International
Theory

RESEARCH ARTICLE

War, interaction capacity, and the structures of state systems

Charles Butcher[1]* and Ryan Griffiths[2]

[1]Norwegian University of Science and Technology, Trondheim, Norway and [2]Syracuse University, Syracuse, New York, United States
*Corresponding author. Email: charles.butcher@ntnu.no

Abstract

How have the structures of state systems varied over time and space? We outline a game theoretic model of the decision by political units to accept offers of graded sovereignty from imperial centers. We conceptualize four types of sovereign bargains – tributary, informal extractive, suzerain, and departmental – as a function of whether a polity has external sovereignty and whether resources flow from the subordinate polity to the imperial center through transfers or direct extraction. We then specify the payoffs for these bargains and theorize how increasing interaction capacity and international competition shape the structure of state systems. We show how increasing interaction capacity is related to the transition from transfers to extraction while international competition plays a role only when interaction capacity is already high. We demonstrate the applicability of our model with case studies from low- and high-density environments during the early modern period, respectively: (1) The Oyo Empire of western Africa; (2) Mysore of south Asia.

How have the structures of state systems varied over time and space, and what drives that variation? A recent turn in international relations scholarship has focused attention on non-Western and pre-modern states (Buzan and Little 2000; Herbst 2000; Centeno 2003; Hui 2005; Kang 2010; Phillips 2011; Donnelly 2012; Ringmar 2012; Acharya 2014; Besley and Reynal-Querol 2014; Butcher and Griffiths 2015; Phillips and Sharman 2015; Mattern and Zarakol 2016; Dunne and Reus-Smit 2017; MacKay 2018). One of the aims of getting beyond the European experience to include previously neglected regions is to show variation in political forms and order (Cooley 2005; Cooley and Spruyt 2009; Lake 2009; Donnelly 2015; Mattern and Zarakol 2016). The resulting research is richly theoretical and empirical and it engages a variety of literature such as state formation (Tilly 1992; Ruggie 1993; Spruyt 1994; Philpott 2001; Nexon 2009; Branch 2014) and empire (Doyle 1986; Nexon and Wright 2007; Turchin 2009; Burbank and

Cooper 2010; Go 2011; Phillips 2017). However, attempts to conceptualize and model system structures across space and time remain sparse, and no one to our knowledge has attempted to do so using game theory.

We contribute to this literature by proposing and testing a formal model for comparative systems analysis. It is theoretically grounded in the work on sovereign contracting (Cooley 2005; Cooley and Spruyt 2009; Nexon 2009; Dillon-Savage 2019) and allows us to explore the effects of international competition and interaction capacity on state system structure (Tilly 1992; Ruggie 1993; Spruyt 1994; Buzan and Little 2000; Herbst 2000). We see four types of contracts as especially salient in delineating key contours of international systems: tributary, informal extractive, suzerainty, and departmental. Modern bargains that centralize power in the state are but one among numerous outcomes. These vary as a function of whether a polity has *de-jure* external sovereignty and whether resources flow between polities through transfers or direct extraction. We then specify the payoffs that these bargains imply for an imperial power and a potentially subordinate polity.

The model is used to explore the impact of interaction capacity and international competition on the transition from decentralized to centralized rule. Our analysis shows that international competition in low-density systems creates larger but more decentralized empires while international competition in high-density systems creates larger but more centralized states, conditional on independence being valuable. International competition can accelerate the process of centralization but only in environments where states already have incentives to prefer strategies of direct rule. Furthermore, our analysis questions a key mechanism whereby international competition increases the demand for resources to fight wars and drives more intensive resource extraction (Tilly 1992) by highlighting a constant logic of internal competition where leaders maximize their resources regardless of the level of external competition. Rather, increasing interaction capacity and economic development, especially advances in transport and communications technology, drive transitions to centralized rule by lowering or offsetting the fixed costs of direct rule (Hechter 2013).

We explore these propositions with comparative case studies of the Oyo Empire and Mysore in the late 18th and early 19th centuries. These case studies serve as plausibility probes, enabling us to examine the underlying theory and resulting predictions in different, but matched, historical state systems. The Oyo Empire existed in early modern but pre-colonial West Africa, a state system characterized by low levels of interaction capacity. Mysore existed at approximately the same time in South Asia, a state system characterized by high levels of interaction capacity. Both systems experienced increasing levels of international competition which provides us variation along two dimensions: high/low interaction capacity (density), high/low international competition (war). We find that competition in the low-density Oyo Empire did not induce a shift from transfers to extraction, while there is considerable evidence that the combination of economic development and competition in South India spurred state centralization.

The article targets a gap in the extant literature. Although the recent turn in studying non-Western and pre-modern systems is vital, there has been a tendency to take a particularistic view that discounts universalizing theory (Ringmar 2012; Suzuki *et al.* 2013; Acharya 2014). We accept that every regional system occurred

in a specific context, but contend that there are common patterns across those systems that can be examined and theorized (Buzan and Little 2000). Following Butcher and Griffiths (2017), we focus on culturally neutral concepts like empire that existed in diverse and unconnected systems, and are not rooted in a specific historical locale. The downside to our universalizing approach, in contrast to particularistic analyses, is that we sacrifice depth for breath. The upside is that we can compare across time and space by using a baseline set of concepts. Here, we join the scholarship focusing on more general theory by specifying a formal, parsimonious model of sovereign contracting applicable across historical state systems. To our knowledge, we are the first to take this approach.

In our model, we shift the focus away from sovereign states to contracting polities retaining agency in the absence of external sovereignty. By formalizing the trade-offs implied by these bargains, we refine the mechanisms and identify scope conditions that apply to existing arguments linking international competition to the transition to centralized rule. We also develop new, systematically derived, theory describing how competition may have shaped the structure of international systems in less well-studied, non-European systems such as those in pre-colonial Africa and Southeast Asia (Herbst 2000; Scott 2010). Important contours of the structure of pre-modern and modern international systems may be understood with a unified logic underscoring the costs and benefits of centralized vs. decentralized forms of rule and may be a stepping stone to studying the complex strategic dynamics of multi-polity international systems (Nexon 2009).

The remainder of the article proceeds as follows. First, we describe the model and specify the payoffs for different sovereign bargains. Second, we outline the findings from analytic solutions to the model. Third, we discuss our analysis of the Oyo Empire and Mysore. Finally, we conclude with implications drawn from the study.

A model for comparative systems analysis

We begin by defining four types of sovereign bargains that might obtain between an imperial center and a potentially subordinate (but otherwise independent) polity, building on the work of Lake (2009), Cooley (2005) and Dillon-Savage (2019). Sovereign bargains depend on two factors: (1) whether a polity has external sovereignty in the sense of acknowledging no other polity as sovereign and (2) whether resources flow from the peripheral state to the center through transfers or direct extraction. Configurations of these two dimensions demarcate four common institutional arrangements: (1) tributary, (2) informal extractive, (3) suzerainty, and (4) departmental. In addition, the categories of 'full independence' and 'full absorption' are boundary cases discussed below.

The first actor is the polity P. Polities are territorial entities with some autonomous military organization and the right to act on behalf of subjects in matters of war and peace (Bremer and Ghosn 2003; Butcher and Griffiths 2017). Put differently, polities extract military and economic resources from their territory and have the right to use those resources to bargain with other polities. Polities may have fuzzy or hard boundaries or they may be more or less centralized. The model proposed below is sparse (which we see as an advantage) but this sparsity imposes limitations. It does not incorporate variations in the structure of P

(Gerring *et al.* 2011) or the possibility that imperial centers structure what constitutes peripheral polities (Phillips 2017; MacKay 2018). Polities have 'sovereignty' at the start of the game, which we understand as a 'bundle of rights and obligations' that can be exchanged (Lake 1996, 2009; Krasner 1999; Philpott 2001; Cooley 2005; Cooley and Spruyt 2009). These prerogatives may include foreign policy making, taxation, the mobilization of armed force, leadership succession of the administration of law and justice, among others. Sovereignty includes domestic sovereignty D and external sovereignty S. Domestic sovereignty consists of resources that P extracts directly from its territory, specifically economic and military resources (Cooley 2005; Lake 2009). External sovereignty S represents benefits that P receives with *de-jure* recognition as a 'player' in the international realm (Krasner 1999; Philpott 2001), which can include attracting foreign economic and military aid, international loans, or profiting from international trade in ways that 'non-state' polities cannot (Clapham 1996; Herbst 2000; Fazal and Griffiths 2014).

The second actor is an aspiring imperial power, I, and we assume that P cannot become an imperial power and absorb I. I demands resources from P and P responds with war or transferring S (external sovereignty) or some proportion of D (resources extracted from the territory of P) to I. For simplicity, P can transfer S to I in an all or nothing deal and this is all it can do with S. P ceases to be a state when it cedes control of S, which is where we differentiate states from sub-state polities. For a fuller theoretical justification, see Author's Papers Butcher and Griffiths (2015, 2017). Briefly, this is a thin definition of statehood with roots in international practice and key texts on historical systems analysis (Watson 1992; Buzan and Little 2000), one that elides other considerations such as the effective monopoly of political violence, or what Krasner calls Domestic Sovereignty (Krasner 1999). It was common in pre-colonial systems, however, for polities to cede supremacy to another power, often also accepting limits on foreign policy and the ability to determine successors, whilst retaining domestic autonomy. Polities can thus cede *de-jure* sovereignty but retain some *de-facto* sovereignty that depends upon the ability of the center to coerce compliance with its favored policies.

