifies the analysis, enabling us to make our main points without additional analytical cost.

Proposition B.2. *Independent cooperation is an equilibrium if and only if*

$$\delta \geq \overline{\delta}_{\text{indep}} := \max\left\{\frac{\Delta_A^e}{\Delta_A^e + \Delta_B}, \frac{\Delta_B}{\Delta_A^e + \Delta_B}, \frac{\Delta_A^w}{\Delta_A^w + \Delta_C}, \frac{\Delta_C}{\Delta_A^w + \Delta_C}\right\} \tag{7}$$

Interdependent cooperation is an equilibrium if and only if

$$\delta \geq \overline{\delta}_{\text{inter}} := \max\left\{\frac{\Delta_A^e}{\Delta_A^e + \Delta_B}, \frac{\Delta_A^w}{\Delta_A^w + \Delta_C}, \frac{\Delta_B + \Delta_C}{\Delta_A^e + \Delta_A^w + \Delta_B + \Delta_C}\right\} \tag{8}$$

Proof: Under both independent and interdependent cooperation, rulers B and C do not have profitable one-stage deviations in all histories prior to the trigger of static game equilibrium play between each of them and ruler A if and only if both of the following inequalities hold:

$$\widehat{\Pi}_B + \Delta_B \geq (1-\delta)(\widehat{\Pi}_B + \Delta_B + \Delta_A^e) + \delta\widehat{\Pi}_A$$
$$\widehat{\Pi}_C + \Delta_C \geq (1-\delta)(\widehat{\Pi}_C + \Delta_C + \Delta_A^w) + \delta\widehat{\Pi}_C$$

where $\widehat{\Pi}_B$ and $\widehat{\Pi}_C$ are the static game equilibrium payoffs to B and C respectively in an equilibrium where no ruler prices below cost. These inequalities rearrange to $\delta \geq \Delta_A^e/(\Delta_A^e + \Delta_B)$ and $\delta \geq \Delta_A^w/(\Delta_A^w + \Delta_C)$.

For ruler A to not have a profitable one-stage deviation in histories prior to a deviation by any ruler, under independent cooperation, we need

$$\widehat{\Pi}_A + \Delta_A^e + \Delta_A^w \geq (1-\delta)(\widehat{\Pi}_A + \Delta_A^e + \Delta_A^w + \Delta_B) + \delta(\widehat{\Pi}_A + \Delta_A^w) \tag{9}$$
$$\widehat{\Pi}_A + \Delta_A^e + \Delta_A^w \geq (1-\delta)(\widehat{\Pi}_A + \Delta_A^e + \Delta_A^w + \Delta_C) + \delta(\widehat{\Pi}_A + \Delta_A^e) \tag{10}$$

where (9) says that A cannot profit by breaking his relationship with B alone (10) says that A cannot profit by breaking his relationship with C alone. We also need

$$\widehat{\Pi}_A + \Delta_A^e + \Delta_A^w \geq (1-\delta)(\widehat{\Pi}_A + \Delta_A^e + \Delta_A^w + \Delta_B + \Delta_C) + \delta\widehat{\Pi}_A \tag{11}$$

which says that A cannot profit by simultaneously breaking his relationship with both B and C. But this condition is implied by (9) and (10) since these simplify to $\Delta_A^e \geq (1-\delta)(\Delta_A^e + \Delta_B)$ and $\Delta_A^w \geq (1-\delta)(\Delta_A^w + \Delta_C)$ respectively; and if we add these two inequalities we get $\Delta_A^e + \Delta_A^w \geq (1-\delta)(\Delta_A^e + \Delta_A^w + \Delta_B + \Delta_C)$, which implies (11). Then, (9) and (10) rearrange to $\delta \geq \Delta_B/(\Delta_A^e + \Delta_B)$ and $\delta \geq \Delta_C/(\Delta_A^w + \Delta_C)$. After all other

histories, players are repeatedly playing static game equilibrium on the relevant side of 0, so there are no profitable one-stage deviations. Therefore, (7) and (8) are both necessary and sufficient for independent cooperation to be an equilibrium strategy profile.

Under interdependent cooperation, for ruler A to not have a profitable one stage-deviation in histories prior to any deviation by any ruler, we need only (11) to hold. This rearranges to

$$\delta \geq \frac{\Delta_B + \Delta_C}{\Delta_A^e + \Delta_A^w + \Delta_B + \Delta_C}.$$

After all other histories, the static game equilibrium is played forever, so (8) is necessary and sufficient for interdependent cooperation to be an equilibrium strategy profile. □

Since (9) and (10) imply (11) in the proof above, it must be that $\overline{\delta}_{\text{indep}} \geq \overline{\delta}_{\text{inter}}$. Moreover, the inequality may be strict, which happens when three conditions are met: (i) one of A's no profitable deviation conditions from the path of play under independent cooperation defines $\overline{\delta}_{\text{indep}}$, meaning that $\overline{\delta}_{\text{indep}}$ is the solution to either (9) or (10) when they hold with equality; (ii) both of B and C's no profitable deviation conditions from the path of play hold with strict inequality when $\delta = \overline{\delta}_{\text{indep}}$; and (iii) the pair of A's no profitable deviation conditions from the path of play under independent cooperation together imply that A's no profitable deviation condition from the path of play under interdependent cooperation holds with strict inequality, meaning that (9) and (10) imply (11) holds strictly. Condition (iii) holds generically since it does not hold only if $\Delta_B/\Delta_C = \Delta_A^e/\Delta_A^w$.