P can contract with I to share resources from D by making transfers or allowing I to directly extract, which we term transfers and extraction. Polities give a proportion of D without ceding how those resources are extracted with transfers. Under extraction, the imperial center establishes an infrastructure to directly take some proportion of D. Distinguishing between transfers and extraction illuminates shades of sovereignty within and across states. Transfers allow non-state polities to retain wide-ranging autonomy and formally sovereign states can be more or less independent depending on the extent to which other states directly extract resources from their territory (Lake 2009). Common forms of transfers include tribute or suzerain relations where polities give cash-equivalents such as livestock, currency, soldiers, or slaves to another state (Watson 1992; Buzan and Little 2000). An example of direct extraction is when the United States had authority over tax collection and administration in the Dominican Republic in the early 20th century, although the Dominican Republic remained a formally independent state (Lake 2009). The transition from primarily transfer-based bargains to extraction-based bargains is a key process marking the change from decentralized to centralized rule, or the difference between direct and indirect rule. Although we conceptualize

centralization and decentralization primarily in terms of revenue extraction in this paper, the arguments below may also apply to other areas such as policing and the administration of justice.

Transfers and extraction have advantages and disadvantages. Extraction is secure but has high fixed costs. *I* can easily monitor and enforce compliance of extraction but establishing a permanent extractive infrastructure is expensive (Herbst 2000; Cooley 2005). Transfers are attractive because they are cheap in the short term but are risky because the polity can sometimes renege or shirk (Cooley 2005). Moreover, transfers can be inefficient because intermediaries siphon off large sums of income (Tilly 1992, 105).

Combining these two dimensions (state/non-state, transfers/extraction) delineates four political bargains (see Table 1). The first two – tributary and informal extractive – exist when *P* retains its external sovereignty. A tributary relationship is where *P* makes transfers to *I*. For example, the kingdom of Dahomey was independent of the Oyo Empire in the late 18th century but paid an annual tribute of cowries, coral, silks, cotton fabric, and slaves (Law 1977, 165). However, when *P* allows *I* to directly extract resources (while remaining formally sovereign), we call this informal extractive (Doyle 1986).

The next two bargains exist when *P* forfeits its external sovereignty. Of these, suzerainty is where *P* makes transfers to *I*. For example, polities commonly renounce rights to make war and peace and provide the center with material resources (usually soldiers and cash-equivalents) while retaining full sovereignty over how those resources were extracted and distributed after payment (Law 1977; Watson 1992). In contrast, departmental exists when *P* is not externally sovereign and *I* directly extracts from *P*. During the late 18th century in South India, for example, states like Travanacore and Mysore moved from suzerain relations to direct extraction by replacing the intermediary layer of tax farmers with agents directly accountable to the capital (Ramusack 2004).

These four types are non-exhaustive. For example, there are two boundary cases (or types). Where *P* remains externally sovereign, makes no transfers to *I*, and fully controls resource extraction, *P* is the equal of *I* for our purposes. Where a non-externally sovereign *P* gives all extraction rights to *I*, this is full absorption where, for all practical purposes, *P* has ceased to be a polity.

These two dimensions of state/non-state and transfers/extraction help classify a large number of unit-types in historical state systems (see Figure 1). For example, city-states are small states based on extraction. Empires are large states with many *P*s where the ratio of transfers to extraction is high. Modern states are those where the ratio of transfers to extraction is low. These distinctions do not capture the differences between empires and federations, however, and the bargains we analyze apply primarily to cases where 'investiture' flows from center to periphery and not the other way around (Mcconaughey *et al.* 2018, 194–95).

A variety of hypothetical international systems are permitted with these two dimensions and four bargains. Figure 1 shows some configurations that could obtain between one *I* and two *P*s allowing only *I*s to contract with *P*s. The dotted line demarcates polities that have external sovereignty from those that do not and the vertices represent the type of bargain obtained between *P* and *I*. Panel (a) in Figure 1 is a 'centralized' state where *I* directly extracts resources from all *P*s

Table 1. Summary of sovereign bargains

	Transfers	Extraction
External Sov.	Tributary	Informal extractive
No External Sov.	Suzerain	Departmental

while panel (b) is a mixed arrangement and panel (c) is an empire-like decentralized arrangement where Ps retain domestic autonomy but cede external sovereignty. Panels (d)–(e) show systems where one P retains its external sovereignty while having either informal extractive or tributary relations with I. I's relationship with a subordinate P also changes from departmental to suzerainty in panels (d)–(e). These examples are not exhaustive, and although we model one I and one P in this paper, Figure 1 illustrates how this conceptualization could be extended to multi-actor environments. In the next section, we specify the payoffs for I and P of accepting these different bargains.

Payoffs for sovereign bargains

P starts the game with the resources obtained from domestic sovereignty, D, and from external sovereignty, S. D is the sum of all economic and military resources that could be extracted from P's territory. S is the utility that P gains from being formally recognized as a 'player' in the state system such as freedom to make foreign policy without imperial oversight and access to military and economic aid available to 'states' and not 'non-state' polities. Polities do not expect to remain independent in perpetuity, however, and S is discounted by the likelihood of survival into the future, $p_s[0, 1]$. P can contract with I to share the resources contained in D via either transfers or extraction and/or by ceding external sovereignty, losing the utility from $p_s(S)$.

   The payoffs for each type are as follows (see Table 2). In a tributary relationship, P maintains control of D and $p_s(S)$ but makes a transfer $t[0, 1]$ to I which is a proportion of D (i.e. tD). For I, this transfer (tD) is discounted by $m[0, 1]$, which is the probability of I receiving the full amount. P keeps what is left over after the transfer $(1 - t)D$ plus what it successfully reneges on, $(1 - m)tD$ and this is also discounted by the probability of surviving into the future (i.e. p_s). Although m could vary from 0 to 1, shirking and the ability of intermediaries to cream off funds mean that transfers are never worth their full amount to I.[1]

   In relationships of informal extraction, P retains $p_s(S)$ but allows I to extract a proportion of D directly, which we call tD for consistency. P keeps all of $p_s(S)$ and what is leftover of D after I's extraction (i.e. $(1 - t)D$), again discounted by p_s. I receives tD but must construct an infrastructure to extract it which costs d (i.e. $tD - d$). The term d reflects the costs of infrastructure, displacing the local elites, maintaining a military presence, building roads, collecting taxes, or directly putting down uprisings. We follow Herbst (2000, 24, fn 53) and treat these as fixed costs which are subtracted from D. When d is low, the costs of direct rule are low,

---

[1]With extraction, I takes more of P's resources because resources lost to I through shirking are preserved.

Note: Dotted ovals indicate boundaries of external sovereignty. Dashed lines indicate transfer relations. Solid lines indicate extraction relations.
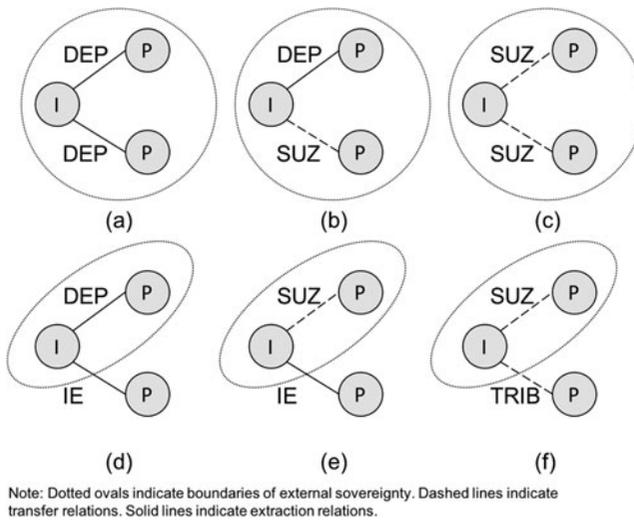
Figure 1. Variations in sovereign bargains.

when d is high, they are high. Other factors such as 'prevailing norms identities and institutions' that 'facilitate the incorporation of one polity into another' (Nedal and Nexon 2019, 170) could also lower d (see also Go (2008)).

Under suzerainty, P loses the benefits of $p_s(S)$ (i.e. its external sovereignty), but keeps control of D minus transfers made to I but keeps $(1 - m) tD$, reflecting shirking opportunities. These payoffs are not discounted by p_s as we assume that P receives some level of 'protection' from I. We are treating p_s as 1 in suzerainty and departmental bargains where the difference between 1 and p_s reflects how valuable protection from I is to P. I receives mtD and a benefit b for controlling the external sovereignty of P. In departmental, P loses the value from $p_s(S)$ and allows I to extract a proportion of D directly, retaining what is left. I takes $tD - d$ and obtains a benefit, b, from controlling the external sovereignty of P.