The basic point is that if A can profitably deviate under interdependent cooperation, then he can profitably deviate under independent cooperation. A may be tempted to break his cooperative relationship with B under independent cooperation, but under interdependent cooperation, breaking the relationship with B results in his relationship with C collapsing as well, which may be too costly. This suggests that it may be possible to support a territorial state system through multilateral, or interdependent, cooperation, even when cooperation cannot be supported independently in each bilateral relationship.

That said, in cases where neither independent nor interdependent cooperation are an equilibrium, it may still be possible to support bilateral cooperation between two rulers. For example, supporting cooperation between A and B requires only that δ be weakly larger than $\overline{\delta}_{AB} := \max\{\Delta_A^e/(\Delta_A^e + \Delta_B), \Delta^B/(\Delta_A^e + \Delta_B)\}$ and it may be the case that $\overline{\delta}_{AB} < \overline{\delta}_{\text{inter}}$ so that if $\delta \in (\overline{\delta}_{AB}, \overline{\delta}_{\text{inter}})$, then cooperation between A and B can be self-enforcing even though interdependent cooperation cannot.

Finally, even when both interdependent and independent cooperation are self-enforcing, interdependent may still be the more attractive way to support the overall stability of the territorial state system. It works whenever independent cooperation does: the incentive to not misbehave is at least as large under interdependent cooperation as it is under independent cooperation, and may be strictly larger. Moreover, interdependent cooperation is simple in the sense that it makes it unnecessary for rulers to calculate, for each of possibly many cooperative bilateral relationship they are in, whether it may be profitable to break the relationship. Since all cooperation collapses if any one relationship is broken, a ruler must simply appreciate that the sum total value of all of his cooperative relationships is greater than the maximum that he can obtain from misbehaving.

B.3 Entry Deterrence

Consider the environment described in Appendix B.2 but with the difference that there is no ruler located at 0, or equivalently that ruler A has stayed out of the market for all individuals to the east and west of 0 in all (unmodeled) periods prior to period 0. In this sense, A is simply an individual located at 0. B and C are active rulers. At the start of the game, B and C each simultaneously decide how much to pay to deter entry by A. Let d_B and d_C denote the amounts the contribute respectively. If $d_B + d_C \geq d$ where d is a parameter, then A cannot enter the market, but if $d_B + d_C < d$ then A enters the market for governance. If A enters, he becomes an active ruler, and his cost of providing governance is c_A, as in the previous environment. We maintain all of the assumptions of the previous section. The game then proceeds as in the previous section. In this case, if A were to enter the market and the rulers played an equilibrium that maximized joint profit in the subgame after A enters, the profits of rulers B and C would fall short of their profits in the joint profit maximizing outcome path for the subgame after A chooses to not enter by Δ_A^e and Δ_A^w, respectively.

Proposition B.3. *Consider the class of equilibria in which all active rulers maximize joint profit in all subgames after B and C make their contribution decisions, and suppose that this class is nonempty. (i) If $(1-\delta)d < \max\{\Delta_A^w, \Delta_A^e\}$ then in all equilibria in this class, A does not enter. (ii) If $\Delta_A^w + \Delta_A^e < (1-\delta)d$ then in all equilibria in this class, A enters. (iii) If $\max\{\Delta_A^w, \Delta_A^e\} < (1-\delta)d$ and $(1-\delta)d < \Delta_A^w + \Delta_A^e$ then there are equilibria in this class where A enters and where A does not enter.*

Proof: (i) In this case, there is an equilibrium in this class in which B contributes $d_B = d$, C contributes $d_C = 0$ and A does not enter. If there were an equilibrium in

which A entered, then $d_B + d_C < d$ but B could profitably deviate by raising d_B so that $d_B + d_C = d < \Delta^e/(1-\delta)$ in which case entry by A would be deterred. The analogous argument holds if $\Delta^w_A > (1-\delta)d$ but with the roles of B and C reversed.

(ii) In this case there is an equilibrium in this class where $d_B = d_C = 0$. If A did not enter, then either B would be making a contribution larger than $\Delta^e_A/(1-\delta)$ or C would be making a contribution larger than $\Delta^w/(1-\delta)$. One of them could thus profitably deviate by lowering their contribution to 0.