What determines the value of t (i.e. the proportion of D that P is willing to give up)? Both sides are bargaining 'in the shadow of war' and we set t as the division of D that would occur if both sides agreed to divide D by the probability of winning a war, without paying the costs of war (Fearon 1995). Thus, t is the most efficient division of D for I before the costs of war, extraction and shirking opportunities such that t equals the probability of I winning an armed conflict, $1 - p_v$ [0, 1]. Recall that t is not worth its full amount to I, either because it has to pay the costs of installing the infrastructure to extract it (d) or because sometimes P will renege on the payment (m). I and P have an outside option of war to enforce any of the bargains discussed above, with some probability (p_v, $1 - p_v$) of winning the war with costs (C) in lives and material. An alternative is that I threatens P with a war to take all of D and removes P's sovereignty and then P gives all of D right up to this reservation point. However, states could not credibly threaten such direct rule wars in many pre-colonial settings due to the high fixed costs of extraction

Table 2. Summary of payoffs

Arrangement	P	I
Tributary	$ps(S) + (1-t)Dp_s + (1-m)tDp_s$	mtD
Informal extractive	$ps(S) + (1-t)Dp_s$	$tD - d$
Suzerain	$(1-t)D + (1-m)tD$	$mtD + b$
Departmental	$(1-t)D$	$tD - d + b$
Conflict	$pv(\text{Arrangement}) - C$	$(1-pv)(\text{Arrangement}) - C$

S = the value of external sovereignty; D = the value of resources extracted from the territory of P (economic and military); p_s = the probability of P surviving into the future; p_v = the probability of P winning an armed conflict; t = the amount of D that P is willing to give to I; m = the probability that I receives the full amount of t in transfers; d = the fixed costs of extraction; b = the security benefit to I for controlling the foreign policy of P; C = the direct costs of battle.

(something that our model highlights). Instead, wars were often to extract tribute or to enforce suzerainty arrangements.

Which agreement occurs in equilibrium depends on whom we assume moves first (McCarty and Meirowitz 2007). If I moves first, then it gets its best option that does not trigger P's highest reservation point (i.e. war payoff) unless P's reservation point is so high that I is better off fighting for its preferred option. If P moves first, then it gets its favored option without triggering I to fight (unless I's reservation point is very high). These are equilibria, neither side has incentives to defect. We assume for the analysis below that I moves first and what I gets in equilibrium is determined by its preference ordering of the four bargains and P's willingness to resist these arrangements. In the Appendix, we allow P to move first, and the predictions for H_1–H_3 (discussed in more detail below) are the same. H_4 does not hold if we allow P to move first, but taken together, any effects of international competition on fiscal centralization should be limited to higher density systems. This is a coercive bargaining model where the stability of peaceful arrangements is underpinned by the threat of armed conflict. Peaceful relations between polities can be sustained by institutions for monitoring and compliance, federal arrangements, shared culture, and exchange that we do not model here (i.e. Deutsch 2015).

The model assumes that bargaining occurs *before* states fight (Fearon 1995). Imperial powers sometimes fight first and negotiate later, however. These acts can be consistent with bargaining models where they are designed to signal capabilities to polities other than the target polity, or are costly signals short of 'war' (Reiter 2003). We argue that it is generally safe to assume that bargaining often precedes war, even in lower density systems. For example, Wilks (1989, 218) notes that 'the course of Ashanti history in the nineteenth century – not least in the sphere of Anglo-Ashanti relations – bears witness to the lengthy and often costly negotiations that the Ashanti Kings felt obliged to conduct before resorting to the use of force' (see also Smith (1988, 4)). May (2013, 132) notes that the Mongols understood that 'it was more efficient to convince a city or fortress to surrender without resistance rather than be drawn into a siege'.

Tables 2 and 3 summarize the payoffs for sovereign bargains. In the following section, we discuss the concepts of international competition and interaction capacity, followed by their operationalization in the model.

Table 3. Non-technical summary of payoffs

Arrangement	*P*	*I*
Tributary	Retains sovereignty and shirking opportunities	Payment minus shirking
Informal extractive	Retains sovereignty but can't shirk	Full payment minus fixed costs
Suzerain	Loses sovereignty but retains shirking opportunities	Payment minus shirking plus security benefits
Departmental	Loses sovereignty and can't shirk	Full payment minus fixed costs plus security benefits
Conflict	Probability of winning a conflict for the most preferred option minus the costs of war	Probability of winning a conflict for the most preferred option minus the costs of war

Interaction capacity and international competition

To summarize, territories contain a pool of resources that can be transferred or extracted, but states are constrained by the relative costs of doing so. Extraction involves high fixed costs but secure payments (Herbst 2000, 24) while transfers involve marginal costs but are risky and inefficient. States benefit from subordinating other states in the international system while potentially subordinate polities can sometimes enjoy benefits from existing as a 'state'. We now explore the role of interaction capacity and international competition in driving changes in relations between P and I. Buzan and Little (2000, 80) define interaction capacity as a technological variable capturing 'the amount of transportation, communication, and organizational capability' within the system, similar to Ruggie's notion of dynamic density (Ruggie 1998). Increases in interaction capacity are linked to the transition from indirect to direct rule (Tilly 1992; Scott 2010). In our model, transport and communication costs may fall with better logistics, organization, or cultural homogeneity, lowering d. Trade, natural resources, and higher population density may increase the size of D, or the quantity of military or economic resources that could be extracted from D (Herbst 2000; Tilly 1992, 108).[2]

International competition is also thought to drive state formation/consolidation (Tilly 1992, 70). We conceptualize international competition as military competition that raises the potential for armed conflict between states. Competition has two potential effects in our model. First, if I is threatened by powerful states, it might increase the value of b – the utility to I of controlling P's external sovereignty. P is a potential ally for competitor states in a hostile environment. Peripheral states may also shorten their time horizons (i.e. lower p_s), especially if international competition increases the value of controlling peripheral states' external sovereignty for all states. A key tenet of the 'war makes states' argument is that competition increases I's demand for P's resources, stimulating the transition from indirect to direct rule (Tilly 1992, 114). However, our model raises the question of why I

---

[2]We assume the land area of P is constant so increases in total population equate to increases in population density.

does not already take as much as possible through transfers or direct extraction. States may want more when threatened by larger states, but unless competition lowers the costs of extraction, makes transfers more inefficient, or increases the willingness of polities to give up more, then it may not cause centralization unless other foundations (such as high interaction capacity) are in place first.

Interaction capacity and international competition are related but analytically distinct variables. Interaction capacity is a function of the speed and cost with which information and goods can travel across a system (Buzan *et al.* 1993; Buzan and Little 2000, 80–83) that constrains the frequency of interactions without determining the nature of those interactions. Whether interaction capacity results in more peaceful (i.e. less competitive) or more conflictual (i.e. more competitive) relations depends on other factors such as past levels of interaction and diplomatic structures, cultural norms, the economic value of increased interaction and exchange, and the implications of technology for the offense–defense balance (Jervis 1978; van Evera 1998). Deudney (2007) argues that 'violence interdependence', or the ability of units to damage each other with physical force, creates incentives to regulate and minimize violent interactions through institutions rather than necessarily generating more competition. For example, a rise in the ability to transport goods could result in trade and a high 'peace dividend' that prevents wars or it could mean the entry of new players that increase the level of competition. Even power transition theories that tightly connect technological developments to industrialization and international competition allow for peaceful or conflictual transitions depending on the economic benefits for the declining power (Organski 1958). On a conceptual level, therefore, interaction capacity increases the ability of units to interact, but it does not logically follow that those interactions are conflictual.

Moreover, international competition varies independently of interaction capacity. Competition depends on leaders and their regimes, ideology, military doctrine, changes in military technologies, and the offensive capabilities of the units, among other factors. For example, the introduction of the gun and the end of the slave trade in 1807 changed the level of military competition in pre-colonial West Africa (Fenske and Kala 2017), but neither changed the (low) level of interaction capacity. A revolutionary leader with imperialist ambition can increase competition while interaction capacity remains the same (Colgan 2013). Buzan and Little (2000, 278–279) note that ground transportation speeds changed little in Europe before the late 18th and early 19th centuries, while great-power military competition fluctuated (Levy 1982). As such, we argue that treating these as distinct concepts in the formal model is justified.

Perhaps international competition is fundamentally different across low- and high-density systems. Warfare in low-density systems may be marauding and raiding rather than the highly destructive wars witnessed in Europe. First, our model only commits us to assume that competition is threatening to the survival of leaders. So long as increased international competition increases the threat to a ruler's hold on power, then our comparisons are valid. Taking for granted that warfare in higher density systems is threatening to incumbent rulers, existing historical work suggests that wars were threatening to leaders in lower density systems. As just one example, Smith (1988, 39) states that 'the fundamental cause of most West African

wars – and indeed the most prevalent cause of wars in any part of the world – was the desire of the more vigorous societies for territorial expansion and to exercise a measure of physical control over their neighbors'.

Why does interaction capacity not decrease the value of m (the ability of P to shirk from transfers)? Our assumption is that increasing interaction capacity does not decrease m independently of the state paying some fixed costs (i.e. d) to thicken the infrastructure of the rule. For example, the Mughal Empire implemented a system of land taxes where state officials would assess agricultural production and adjust the taxation level thereupon, reducing the ability of local tax collectors to misrepresent harvest levels and profit from such information asymmetries (Richards 1995, 79). However, independent of the state establishing these more permanent institutions to monitor production levels (i.e. paying some fixed costs), we argue that there are few strong conceptual reasons to think that rising interaction capacity necessarily decreases m.[3]

We also assume that competition does not change p_v. Links between increased international competition and military capabilities exist through mobilization and denser alliances with states and insurgent groups (Kalyvas and Balcells 2010), but it is not clear in which direction this influence should run. We make the safer assumption that competition can increase absolute military capabilities but there are few strong *a priori* reasons to think that it systematically favors I or P. We relax this assumption in the Appendix, and show that it does not significantly alter our main conclusions.