(iii) In this case, there are equilibria in this class where $d_B = d_C = 0$ and A enters. Neither B nor C can profitably deter A by unilaterally raising his contribution. There are also equilibria where $d_B < \Delta^e_A/(1-\delta)$ and $d_C < \Delta^w_A/(1-\delta)$ and $d_B + d_C = d$. □

Lastly, we note that the above analysis is conducted under the assumption inherited from the environment of Appendix B.2 that B's cost of providing governance to the west of 0 and C's cost of providing governance to the east of 0 are greater than an individual's willingness to pay, v. This means that the markets of B and C do not overlap. In the case where their markets do overlap, the situations where the rulers can deter entry by A would differ. However, the main feature of this extension—that entry deterrence by new rulers is, in some situations (e.g. case (iii) of the proposition above), a coordination problem between existing rulers would still carry over.

B.4 Border Persistence and Change

Suppose that the baseline model in the main text describes a stage game that is played repeatedly by rulers A and B who discount future payoffs at rate $\delta < 1$, but that prior to the start of play, the players learn whether ruler A's cost is $c_A = \overline{c}_A$ or $\underline{c}_A$, where $\overline{c}_A(\ell) \geq \underline{c}_A(\ell)$ for all ℓ. The joint profit maximizing boundary under $\overline{c}_A$ is $\ell_* = \overline{\ell}_*$, and under $\underline{c}_A(\ell)$ is $\ell_* = \underline{\ell}_*$. Note that $\underline{\ell}_* \geq \overline{\ell}_*$ and $\underline{\ell}_A \geq \overline{\ell}_A$. Ruler A's market is $[0, \ell_A] = [0, \overline{\ell}_A]$ under $\overline{c}_A$ and $[0, \ell_A] = [0, \underline{\ell}_A]$ under $\underline{c}_A$. Ruler B's market is $[\ell_B, 1]$ regardless of A's cost. The idea is that in unmodeled periods prior to the start of the first period, ruler A's cost was $\overline{c}$, and in the first period of the game it remains $\overline{c}$ with some probability and drops to $\underline{c}$ with complementary probability.[24]

In light of this interpretation, we consider $\overline{\ell}_*$ to be a historically focal boundary, and we consider two possible outcome paths. The first is the *joint profit maximizing path* in which the rulers maximize joint profit each period. This requires the rulers to set the

[24] All equilibrium conditions that we derive will be necessary equilibrium conditions had we included these prior periods in the model.

boundary according to the realization of A's cost in the first period: if ruler A's cost is $\overline{c}$, then he sells at the monopoly price, v, to almost all individuals to the west of $\overline{\ell}_*$ while B sells at the monopoly price to almost all individuals to the east of $\overline{\ell}_*$; and if A's cost drops to $\underline{c}$ then he sells at the monopoly price, to almost all individuals to the west of $\underline{\ell}_*$ while B sells at the monopoly price to almost all individuals to the east of $\underline{\ell}_*$. The second outcome path is one that we call the *historically focal boundary outcome path*. In this path, ruler A sells at the monopoly price to almost all individuals to the west of $\overline{\ell}_*$ and B sells at the monopoly price to almost all individuals to the east of $\overline{\ell}_*$ regardless of the realization of A's cost. If the realization is $\overline{c}_A$ then the the historically focal boundary outcome path maximizes joint profit, but if the realization is $\underline{c}_A$ then it does not.

The static game equilibrium shortfalls from the joint profit maximizing levels of profit for A and B respectively are

$$\overline{\Delta}_A := \int_{\ell_B}^{\overline{\ell}_*} v - c_B(\ell)d\ell \quad \text{and} \quad \overline{\Delta}_B := \int_{\overline{\ell}_*}^{\ell_A} v - \overline{c}_A(\ell)d\ell \quad \text{when} \quad c_A = \overline{c}_A$$
$$\underline{\Delta}_A := \int_{\ell_B}^{\underline{\ell}_*} v - c_B(\ell)d\ell \quad \text{and} \quad \underline{\Delta}_B := \int_{\underline{\ell}_*}^{\ell_A} v - \underline{c}_A(\ell)d\ell \quad \text{when} \quad c_A = \underline{c}_A$$

If the rulers play the joint profit maximizing path (and thus shift the boundary from $\overline{\ell}_*$ to $\underline{\ell}_*$) after they learn that A's cost is $\underline{c}_A$, then A's payoff is greater by

$$G := \int_{\overline{\ell}_*}^{\underline{\ell}_*} v - \underline{c}_A(\ell)d\ell \tag{12}$$

than his payoff in the case where they play the historically focal boundary outcome path—and therefore maintain the boundary $\overline{\ell}_*$—despite learning that A's cost is $\underline{c}_A$.