Finally, while our model is dyadic, international competition and interaction capacity can be thought of as systemic variables. We expect the dynamics below to unfold across systems with changes in these systemic variables.

Hypotheses

Here we outline the utility of the conceptual model by considering how interaction capacity and competition impact the transition from transfers to extraction. Proofs can be found in the Appendix. We assume that interaction capacity increases the value of D and decreases the value of d and that war and international competition increase the value of b and decrease the value of p_s. We make four claims: (1) low-density (i.e. low interaction capacity) systems are composed primarily of 'composite' states, (2) international competition does not cause a change in I's preferences for transfers or extraction as many current versions of the 'war makes states' hypothesis would imply, (3) increasing interaction capacity does cause a change in I's preferences from transfers to extraction, and (4) international competition can cause extraction to become an equilibrium solution, but only where I already has preferences for extraction strategies and the value of 'independence' (i.e. S) for P is high. The propositions are explained informally below.

First, international competition does not cause a change in I's preferences for transfers vs. extraction. This is because the benefits of controlling P's foreign policy accrue to I under transfers and extraction. From I's perspective, competition cannot

---

[3]It is possible that I can pay some amount less than d to reduce m, which could be a useful extension. We thank an anonymous reviewer for pointing us in this direction.

make it more cost-effective to directly extract economic resources given the fixed costs of doing so. Faced with internal competition, *I* should already be maximizing the resources it takes from *P*, given constraints on projecting power, and competition does not alter these constraints.

Second, changes in interaction capacity can shift *I*'s preferences from transfers to extraction. This is because the value of extraction to *I* is a function of *d* and *D*. As *d* goes down or *D* goes up, the utility of extraction increases. A reduction in *d* makes it cheaper for *I* to implement the short-term costly but long-term an efficient method of extraction, while increasing *D* means that the absolute value of the difference between what *I* gets from transfers vs. extraction increases to a point where it may offset the fixed costs of extraction.

The result of points (1) and (2) is that low-density systems should be composed of 'composite states' based mainly on transfers, with pockets of extraction in high-value areas or where fixed costs are low. Competition (i.e. war) should not induce centralization in low-density systems. Increasing interaction capacity should.

Finally, competition may cause centralization but only in higher density systems where *I* already has preferences for extraction and being sovereign is valuable. Here *I*'s demand for resources does not increase – it should always demand the maximum resources through the most efficient means – rather international competition reduces the bargaining power of *P*, making *P* more likely to accept *I*'s demands for extraction. This occurs because fighting for a tributary arrangement is often *P*'s exit option (and reservation price) and can be high enough that *P* will fight for tributary over accepting extraction. Sometimes, *I* will settle for a lower preference such as suzerainty to compensate *P*. As international competition makes *P* less secure, its reservation price falls and *I* is more likely to get its first preference. This final result highlights an important role in the expansion of international *society* (Bull and Watson 1984; Dunne and Reus-Smit 2017). Increased connections among states can thicken shared norms, expectations, and benefits around statehood. In general, the increasing value of statehood strengthens the bargaining hand of subordinate polities through a higher reservation price, with the caveat that this bargaining power declines faster with increased international competition.

Notice, however, that this mechanism is only activated when *I* already has preferences for extraction-based strategies. If its first preference *vis-a-vis P* is suzerainty, then competition will produce more suzerain relations as *P*'s seek protection in *I* but retain domestic autonomy. This potentially clarifies the aspects of Tilly (1992, 110, 114) where he describes competition as a cause of centralization in places and as an accelerant in others. Our model suggests an accelerant interpretation and our reading of France's transition to direct rule (1789–1793) in Tilly (1992, 107–114) speaks to existing economic development and the willingness of Napoleon to pay the fixed costs of direct rule in conquered territories rather than international competition (see also Dincecco (2009) for quantitative evidence). We emphasize, however, that this effect should overall be smaller than the centralizing influence of increasing interaction capacity and it is highly dependent upon what the costs of war are. If *I*s sometimes go to war with other *I*s and the costs are high, then this may destroy fiscal capabilities, making it less likely that it can pay the fixed costs of extraction.

The four hypotheses derived from the model are below:

H1: *States in low-density systems are characterized by transfer-based relations (i.e. are primarily composite polities).*
H2: *International competition is not related to state centralization in low-density systems.*
H3: *Increasing interaction capacity is positively related to state centralization.*
H4: *International competition is positively related to state centralization in high-density systems.*

Additional considerations and extensions

We also considered variables other than competition and interaction capacity that may drive changes in state systems. Developments in military technology favoring I mean that I can demand a higher t from P. Insofar as technological developments that enable direct rule to be expanded more cheaply also enable imperial powers to more effectively project force over space, this will result in a shift to extraction-based strategies and a deepening of that extraction. But military force will not do it alone – advances in military technology that increase the chances of I winning a war without decreasing the costs of direct rule will allow I to extract more, but it is unlikely to change the form of extraction unless D is high or d is low. So too with the costs of war, increasing costs of war reduce P's bargaining power, but will only result in a shift from transfers to extraction when I already has preferences for extraction that it can now realize because P is in a weaker bargaining position. The model here suggests that two additional arguments made for centralization – advances in military technology and the costs of war – have conditional effects on centralization that depend on latent but unrealized preferences for extraction.

We have also assumed that transfers are inefficient for I because P has opportunities to shirk and tax farmers take money through corruption. However, technological developments in communications technology may enable states to monitor transactions and the economic activity of other states/polities more efficiently (North 1990). Increasingly efficient transfers (i.e. higher m) have the effect of making I prefer transfer-based strategies of rule (suzerainty and tribute) over extraction-based strategies. Transfer-based strategies preserve resources expended as fixed costs and thereby leave the largest pie to be divided. Centralization (extraction-based strategies) can therefore be seen as a way in which imperial powers overcome commitment problems with potentially subordinate polities that may promise to transfer a sum and retain their autonomy, but cannot credibly do so due to shirking opportunities. Direct rule is a solution (albeit an expensive one) to this problem. Low transaction costs could drive a transition to increasingly decentralized and transfer-based polities.

A comparison of two historical systems

We now turn to a comparative case study of the Oyo Empire in the 18th and 19th century West Africa and Mysore in South India during roughly the same period.

The Oyo Empire was embedded in a low-density system while Mysore was embedded in a higher density system. Both systems (and states) faced increased competition from Europeans and other local states, but in Mysore, Tipu Sultan was able to centralize tax administration, while in response to similar pressures, the Oyo Empire was unable to do so, and eventually collapsed.

The Oyo Empire

The Oyo Empire existed between 1600 and 1830 and covered 18,000 square miles at its peak in 1780 and probably ruled more than 750,000 people (Asiwaju 1989, 704). West Africa was a low-density area compared to South Asia at the same time (Herbst 2000; Oliver and Atmore 2001). There was no wheeled transport or 'beasts of burden' and horses were not used for transport. Law (1977, 209) states that 'in these conditions the cost of transport was high and precluded the possibility of substantial trade over long distances of basic foodstuffs and other commodities of great bulk and low value' (Adeleye 1971, 6–7). One estimate is that caravans could travel, at the upper limit, 8–10 miles a day in the savannah of the nearby Asante Empire, with many journeys being much slower (Wilks 1989, 31). The structure of the Oyo Empire fits with our predictions for low-density environments. The head of state was the *Alafin* who exercised direct control over the capital city, Oyo Ile, while the 'kingdom of Oyo' consisted of towns that were under the suzerainty of the *Alafin* with varying degrees of internal autonomy. These towns paid tribute to the center, both acknowledging it as the final juridical authority and subordinating control of foreign affairs (see Akinjogbin (1966), Morton-Williams (1967, 37) and Smith (1988)). Yoruba states generally exhibited this structure: the center claimed authority to conduct external affairs, preside over capital crimes, and appoint head chiefs, while subordinate polities retained internal autonomy otherwise (Ejiogu 2011, 597). Beyond the kingdom were states such as Dahomey that had formal independence but paid tribute to the *Alafin*. Oyo was a large but decentralized state in a low-density environment (see Figure 2).

Oyo Ile, in modern day Oyo state in Nigeria, was the seat of power and residence of the king, or *Alafin*, and the center of the state's administrative machinery. The administrative staff consisted primarily of several thousand palace slaves and eunuchs that managed the executive, judicial, religious, and administrative tasks of the empire, including the collection of revenues (Akinjogbin 1966). Some taxes were collected directly at the palace gates in Oyo Ile, depending on the value of commodities being imported and exported, but there was little other direct taxation in the city. The *Alafin*'s power in Oyo Ile was constrained by a council of seven advisors called the Oyo Mesi who represented the main royal lineages in the city, and especially the *Basorun* who was the commander of the armed forces in Oyo Ile (Law 1971; Morton-Williams 1967, 41).

Outside of Oyo Ile were towns under the suzerainty of the *Alafin*, organized into provinces with some having a head town, such as the cities of Saki and Iganna (Law 1977, 88). Variations in bargains between the center and the towns reflected 'what he [the *Alafin*] could get away with' but the suzerain relations described below generally held across the empire. Towns/polities were forbidden from engaging in foreign policy – they could not make war or form alliances with other polities (Law
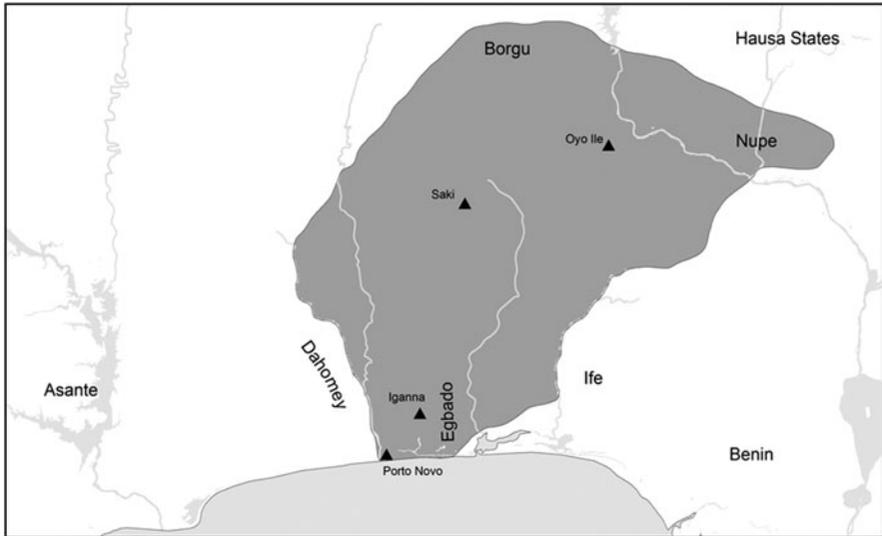
Figure 2. Oyo Empire.

1977, 100). They were obliged to bring payments (i.e. transfers) to the *Alafin* that were provided at the annual Bere festival in Oyo Ile, but retained wide-ranging autonomy over how those resources were extracted. Payments consisted of livestock, grasses used for thatching, and cowries (cash) (Akinjogbin 1966, 450). For example, the large town of Saki paid two rams and 10 bags of cowries annually (Law 1977, 100). Tribute was unreliable. For example, 'in 1775 Kpengla attempted to evade the payment of coral as part of the tribute to Oyo on the plea that none was obtainable from European traders' (Law 1977, 174) and successfully evaded paying tribute on two other occasions. Taxes were not directly collected by the *Alafin*, state revenues were obtained from religious dues in the capital, loot from warfare, judicial fees and fines, and the annual tribute festival (Akinjogbin 1966; Morton-Williams 1967). A palace slave (*ilari*) stationed in tows outside of Oyo Ile acted as the 'eyes and ears' of the *Alafin*; however, there may not have been more than one *ilari* per town (Asiwaju 1989, 704).

Oyo was bordered by large and small kingdoms including Dahomey and Benin, two formidable (and comparatively centralized) states in West Africa. Oyo came under pressure from, and was eventually and conquered by, the Sokoto Caliphate in the late 1820s and early 1830s (Paz 2014, 36). These kingdoms were independent – the *Alafin* had neither authority over nor controlled the foreign relations of these states, in a number of accounts. Some of these kingdoms paid tribute to Oyo, however, reflecting our tributary arrangement (Adegbulu 2011, 173). Dahomey, for example, was independent of Oyo in the formal sense, but sent roughly 8,000,000 cowries to Oyo that was collected annually on the border. Law argues that this tribute was to prevent the *Alafin* from raiding their territory (Law 1977, 168). Some states on the northern border acknowledged the *Alafin* as the elder brother and agreed to the exchange of gifts but were specific about the arrangement

not being a tributary one. These states remained independent because they were 'too remote from the centre of Oyo for a major Oyo military presence to be maintained there' (Law 1977, 179).

Oyo faced increasing international competition toward the beginning of the 18th century and beginning of the 19th century from Dahomey and the Sokoto Caliphate (Asiwaju 1989, 707). Oyo was insulated from European influence and its institutional responses were indigenous (Ejiogu 2011). Some centralization occurred toward the end of the 18th century and beginning of the 19th century in the province of Egbado, which was colonized by Oyo in the 1770s or 1780s and was on the slave trading route linking the interior to Porto Novo. This centralization consisted of a series of turnpikes where taxes were directly levied on goods (primarily slaves) in transit to and from the coast. However, Law argues that this change in Egbado was caused by the higher volume of trade (i.e. increasing D) in the region rather than increased military competition. Indeed, Law argues that Oyo's experiments in centralization were limited and ultimately failed as Oyo fragmented and declined by 1830.

Increased competition in the 18th and 19th centuries did spur some peripheral states to switch from tribute to suzerain relations, a finding that is consistent with our model. For example, Usman (2000, 46) notes, based on archaeological evidence, that 'the presence of aggressive groups like the Nupe, and the Ibariba to the north, might have stimulated the unification of the Igbomina [a peripheral state] under Old Oyo control, providing a common leadership and defense'. There are also other examples of competition in West Africa causing states to band together in loose suzerain relations, creating bigger, but decentralized, states (Sanders 1979).

Overall, the structure of the Oyo Empire was common in West Africa during the period. While experiments in centralization were taking place in kingdoms like the Massina caliphate, the majority of states – the Sokoto Caliphate, the Tukolor Empire, Futa Jallon, Futa Toro, the Mandika empire – were all decentralized polities (Ajayi 1989; Person 1989) and no states that we are aware of switched from transfers to extraction before colonization. Even states that faced longer exposure to modern European warfare did not switch to extraction. For example, the Ashanti were competitors with the British from the first Anglo-Ashanti war in 1824 until 1900 when the Ashanti Empire was conquered. The Ashanti revenue-gathering apparatus changed little over this period. Revenue gathering in provinces outside of the metropolitan area around Kumase was taxed with tributary payments. Areas within the metropolitan area were taxed more directly through poll taxes, death taxes, road tolls, and taxes on gold mining (Wilks 1989, 70). As competition intensified in the 1870s, the king attempted to modernize the military (Wilks 1989, 616). These costs, which included purchasing modern rifles and hiring Hausa mercenaries, were funded by increasing taxation on the emerging merchant class and gold mining within the metropolitan region (Wilks 1989, 529–30, 703), not by switching from transfers to extraction in tributaries. Ashanti responded to military competition by trying to extract more where the fixed costs were low (i.e. provinces closer to the capital). Our model also jibes with quantitative studies finding that war did not spur state-building in Africa before colonization (Osafo-Kwaako and Robinson 2013).

Mysore

Mysore is located in the south-west of modern day India (see Figure 3). Mysore was a successor to the Vijayanagara Empire, a vast transfer-based empire in southern India with a small administrative core networked by extensive suzerain and tribute relations (Stein 1985). Mysore declared independence from the Mughal Empire formally in 1783 but the *de-facto* power of the Mughals had deteriorated since 1707 such that the Marathas, Nizam of Hyderabad, and other South Indian kingdoms were *de-facto* sovereigns during this period that retained Mughal titles and insignia to legitimize domestic rule (Habib 2002, 75). Persian and Afghan rulers recognized Mysore as an independent monarchy during the reign of Haidar Ali (Yazdani 2017, 84). The population density was 10 times higher in South Asia than in sub-Saharan Africa in 1750. Mysore's population was probably 6 million people and population density was roughly on par with Scotland at the same time, with extensive monetary systems, road networks, and integration into the international economy (Herbst 2000; Yazdani 2017, 15, 11). South Asia, and Mysore in particular, may even have experienced 'proto-industrialization' through the development of local merchant capitalism that approached conditions seen in Europe prior to 'full' industrialization (Perlin 1983). Yazdani (2017, 198) notes the presence of textile manufacturing, especially in major cities such as Bangalore, but also iron and steel manufacturing and that 'per capita agricultural productivity in Mughal India was not in any way backward when compared with other contemporary societies, including those of western Europe'. Yazdani (2014, 114) also notes that the transportation and administration infrastructure in Mysore was 'pre-modern' and acted as a threshold on how far the center could expand its extraction infrastructure. Wheeled transports and oxen were utilized such that bulky materials (148–185 kg) could be transported between 19 km and 24 km a day, and with cannons, Ali could travel 162 km in 2 days. Thus, travel times for traders were somewhere between two and eight times higher in Mysore when compared to West Africa.

The late 18th century was also a period of intense military competition. Mysore fought major wars against the Marathas and Hyderabad (1784–1787) and four wars with the British East India Company (EIC) and her allies (1767–1769, 1780–1784, 1790–1792, 1799) that resulted in the conquest of Mysore in 1799 (Yazdani 2014; Barua 2005, 84).

Unlike Oyo, and as our model would suggest, Mysore transitioned from a transfer-based state to direct extraction first under the rule of Haider Ali (1722–1782) and then his son, Tipu Sultan (1753–1799). When Ali came to power in 1761, he inherited a kingdom based largely on transfer-based suzerain relations (Stein 1985) and his main innovation was to centralize the control of horses and cannon in addition to making use of French military officers (Ramusack 2004, 31). A major achievement was wresting military power from hereditary chiefs who would be called upon to provide military service and replacing it with a large standing army.