Proposition B.4. *The joint profit maximizing path can be supported in equilibrium via the threat of reversion to any static game equilibrium path if and only if*

$$\delta \geq \overline{\delta}_{\text{shift}} := \max\left\{\frac{\overline{\Delta}_A}{\overline{\Delta}_A + \overline{\Delta}_B}, \frac{\overline{\Delta}_B}{\overline{\Delta}_A + \overline{\Delta}_B}, \frac{\underline{\Delta}_A}{\underline{\Delta}_A + \underline{\Delta}_B}, \frac{\underline{\Delta}_B}{\underline{\Delta}_A + \underline{\Delta}_B}\right\} \tag{13}$$

The historically focal boundary outcome path can be supported in equilibrium via the threat of reversion to any static game equilibrium path if and only if

$$\delta \geq \overline{\delta}_{\text{stay}} := \max\left\{\frac{\overline{\Delta}_A}{\overline{\Delta}_A + \overline{\Delta}_B}, \frac{\overline{\Delta}_B}{\overline{\Delta}_A + \overline{\Delta}_B}, \frac{\underline{\Delta}_B + G}{\underline{\Delta}_A + \underline{\Delta}_B}\right\} \tag{14}$$

Proof: Separately applying the analysis of Proposition 2 to the two sets of histories that come after the two realizations of costs establishes that the joint profit maximizing path is supported in equilibrium via the threat of reverting to any static game equilibrium path if and only if (13) holds.

For the historically focal boundary outcome path to be supported in equilibrium via the same threat, we need δ to be weakly greater than both $\overline{\Delta}_A/(\overline{\Delta}_A+\overline{\Delta}_B)$ and $\overline{\Delta}_B/(\overline{\Delta}_A+\overline{\Delta}_B)$ so that the rulers have no profitable deviations at all histories after they learn that ruler A's cost is $\overline{c}_A$. This also follows from applying the analysis of Proposition 2 to the set of histories that follow after the rulers learn that A's cost is $\overline{c}_A$. At histories after the rulers learn that A's cost is $\underline{c}_A$, ruler A has no profitable deviation from the historically focal boundary outcome path under the threat of reversion to the static game equilibrium path if and only if

$$\underline{\Pi}_A + \overline{\Delta}_A - R \geq (1-\delta)(\underline{\Pi}_A + \underline{\Delta}_A + \underline{\Delta}_B) + \delta\underline{\Pi}_A \tag{15}$$

where

$$R := \int_{\overline{\ell}_*}^{\underline{\ell}_*} c_B(\ell) - \underline{c}_A(\ell)d\ell$$

and

$$\underline{\Pi}_A = \int_0^{\ell_B} v - \underline{c}_A(\ell)d\ell + \int_{\ell_B}^{\underline{\ell}_*} c_B(\ell) - \underline{c}_A(\ell)d\ell$$

is A's payoff from the static game equilibrium path after learning that his cost is $c_A = \underline{c}_A$; and therefore

$$\underline{\Pi}_A + \overline{\Delta}_A - R = \int_0^{\ell_*} v - \underline{c}_A(\ell)d\ell$$

is A's payoff from staying on the historically focal boundary outcome path. Simplifying and rearranging (15) we get

$$\delta \geq \frac{\underline{\Delta}_A - \overline{\Delta}_A + R + \underline{\Delta}_B}{\underline{\Delta}_A + \underline{\Delta}_B} \tag{16}$$

Then, noting that

$$\begin{aligned}\underline{\Delta}_A - \overline{\Delta}_A + R &= \int_{\ell_B}^{\underline{\ell}_*} v - c_B(\ell)d\ell - \int_{\ell_B}^{\overline{\ell}_*} v - c_B(\ell)d\ell + \int_{\overline{\ell}_*}^{\underline{\ell}_*} c_B(\ell) - \underline{c}_A(\ell)d\ell \\ &= \int_{\overline{\ell}_*}^{\underline{\ell}_*} v - c_B(\ell)d\ell + \int_{\overline{\ell}_*}^{\underline{\ell}_*} c_B(\ell) - \underline{c}_A(\ell)d\ell = \int_{\overline{\ell}_*}^{\underline{\ell}_*} v - c_A(\ell)d\ell = G \end{aligned} \tag{17}$$

inequality (16) says that δ is at least $(\underline{\Delta}_B + G)/(\underline{\Delta}_A + \underline{\Delta}_B)$. Finally, at histories after the rulers learn that A's cost is $\underline{c}_A$, ruler B has no profitable deviation from the historically focal boundary outcome path under the threat of reversion to the static game equilibrium path if and only if

$$\underline{\Pi}_B + \underline{\Delta}_B + L \geq (1-\delta)(\underline{\Pi}_B + \underline{\Delta}_B + L + \overline{\Delta}_A) + \delta \underline{\Pi}_B \tag{18}$$

where

$$L := \int_{\overline{\ell}_*}^{\underline{\ell}_*} v - \underline{c}_B(\ell) d\ell \tag{19}$$

Rearranging (18) gives us $\delta \geq \overline{\Delta}_A/(\overline{\Delta}_A + \underline{\Delta}_B + L)$. Then note that we have

$$\begin{aligned} \underline{\Delta}_B + L &= \int_{\overline{\ell}_*}^{\underline{\ell}_*} v - c_B(\ell) d\ell + \int_{\underline{\ell}_*}^{\underline{\ell}_A} v - \underline{c}_A(\ell) d\ell \\ &\geq \int_{\overline{\ell}_*}^{\underline{\ell}_*} v - \overline{c}_A(\ell) d\ell + \int_{\underline{\ell}_*}^{\underline{\ell}_A} \max\{0, v - \overline{c}_A(\ell)\} d\ell \geq \int_{\overline{\ell}_*}^{\overline{\ell}_A} v - \overline{c}_A(\ell) d\ell = \overline{\Delta}_B \end{aligned} \tag{20}$$

The first inequality follows because $\overline{c}_A(\ell) \leq c_B(\ell)$ for all $\ell \geq \overline{\ell}_*$, $v - \underline{c}_A(\ell) \geq 0$ on $[\underline{\ell}_*, \underline{\ell}_A]$, and $v - \underline{c}_A(\ell) \geq v - \overline{c}_A(\ell)$ for all ℓ. The second inequality follows because $\overline{\ell}_A \leq \underline{\ell}_A$ and $v - \overline{c}_A(\ell) \geq 0$ for all $\ell \leq \overline{\ell}_A$. Therefore, as a result of (20), if $\delta \geq \overline{\Delta}_A/(\overline{\Delta}_A + \overline{\Delta}_B)$ then $\delta \geq \overline{\Delta}_A/(\overline{\Delta}_A + \underline{\Delta}_B + L)$. Together, these results imply that the historically focal boundary outcome path is supported in equilibrium via the threat of reverting to any static game equilibrium path if and only if (14) holds. □

Under the joint profit maximizing path, peaceful territorial redistributions take place as costs change. While such redistributions have occurred in history, they are rare.[25] It is more common for historical boundaries to persist, which suggests that the historically focal boundary outcome path may be more focal than the joint profit maximizing path. This is also supported in recent work by Abramson and Carter (2016), who find that interstate territorial disputes often have precedents in historical borders. If the historically focal boundary outcome path is more focal than the joint profit maximizing path, then

[25]For example, the Soviet takeover of Bessarabia from Romania in 1940 did not last long. Austria-Hungary's territorial concessions to Italy during World War I, though initially accepted were eventually rejected as being insufficient. And, Nazi Germany's extortion of sizeable territories from Austria, Czechoslovakia and Lithuania in the 1930's were in the context of a nascent World War which ended with these territories being returned to their original states.

our model says that today's boundaries may have once been joint-profit maximizing, but they no longer are.

In the next section, we explore the idea that when there is a genuine change in governance costs that leads rulers to seek more territory, territorial redistributions, if they occur, are the consequence of violent conflict rather than a peaceful transfers.

B.5 Conflict

Consider the extension of Section B.4 but assume that the realization of c_A is unobserved by ruler B. B's prior is that c_A equals $\underline{c}_A$ with probability γ and $\overline{c}_A$ with probability $1-\gamma$. Thus, the shift in A's cost is unobserved by B, who thinks that the cost has remained the same with probability $1-\gamma$ and dropped with probability γ. The game has two "phases." In the first phase, rulers A and B make a sequence of decisions. After they are done, the second phase begins in which they play the game described in Section B.4 as a continuation game, with discount factor δ. The game starts in the first phase with ruler A deciding whether to seek moving the boundary to $\underline{\ell}_*$ or leaving it at $\overline{\ell}_*$. If A does not seek to move the boundary then the second phase begins. If A does seek to move the boundary then B must choose to either agree or disagree. In both cases, the second phase begins but if B disagrees then the rulers engage in conflict, which costs each a flow payoff of $w > 0$. After they each pay this cost, ruler A's true cost is revealed.

We focus on a perfect Bayesian equilibrium with the following properties. If A did not seek to move the boundary in the first phase, then in the second phase the players play the historically focal boundary outcome path of the previous section. If A tried to move the boundary and B agreed, then in each period of the second phase A sells at the monopoly price to almost all individuals to the west of $\underline{\ell}_*$ for whom $v < c_A(\ell)$ while B sells at the same monopoly price to almost all individuals to the east of $\underline{\ell}_*$. If A tried to move the boundary and B disagreed, then the players play the joint profit maximizing path in the second phase. Under an equilibrium with these properties, equilibrium play in the second phase is based on the agreement of the rulers in the first phase, so we refer to an equilibrium with these properties as an *agreement-based equilibrium*. Since payoffs in every continuation equilibrium of the second phase are higher than the individually rational payoffs for each ruler of the continuation game, an equilibrium with such properties exists when δ is high enough.