The main economic innovations occurred during the reign of his son, Tipu Sultan, who ruled from 1782 until 1799 when he was defeated and killed by the British. Stein (1985) states that 'until the time of Tipu Sultan, no military regime in the South, whether Muslim or Hindu, was able to shift most of its income
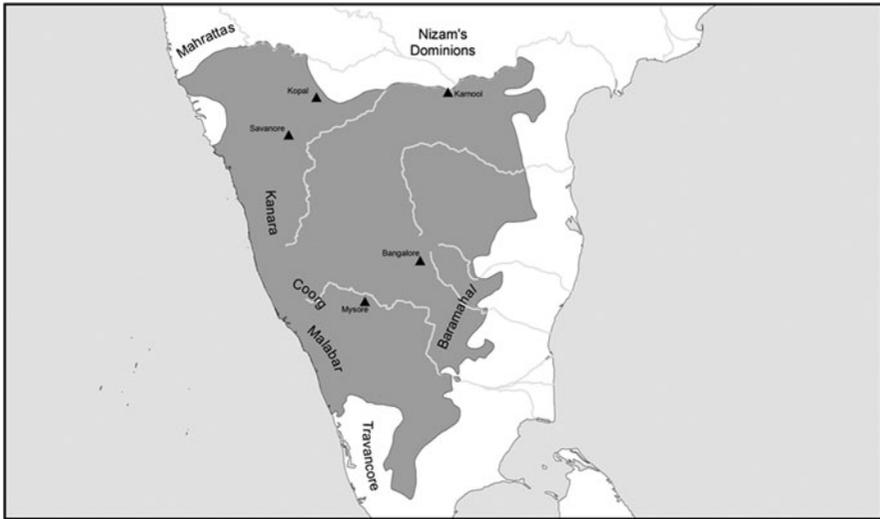
Figure 3. Kingdom of Mysore and the surrounding region.

from tribute … to the direct collections of state officials'. Tribute payments in India were inefficient because they were 'irregular and only realized by threats' (Stein 1985, 392). Tipu Sultan himself apparently believed that tax farming was 'inefficient' due to revenue lost through venality and corruption (Gopal 1971, 75). Gopal (1971, 83) states that Mysore's vassals were 'irregular' in payments with 'large sums outstanding'. Tipu wrote to the Nawab of Savanore (a vassal of Mysore) in 1786, for example, stating that 8 lakhs of rupees were due and to the Nawab of Karnool stating that 4 lakhs were owed (Gopal 1971, 83).

Tipu Sultan's administrative reforms were designed to displace local tax farmers with 'central fiscal institutions' and 'directly extract surpluses from the productive level of society without the mediation of powerful intermediary groups' (Stein 1985, 391). Interior and border taxes on trade were already levied prior to Ali and Tipu – thus, the direct extraction of revenues was already more prevalent than in the Oyo Empire at the same time. Economic reforms began under Haidar Ali but 'accelerated' under Tipu (Yazdani 2017, 138). Tipu, for example, created a civil bureaucracy charged with levying taxes, and it absorbed as much as 25% of revenues by the end of his reign, constituting a 'veritable primitive public sector' (Gopal 1971; Yazdani 2014, 275). The main administrative staff in towns and cities were the *amidari*, headed by the *amidar* and assisted by a *serishtadar*, *amin*, and *muzumdar*. The *amidar* sat above the local hereditary chiefs in rural areas and acted largely as tax farmers early on, although limited in their autonomy by government regulations. Prior to Tipu Sultan, these tax farmers had been successful warriors and often members of the Brahman caste with wide ranging authority, but the Sultan pensioned many of them off and reigned in the power of the *amidars* (Stein 1985). *Amidars* were, for example, banned from extracting more to make up shortfalls and were punished if villagers fled due to the depredations of the *amidar*. Supplies required for administration were provided by the state and the amidar

was banned from receiving goods and services for free (Gopal 1971, 66). After the 1792 treaty with the British, which nearly halved the territory of Mysore, the kingdom underwent further rationalization and reorganization. The territory was divided into 37 *assofies* with roughly 20–30 *taluks* below them as the main administrative units. *Assofies* had a staff of roughly 47 civil servants to assist with revenue collection and each taluk was staffed by roughly 15 civil servants (Gopal 1971, 70). This administrative staff directly levied land taxes which made up, perhaps, 70% of the kingdom's revenue. The land was inspected and assessed by the state's administrative staff and taxes were to be paid directly, and in cash, to the local officials. These staff assessed local production and revenue collections were recorded by accountants that were in part salaried by the state and prohibited from cultivating lands themselves (Stein 1985, 402).

State expansion and penetration was stimulated by investment in roads by Ali and Sultan, especially in the countryside, and to a lesser extent canals, dams, and tanks (Yazdani 2017, 236). Tipu established state monopolies on the production of sandalwood and black pepper, provided agricultural loans, promoted irrigation with state funds, manipulated exchange rates, ordered the construction of gun foundries and saltpeter factories, and established a state-run mint (Stein 1985, 402). All of these represented a deeper encroachment of the state into the domestic economy. This 'military fiscalism' was extended beyond the core of the state to 'new tracts of the southern peninsula which had been conquered by him or his father' (Stein 1985, 401). Institutions set down by Tipu Sultan were by and large appropriated by the British EIC after it defeated Mysore in 1799. Mysore eventually collapsed, not from the inside, but from military defeat by the British EIC. Gilady and MacKay (2015) note that Mysore's shift to military fiscalism and conventional warfighting tactics may have tipped the military advantage in favor of the British, who had difficulty combating Mysore's earlier guerilla tactics. Extraction had its limits, though, determined largely by the 'ease with which these rulers [i.e. the local *poligars*] could be coerced' (as cited in Yazdani (2017, 139)). Transfer-based relations still characterized bargains with the more powerful landlords, some of whom waged an insurgency against Tipu Sultan and collaborated with the British (i.e. defected to a locally stronger imperial power).

The tenures of Ali and Sultan were also periods of intense military competition with the Maratha Confederacy and Nizam (Hyderabad) to the north and the EIC to the south and east. This competition is thought to have prompted Tipu's administrative reforms by increasing demand for reliable revenue extraction (Stein 1985). Mysore also expanded under Tipu Sultan, bringing at least seven additional kingdoms under his suzerainty although he was forced to cede half of Mysore to the EIC in 1792 (Yazdani 2018). It is consistent with our model that competition would produce centralization in a high-density system, but it is difficult to say whether this occurred because of the existing 'demand'-based mechanism cited by Stein (1985) or because the bargaining hand of the center is strengthened by competition and high-density systems generate preferences for extraction-based strategies (our mechanism). The fact that competition was not associated with centralization in a low-density system (Oyo), but was in a higher density system (Mysore) is suggestive that our mechanism better explains the data. If competition increases the demand for resources in general, then it should stimulate centralization in low-

and high-density systems. Scholars also point out that while Mysore's transition to direct extraction accelerated under Tipu Sultan, the displacement of the *poligars* (high-caste tax farmers) commenced during the reign of Chikka Deva Wodeyar (1645–1704) and continued under Haidar Ali, suggesting a more gradual process that coincides with economic development in South India during this period (Subrahmanyam 1989; Yazdani 2017, 71, 97). Before Haidar Ali came to power in 1761, the intermediary class of tax farmers had already been removed in the economically strong and geographically central districts of Mysore, Madya, and parts of Bangalore (Saki 1998, 370). Moreover, the increased revenues demanded of polities within the Mysore kingdom also reflected the increasing ability of Mysore to wage war with the infusion of European weapons, infantry tactics, and officers. Again, this decrease in the ability of polities to resist the state (i.e. p_v) should result in the center demanding a higher proportion of resources as extraction.

Generally, the pattern observed in Mysore is what we would expect as interaction capacity increases – the center taking more direct control of revenue extraction as the costs of doing so decline. The pattern also fits the general picture of increased competition and increased centralization in high-density systems. As in West Africa, Mysore is not an isolated case. Travanacore, for example, was another precolonial South Indian state with a highly centralized military apparatus and centralized revenue extraction (Ramusack 2004, 38).

Conclusions

Recent scholarship in international relations has seen a turn toward the conceptualization of political order in non-Western and pre-modern regions of the world. That turn has included a vocabulary of terms such as suzerainty, interaction capacity, as well as a set of older terms such as state formation and empire. We contribute to that turn with a game-theoretic model of political order, one that can be applied to diverse regions across time and space, and one that clarifies the relationship between different forms of political order (system structure) and system-level factors such as interaction capacity and the threat of war.

Our framework conceptualizes sovereign bargains between imperial and peripheral states as variations on two dimensions – whether the state retains external sovereignty, and whether resources are extracted from the periphery through transfers or direct extraction. We have formalized the risks and benefits implied by these arrangements and explored how rising interaction capacity and international competition shape the utility of these configurations. Our model highlights the importance of interaction capacity in driving the transition from transfer-based bargains to extraction-based arrangements. Competition plays a different role: the main effect is expanding frontiers by weakening the bargaining hand of autonomous polities. Competition may increase centralization but any effects in our model are limited to high-density systems where imperial polities already have preferences for direct extraction and sovereignty is valuable. Our case studies point to the *plausibility* of these propositions. The Oyo Empire was a vast, decentralized kingdom in a low-density environment that failed to centralize under competition. Meanwhile, in the higher density context of South India, Mysore was able to penetrate deep into society and directly extract military and economic resources.

Our findings suggest an important caveat to the pure 'war makes states' story. War may only make (centralized) states where leaders already have preferences for more direct extraction that arise from lower costs of extraction, which international competition then allows them to realize. Economic topography in much of the pre-industrial world was such that making 'states' simply was not worth it for most leaders, and as much as these leaders may have wanted more tax, it was too costly and risky to extract. This helps to make sense of the fact that war made states in a very particular region in a particular period of time – early modern and industrial Europe – and outside of this period, war generally did not generate more penetrative states. War may have made bigger empires as peripheral units banded together for collective defense, but rarely did this seem to result in the kinds of heavy-taxing, infrastructurally strong states that emerged in Europe. Our story is also consistent with recent empirical research suggesting that pre-colonial warfare did not contribute to bureaucratically strong 'common interest' states in Africa (Osafo-Kwaako and Robinson 2013; Dincecco *et al.* 2019), while it did in Asia and Europe.