We characterize behavior under an agreement based equilibrium in the first phase of the game under the assumption that *the cost of war is low enough* in comparison to the

gains and losses in value of territory for both rulers; in particular, we assume

$$(1-\delta)w < \min\{G, L\}$$

where G is the quantity defined in (12) and L is the quantity defined in (19). This assumption says specifically that the cost of war is smaller than the gain territorial value to the low cost type of A from shifting the boundary to $\underline{\ell}_*$ as well as the loss in territorial value to B from making this shift. Under this assumption, both the low cost type of A and B could be willing to use war as a mechanism to reveal costs.

Proposition B.5. *An agreement-based equilibrium exists if δ is high enough. If the war cost is low enough, then in an agreement-based equilibrium:*

1. *If $(1-\gamma)L < (1-\delta)w$, A always seek to shift the boundary and B agrees.*
2. *If $(1-\gamma)L > (1-\delta)w$, then A seeks to shift the boundary when his cost drops, and seeks to shift the boundary with probability*

$$\frac{\gamma}{1-\gamma}\frac{(1-\delta)w}{L-(1-\delta)w}$$

when his cost does not drop; and B agrees with probability

$$\frac{(1-\delta)w}{g+(1-\delta)w}, \text{ where } g = \int_{\overline{\ell}_*}^{\min\{\underline{\ell}_*, \overline{\ell}_A\}} v - \overline{c}_A(\ell)d\ell.$$

Proof: Since $(1-\delta)w < G$ by the assumption that the war cost is low enough, the low cost type of A seeks to move the boundary.

If B agrees then A would want to move the boundary even when his cost is high. In this situation, B would strictly prefer to agree if

$$\overline{\Pi}_B^* - L > \gamma\left[\overline{\Pi}_B^* - L - (1-\delta)w\right] + (1-\gamma)\left[\overline{\Pi}_B^* - (1-\delta)w\right]$$

where

$$\overline{\Pi}_B^* = \int_{\overline{\ell}_*}^{1} v - c_B d\ell$$

is the monopoly profit for B under boundary $\overline{\ell}_*$. This inequality then rearranges to

$$(1-\gamma)L > (1-\delta)w. \tag{21}$$

If B disagrees, then the high cost type of A does not seek to move the boundary. B then infers that if A seeks to move the boundary, his cost is low. In this case, B has a profitable deviation since she would prefer to agree.

Finally, if B mixes between agreeing and disagreeing, she must be indifferent between her two options. This indifference condition is

$$\overline{\Pi}_B^* - L = \left(\frac{\gamma}{\gamma + (1-\gamma)\alpha}\right)\left[\overline{\Pi}_B^* - L - (1-\delta)w\right] + \left(\frac{(1-\gamma)\alpha}{\gamma + (1-\gamma)\alpha}\right)\left[\overline{\Pi}_B^* - (1-\delta)w\right]$$

where α is the probability with which the high cost type of A seeks to move the boundary. From this, we find that

$$\alpha = \frac{\gamma}{1-\gamma}\frac{(1-\delta)w}{L-(1-\delta)w},$$

and note $\alpha < 1$ if and only if (21) holds.

Then, if $\alpha < 1$, the high cost type of A must be indifferent between seeking and not seeking to move the boundary. The indifference condition is

$$\overline{\Pi}_A^* = \beta\left[\overline{\Pi}_A^* + g\right] + (1-\beta)\left[\overline{\Pi}_A^* - (1-\delta)w\right]$$

where β is the probability with which B agrees and

$$\overline{\Pi}_A^* = \int_{\overline{\ell}_*}^1 v - \overline{c}_A(\ell)d\ell$$

is the monopoly profit for the high cost type of A under boundary $\overline{\ell}_*$. The quantity g, defined in the statement of the proposition, is the gain to the high cost type of A from moving the boundary to $\underline{\ell}_*$. Solving this indifference condition gives

$$\beta = \frac{(1-\delta)w}{g + (1-\delta)w}.$$

Lastly, note that if $(1-\gamma)L = (1-\delta)w$ then $\alpha = 1$ and B is indifferent between agreeing and disagreeing. In this case, there is a continuum of equilibria in which B agrees with sufficiently high probability and both types of A seek to move the boundary. □

The proposition reproduces, in our setting, the well-known result in crisis bargaining theory that if the cost of war is sufficiently small in comparison to the value of the disputed territory, then the weak fully pools with the tough (here, low cost) type in challenging the disputed territory when the prior sufficiently favors the tough type, and

partially pools with the tough type in challenging the disputed territory when the prior sufficiently favors the weak type. The tough and weak types correspond, in our setting, to the low and high cost types respectively, and the disputed territory corresponds to the interval $\left[\overline{\ell}_*, \underline{\ell}_*\right]$.

The extension above shows that while tempting to interpret violent redistributions of territory as challenges to the territorial state system, it is possible for them to occur within the framework of the modern state system without disrupting its overall stability. After conflict is resolved, the rulers in our model continue to cooperate to keep profits high. This is exactly the kind of "organized hypocrisy" that Krasner (1999) uses to describe the concept of modern territorial sovereignty. He writes:

> "Westphalian and international legal sovereignty are best understood as examples of organized hypocrisy. At times rulers adhere to conventional norms or rules because it provides them with resources and support (both material and ideational). At other times, rulers have violated the norms, and for the same reasons." (p. 24)

Thus, even when rulers in our model contest territory, this occurs within an equilibrium of long term cooperation.

In fact, this extension also clarifies a key premise of theory—that there is a system of international cooperation in place that is based on the territorial sovereignty norm. Despite his skepticism of the durability of this norm, the premise is consistent with Krasner's (1993) view that "the clearest storyline of the last thousand years is the extruding out of universal alternatives to the sovereign state" (p. 261). While he argues in his 1999 book that challenges to the scope of sovereignty have always existed, and leaders have experimented with other models of international organization, he nevertheless accepts the "dominance of the sovereign state as an organizational form" (Krasner, 1993, p. 261).

C Other Cases

Below, we discuss the process of border making in three additional cases. Three points are apparent: (i) the relative fiscal and administrative privilege of border areas, (ii) the decline of those privileges during the Early Modern period, and (iii) that the decline was temporally associated with cooperative border demarcation and treaty-signing. This represents circumstantial evidence of one of the main predictions of our model: that Early Modern states were able to win back earlier revenue losses stemming from competition.

C.1 Spain

In the 17th century, Spain was a "composite state" including both Castile and the peripheral provinces of Aragon, Valencia and Catalonia (the "crown of Aragon"). These provinces were not subject to Castilian taxation, and enjoyed a set of *fueros* [privileges] that allowed the local nobility to control most posts within the kingdoms, and the right to consent to taxation. Though the lack of a developed central accounting system makes quantification difficult, contemporaries and modern historians are in agreement that Catalonia and Aragon had a much lower fiscal obligation to the crown than did Castile in the 17th century (see, e.g., Storrs (2006, Ch. 5) and Anderson (1979, 71)).

Particularly in the case of Catalonia (the richest of the peripheral provinces), the reluctance to pressure the local elite came from a fear that they would use their location on the border to call in French troops as allies against Castile. In fact, between 1640 and 1652 the Catalan parliament, the General Estates, had done precisely this, after revolting against a royal attempt to create a "Union of Arms" that would equalize military contributions. Louis XIII of France was declared first Protector of the Catalan Republic and Count of Barcelona, while a Franco-Catalan Army fought the Castilians. According to Storrs (2006), throughout the later 17th century, the royal bureaucracy "were constantly aware—and fearful—of the danger of a repeat of the events of 1640-52" (195), which led them to be cautious in their negotiations with the Catalan elite over taxation.

During the War of the Spanish Succession (1701-1715), the Catalans sided with the losing (Austrian) candidate against the winning (French) candidate to the Spanish throne, and were defeated. The cooperation between France and Spain during this period was quite close: the king of Spain was a French prince, most of his ministers were French, and his claim to his throne depended on the French army. This cooperation was made explicit in a series of treaties between the powers (the "family pacts"), in which each guaranteed the possessions of the others. Now that Catalonia was situated between two friendly states, the victors were less inclined to be generous than they had been in 1652—the possibility of playing the two states against each other was remote, and even their former English allies explicitly renounced them (1713). This period thus saw the gradual reification of the Franco-Spanish border. As Sahlins (1989) notes, "it is significant that the first printed map of the Franco-Spanish boundary... was published at the precise moment when the two Bourbon crowns allied themselves" (73).

In Aragon, the Spanish Nueva Planta decrees of 1707 finally abolished the *fueros*, and the administration was reformed to conform to the centralized Castilian model (Lynch,

1989, 64-66). One of the first acts of the reformers was to established new taxes designed to equalize the fiscal burden between Castile and Aragon. The corresponding act enacted in Valencia was explicitly called the *equivalente*. Similar (though less effective) changes in the same period reduced the autonomy of the Basque provinces at the other end of the frontier. Spain would spend the next two centuries a highly centralized state, with little internal variation in administrative structure.