An important question is how the model in this paper applies to evolutionary theories of institutional selection (Waltz 1979; Spruyt 1994; Phillips and Sharman 2015). Such theories assume a quasi-random distribution of political forms that then compete and converge on efficient models. More intense competition leads to faster convergence as inefficient forms are selected out. Our model could begin with a random distribution of political bargains where states extract resources and compete with each other over time. However, it highlights a powerful internal and fairly constant logic of competition that pushes states to find efficient institutional arrangements to extract resources, given the constraints in their environments. As we discussed above, given this internal competitive logic, the question becomes why states have not already converged on the most efficient forms of resource extraction in a given environment before international competition becomes intense. It could be that changes to economic conditions or technological conditions make existing arrangements less efficient without the knowledge of state leaders and the threat of war with a new, large, and powerful state is a trigger to experiment with different forms, but here it is the environmental changes driving institutional developments, not competition. Absent underlying changes in environmental conditions that make other institutions more efficient, the internal logic of competition should have driven state leaders to already have adopted the most efficient extraction methods, and if they cannot compete, they will not survive. In contrast to existing evolutionary theory, we would predict that states converge on similar political forms in low and high competition systems, even systems with no history, or a limited history of contact with each other.

There are a number of potentially fruitful extensions to the model. We conceptualized interaction capacity in terms of population density and material transportation and communication technologies. However, other factors may increase the size of D – natural resources are one example – and social developments such as nationalism or 'administrative technologies' may render more direct forms of rule more or less costly d (Kaufman 1997ed; Go 2008; Nedal and Nexon 2019). The model presented here may be used to develop pathways that link such key variables to systems change. In addition, our model is dyadic and static but

international systems are composed of multiple polities contracting in a complex strategic environment over long periods. We hope to expand this model by incorporating multiple actors, especially to explore the conditions under which heteronomous international systems may rise and fall. Doing so will introduce additional strategic dilemmas, especially commitment problems as actors bargain over factors that themselves affect the probability of victory. What we have attempted to do here is provide a foundation from which future work can move into some of these areas.

Finally, this paper is part of a broader *empirical* project that expands the quantitative study of historical state systems beyond Europe by identifying and classifying states that are elided by state-system registers such as the Correlates of War (Sarkees and Wayman 2010; Griffiths and Butcher 2013). New data sources pushing further back in time and beyond the European core of states during the 19th century (Griffiths and Butcher 2013; Knutsen *et al.* 2019) mean general theoretical models of international systems (including our own) can be subjected to empirical tests in spatial and temporal domains that have not been as well-studied at the European experience. We look forward to this exciting exchange between new theory and data in the study of international systems.

References

Acharya, Avidit, and Alexander Lee. 2014. "Global International Relations (IR) and Regional Worlds. A New Agenda for International Studies." *International Studies Quarterly* 58 (4): 647–59.

Adegbulu, Femi. 2011. "Pre-Colonial West African Diplomacy: It's Nature and Impact." *The Journal of International Social Research*, 4 (18): 13.

Adeleye, Rowland A. 1971. *Power and Diplomacy in Northern Nigeria 1804–1906: The Sokoto Caliphate and Its Enemies*. London, UK: Longman.

Ajayi, Jacob Festus Adeniyi. 1989. *Africa in the Nineteenth Century until the 1880s*. California, CA: UNESCO.

Akinjogbin, Isaac Adeagbo. 1966. "The Oyo Empire in the 18th Century: A Reassessment." *Journal of the Historical Society of Nigeria* 3 (3): 449–60.

Asiwaju, Anthony Ijaola. 1989. "Dahomey, Yorubaland, Borgu and Benin in the Nineteenth Century." In *General History of Africa, VI, Africa in the Nineteenth Century Until the 1880s*, edited by Jacob Festus Adeniyi Ajayi, 699–723. California, CA: UNESCO.

Barua, Pradeep. 2005. *The State at War in South Asia*. Nebraska, NE: University of Nebraska Press.

Besley, Tim, and Marta Reynal-Querol. 2014. "The Legacy of Historical Conflict: Evidence From Africa." *American Political Science Review* 108 (02): 319–36.

Branch, Jordan. 2014. *The Cartographic State: Maps, Territory, and the Origins of Sovereignty*. Cambridge, UK: Cambridge University Press.

Bremer, Stuart, and Faten Ghosn. 2003. "Defining States: Reconsiderations and Recommendations." *Conflict Management and Peace Science*, 20 (1): 21–41.

Bull, Hedley, and Adam Watson. 1984. *The Expansion of International Society*. Oxford: Clarendon Press.

Burbank, Jane, and Frederick Cooper. 2010. *Empires in World History: Power and the Politics of Difference*. Princeton, NJ: Princeton University Press.

Butcher, Charles, and Ryan Griffiths. 2015. "Alternative International Systems? System Structure and Violent Conflict in 19th Century West Africa, Southeast Asia, and South Asia." *Review of International Studies* 41 (4): 715–37.

Butcher, Charles, and Ryan Griffiths. 2017. "Between Eurocentrism and Babel: A Framework for the Analysis of States, State Systems, and International Orders." *International Studies Quarterly* 61 (2): 328–36.

Buzan, Barry, Charles Jones, and Richard Little. 1993. *The Logic of Anarchy: Neorealism to Structural Realism*. New York, NY: Columbia University Press, reprint edition.

Buzan, Barry, and Richard Little 2000. *International Systems in World History: Remaking the Study of International Relations*. Oxford, UK: Oxford University Press.

Centeno, Miguel. 2003. *War and the Nation-State in Latin America*. University Park, PA: Penn State University Press.

Clapham, Christopher. 1996. *Africa and the International System: The Politics of State Survival*. Cambridge, UK: Cambridge University Press.

Colgan, Jeff D. 2013. "Domestic Revolutionary Leaders and International Conflict." *World Politics* 65 (4): 656–90.

Cooley, Alexander. 2005. *Logics of Hierarchy: The Organization of Empires, States, and Military Occupations*. Ithaca, NY: Cornell University Press.

Cooley, Alexander, and Hendrik Spruyt. 2009. *Contracting States: Sovereign Transfers in International Relations*. Princeton, NJ: Princeton University Press.

Deudney, Daniel. 2007. *Bounding Power: Republican Security Theory from the Polis to the Global Village*. Princeton, NJ: University Press.

Deutsch, Karl Wolfgang. 2015. *Political Community and the North American Area*. Princeton, NJ: Princeton University Press.

Dillon-Savage, Jesse. 2019. *Patrons, Proxies, and International Competition: Political Survival, the Surrender of Sovereignty, and Informal Hierarchy*. Cambridge, UK: Cambridge University Press.

Dincecco, Mark. 2009. "Fiscal Centralization, Limited Government, and Public Revenues in Europe, 1650–1913." *The Journal of Economic History*, 69 (1): 48–103.

Dincecco, Mark, James Fenske, and Massimiliano Gaetano Onorato. 2019. "Is Africa Different? Historical Conflict and State Development." *Economic History of Developing Regions* 34 (2): 209–50.

Donnelly, Jack. 2012. "The Differentiation of International Societies: An Approach to Structural International Theory." *European Journal of International Relations* 18 (1): 151–76.

Donnelly, J. 2015. "The Discourse of Anarchy in IR." *International Theory* 7 (3): 393–425.

Doyle, M. W. 1986. *Empires*. New York, NY: Cornell University Press.

Dunne, Timothy, and Christian Reus-Smit. 2017. *The Globalization of International Society*. Oxford, UK: Oxford University Press.

Ejiogu, EC. 2011. "State Building in the Niger Basin in the Common Era and Beyond, 1000–Mid 1800s: The Case of Yorubaland." *Journal of Asian and African Studies* 46 (6): 593–614.

Fazal, Tanisha M., and Ryan D. Griffiths. 2014. "Membership Has Its Privileges: The Changing Benefits of Statehood." *International Studies Review* 16 (1): 79–106.

Fearon, James D. 1995. "Rationalist Explanations for War." *International Organization* 49 (3): 379–414.

Fenske, James, and Namrata Kala. 2017. "1807: Economic Shocks, Conflict and the Slave Trade." *Journal of Development Economics* 126: 66–76.

Gerring, John, Daniel Ziblatt, Johan Van Gorp, and Julian Arevalo. 2011. "An Institutional Theory of Direct and Indirect Rule." *World Politics* 63 (3): 377–433.

Gilady, Lilach, and Joseph MacKay. 2015. "Bringing the Insurgents Back In: Early Wars in British India." *Terrorism and Political Violence* 27 (5): 797–817.

Go, Julian. 2008. "Global Fields and Imperial Forms: Field Theory and the British and American Empires*." *Sociological Theory* 26 (3): 201–29.

Go, Julian. 2011. *Patterns of Empire: The British and American Empires, 1688 to the Present*. Cambridge, UK: Cambridge University Press.

Gopal, Hatti. 1971. *Tipu Sultan's Mysore: An Economic Study*. Bombay, IN: Popular Prakashan.