C.2 France

Perhaps the most well-known story of state centralization is that of the French state under Richelieu, Mazarin, and Louis XIV. Faced with a powerful nobility, these rulers worked to undermine feudal privileges and traditional institutions while concentrating authority in centrally appointed *intendents*. These efforts occurred in all parts of France, but their effects were especially pronounced in border areas where previous rulers had been generous to the nobility to compel or entice them to accept French rule. Burgundy and French Flanders, for instance, had formerly been part of the Burgundian state, and were claimed by the Hapsburgs into the early 16th century. Many of these areas retained representative institutions abolished in interior France. In 1600, the average border province had a gross revenue only a fifth of the average non-border province (see, e.g., Beik, 1985, Anderson, 1979).

However, the 17th century was a period of the development in norms of territoriality between France its neighbors, which in effect gave greater power to the central French state in exercising control over its border regions. The Treaty of the Pyrenees (1659) ended twenty four years of war between Spain and France and ended Spanish claims to French occupied territory on both the southwestern and northeastern borders (Sahlins, 1989). On the eastern border, the Peace of Westphalia not only granted new territory to France, but made explicit that several French territories annexed in the previous century, such as the "three bishoprics" of Metz, Verdun and Toul, were not part of the Holy Roman Empire, giving the "chief Dominion, Right of Sovereignty, and all other Rights" to the French King (see Articles 71-74). This process involved powers on both sides of the border working together: a joint Franco-Spanish commission roughly delineated the Pyrenean border over the next several decades (Sahlins, 1989, 34-59).

These changes in sovereign status coincided temporally with fiscal gains for the French state. Quantitative evidence on the fiscal consequences of the incorporation of border regions in Europe (as opposed to the institutional ones) is difficult to come by, but 17th

century France is an exception. Data collected by Mallet (1789) and made available by Bonney (1999) show how French state revenues increased over time for three types of French provinces: those that did not border another kingdom during the 17th century, those that did, and those that did border another kingdom in 1600 but not in 1695, due to Louis XIV's annexations. Due to the lack of annual measures of provincial population or economic activity, it is impossible to compute measures of the absolute tax burden. Nevertheless, from these data, we calculated that between 1600 and 1695, nominal state revenue increased by a factor of only 3.81 in non-border provinces, a factor of 6.20 in regions that were border provinces in 1600 but not in 1695, and a factor of 12.05 in border areas, with the fastest rises coming in the middle of the century.[26]

C.3 Sweden

In 1660, the Swedish monarch ruled a multi-national empire that included modern Finland and Estonia, and portions of modern Latvia and Germany. As in many other such assemblages, the nobility of the peripheral regions enjoyed a set of privileges, of which the most important were the right to exploit the peasantry. In Livland (modern Northern Latvia and Southern Estonia) successive Swedish and Polish kings had granted up to 84% of the land to the nobility as gifts, retaining only 1.25% for themselves (Upton, 1998, 191). By contrast, in Uppland (part of Sweden proper), at most 59% of the land had been given to the nobility and the crown retained a sizable 10% (Upton, 1998, 67).

The crown's greater generosity in Livland reflected the desire to retain the loyalty of the nobility in a region subject to constant border disputes with Russia and Poland. Between the 1620 and 1660, both Sweden and Poland formally claimed Livland, and fought two major wars over its possession, both sides relying on the highly ambiguous legal situation created by the previous primacy (and subsequent collapse) of the Teutonic Knights. In 1660, however, the Treaty of Oliva finally ceded Livland to Sweden permanently, while Russia guaranteed its border with Sweden at Cardis (1661). These treaties were preceded by a decade of major economic growth in the region.

After Charles XI came of age in 1672, he set out, through his Uniformity Policy, to eliminate all political peculiarities among Swedish regions under the slogan of "one king, one law, one people." The most important policy consequence for Livland was the *reduktion*, in which the king confiscated all noble property that had previously been given by the crown, sometimes then leasing it back to its previous owners. Despite

[26]These calculations are based on data in the file MALM031.

feverish protests from the local nobility (who cited earlier royal guarantees made at the time of annexation) the process was successfully completed by the 1690s. The *reduktion* was a financial windfall for the crown, recovering revenues of 5.5 million silver dalers from Livland, and making the province (previously a financial drain) self-sustaining and allowing it to pay a subsidy worth 10% of the central budget (Upton, 1998, 197).

Notably, the areas of the Swedish empire where the uniformity policy was carried out with the least success were its German provinces, where subjects had the option of appealing to another ruler (the Holy Roman Emperor) with whom Sweden had not signed a cooperative border treaty that renounced all rights of intervention. In the province of Pomerania, for example, the Swedish crown recovered a paltry 66,500 silver dalers from the *reduktion* (Upton, 1998, 185). The ability to squeeze peripheral elites was thus dependent on their not having an alternative protector with whom the Swedish monarch was actively cooperating. (Upton, 1998, 185) notes that "The need to respect imperial law limited the possibilities... [the king] was careful not to pursue his argument with the estates to the point where they might appeal for imperial intervention."

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