Griffiths, Ryan D., and Charles R. Butcher. 2013. "Introducing the International System(s) Dataset (ISD), 1816–2011." *International Interactions* 39 (5): 748–68.

Habib, Irfan. 2002. *Confronting Colonialism: Resistance and Modernization Under Haidar Ali & Tipu Sultan*. Melbourne, AUS: Anthem Press.

Hechter, Michael. 2013. *Alien Rule*. Cambridge, UK: Cambridge University Press.

Herbst, Jeffrey. 2000. *States and Power in Africa: Comparative Lessons in Authority and Control*. Princeton, NJ: Princeton University Press.

Hui, Victoria. 2005. *War and State Formation in Ancient China and Early Modern Europe*. Cambridge, UK: Cambridge University Press.

Jervis, Robert. 1978. "Cooperation Under the Security Dilemma." *World Politics* 30 (2): 167–214.

Kalyvas, Stathis N., and Laia Balcells. 2010. "International System and Technologies of Rebellion: How the End of the Cold War Shaped Internal Conflict." *American Political Science Review* 104 (3): 415–29.

Kang, David. 2010. *East Asia before the West: Five Centuries of Trade and Tribute*. New York, NY: Columbia University Press.

Kaufman, Stuart J. 1997. "The Fragmentation and Consolidation of International Systems." *International Organization* 51 (2): 173–208.

Knutsen, Carl Henrik, Jan Teorell, Tore Wig, Agnes Cornell, John Gerring, Haakon Gjerløw, Svend-Erik Skaaning, *et al.* 2019. "Introducing the Historical Varieties of Democracy Dataset: Political Institutions in the Long 19th Century." *Journal of Peace Research* 56 (3): 440–51.

Krasner, Stephen. 1999. *Sovereignty: Organized Hypocrisy*. Princeton, NJ: Princeton University Press.

Lake, David. 1996. "Anarchy, Hierarchy and the Variety of International Relations." *International Organization* 50 (1): 1–33.

Lake, David. 2009. *Hierarchy in International Relations*. New York, NY: Cornell University Press.

Law, Robin. 1977. *The Oyo Empire: The History of a Yoruba State C. 1600-C. 1836*. Oxford, UK: Clarendon Press.

Law, Robin. 1971. "The Constitutional Troubles of Ọyọ in the Eighteenth Century." *The Journal of African History* 12 (1): 25–44.

Levy, Jack S. 1982. "Historical Trends in Great Power War, 1495–1975." *International Studies Quarterly* 26 (2): 278–300.

MacKay, Joseph. 2018. "Rethinking Hierarchies in East Asian Historical IR." *Journal of Global Security Studies* 4(4):598–611.

Mattern, Janice Bially, and Ayşe Zarakol. 2016. "Hierarchies in World Politics." *International Organization* 70 (3): 623–54.

May, Timothy. 2013. *The Mongol Conquests in World History*. London, UK: Reaktion Books.

McCarty, Nolan, and Adam Meirowitz. 2007. *Political Game Theory: An Introduction*. Cambridge, UK: Cambridge University Press.

McConaughey, Meghan, Paul Musgrave, and Daniel H. Nexon. 2018. "Beyond Anarchy: Logics of Political Organization, Hierarchy, and International Structure." *International Theory* 10 (2): 181–218.

Morton-Williams, Peter. 1967. *West African Kingdoms in the Nineteenth Century*. London, UK: Routledge.

Nedal, Dani K., and Daniel H. Nexon. 2019. "Anarchy and Authority: International Structure, the Balance of Power, and Hierarchy." *Journal of Global Security Studies* 4 (2): 169–89.

Nexon, Daniel. 2009. *The Struggle for Power in Early Modern Europe: Religious Conflict, Dynastic Empires, and International Change*. Princeton, NJ: Princeton University Press.

Nexon, Daniel, and Thomas Wright. 2007. "What's at Stake in the American Empire Debate." *American Political Science Review* 101 (2): 253–71.

North, Douglass C. 1990. "A Transaction Cost Theory of Politics." *Journal of Theoretical Politics* 2 (4): 355–67.

Oliver, Roland, and Anthony Atmore. 2001. *Medieval Africa, 1250–1800*. Cambridge, UK: Cambridge University Press.

Organski, Abramo Fimo Kenneth. 1958. *World Politics*. New York, NY: Knopf.

Osafo-Kwaako, Philip, and James A. Robinson. 2013. "Political Centralization in pre-Colonial Africa." *Journal of Comparative Economics* 41 (1): 6–21.

Paz, Manuel Barcia. 2014. *West African Warfare in Bahia and Cuba: Soldier Slaves in the Atlantic World, 1807–1844*. Oxford, UK: Oxford University Press.

Perlin, Frank. 1983. "Proto-Industrialization and Pre-Colonial South Asia." *Past & Present* 98 (1): 30–95.

Person, Yves. 1989. "States and Peoples of Senegambia and Upper Guinea." In *Africa in the Nineteenth Century until the 1880s*, edited by J. F. A. Ajayi, 636–61. Paris, FR: UNESCO.

Phillips, Andrew. 2011. *War, Religion, and Empire: The Transformation of International Orders*. Cambridge, UK: Cambridge University Press.

Phillips, Andrew. 2017. Making Empires: Hierarchy, Conquest, and Customization. In Ayşe Zarakol (ed), *Hierarchies in World Politics*, Cambridge, UK: Cambridge University Press, pp. 43–65.

Phillips, Andrew, and Jason Sharman. 2015. *International Order in Diversity: War, Trade and Rule in the Indian Ocean*. Cambridge, UK: Cambridge University Press.

Philpott, Daniel. 2001. *Revolutions in Sovereignty: How Ideas Shaped Modern International Relations*. Princeton, NJ: Princeton University Press.

Ramusack, Barbara N. 2004. *The Indian Princes and Their States*. Cambridge, UK: Cambridge University Press.

Reiter, Dan. 2003. "Exploring the Bargaining Model of War." *Perspectives on Politics* 1 (1): 27–43.

Richards, John F. 1995. *The Mughal Empire*. Cambridge, UK: Cambridge University Press.

Ringmar, Erik. 2012. "Performing International Systems: Two East-Asian Alternatives to the Westphalian Order." *International Organization* 66 (1): 1–26.

Ruggie, John. 1998. *Constructing the World Polity*. New York, NY: Taylor and Francis Group.

Ruggie, John. 1993. "Territoriality and Beyond: Problematizing Modernity in International Relations." *International Organization* 47 (1): 139–74.

Saki. 1998. *Making History: Karnataka's People and Their Past. Stone Age to Mercantilism*. Vol. 1, Bangalore: Vimukthi Prakashana.

Sanders, James. 1979. "The Expansion of the Fante and the Emergence of Asante in the Eighteenth Century1." *The Journal of African History* 20 (3): 349–64.

Sarkees, Meredith, and Frank Wayman. 2010. *Resort to War: 1816–2007. Correlates of War*. Washington, DC: CQ Press.

Scott, James. 2010. *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia*. Haven, NJ: Yale University Press.

Smith, Robert Sydney. 1988. *Kingdoms of the Yoruba*. Madison, WI: University of Wisconsin Press.

Spruyt, Hendrik. 1994. *The Sovereign State and Its Competitors*. Princeton, NJ: Princeton University Press.

Stein, Burton. 1985. "State Formation and Economy Reconsidered." *Modern Asian Studies* 19 (3): 387–413.

Subrahmanyam, Sanjay. 1989. "Warfare and State Finance in Wodeyar Mysore, 1724–25: A Missionary Perspective." *The Indian Economic & Social History Review* 26 (2): 203–33.

Suzuki, Shogo, Yongjin Zhang, and Joel Quirk. 2013. *International Orders in the Early Modern World: Before the Rise of the West*. London, UK: Routledge.

Tilly, Charles. 1992. *Coercion, Capital, and European States, AD*. Hoboken, NJ: Wiley-Blackwell.

Turchin, Peter. 2009. "A Theory for Formation of Large Empires*." *Journal of Global History* 4 (2): 191–217.

Usman, Aribidesi A. 2000. "A View from the Periphery: Northern Yoruba Villages during the Old Oyo Empire, Nigeria." *Journal of Field Archaeology* 27 (1): 43–61.

van Evera, Stephen. 1998. Offense, Defense, and the Causes of War. *International Security*, 22 (4): 5–43.

Waltz, Kenneth. 1979. *Theory of International Politics*. Boston, MA: McGraw Hill.

Watson, Adam. 1992. *The Evolution of International Society: A Comparative Historical Analysis*. New York, NJ: Routledge.

Wilks, Ivor. 1989. *Asante in the Nineteenth Century: The Structure and Evolution of a Political Order*. Cambridge, UK: Cambridge University Press.

Yazdani, Kaveh. 2014. "Haidar 'Ali and Tipu Sultan: Mysore's Eighteenth-Century Rulers in Transition." *Itinerario (Leiden, Netherlands)* 38 (2): 101–20.

Yazdani, Kaveh. 2017. *India, Modernity and the Great Divergence: Mysore and Gujarat (17th to 19th C.)*. Leiden, ND: Brill.

Yazdani, Kaveh. 2018. "Foreign Relations and Semi-Modernization during the Reigns of Haidar 'Ali and Tipu Sultan." *British Journal of Middle Eastern Studies* 45 (3): 394–409.