

Building a New Imperial State: The Strategic Foundations of Separation of Powers in America

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Separation of powers existed in the British Empire of North America long before the U.S. Constitution of 1789, yet little is known about the strategic foundations of this institutional choice. In this article, I argue that separation of powers helps an imperial crown mitigate an agency problem with its colonial governor. Governors may extract more rents from colonial settlers than the imperial crown prefers. This lowers the Crown's rents and inhibits economic development by settlers. Separation of powers within colonies allows settlers to restrain the governor's rent extraction. If returns to settler investment are moderately high, this restraint is necessary for colonial economic development and ultimately benefits the Crown. Historical evidence from the American colonies and the first British Empire is consistent with the model. This article highlights the role of agency problems as a distinct factor in New World institutional development, and in a sovereign's incentives to create liberal institutions.

Separation of powers is one of the hallmarks of the U.S. federal and all state constitutions. It powerfully structures the political process, creating multiple veto points that make policy stable over time. It requires inclusion of multiple branches of government in political coalitions, which is one way to inhibit arbitrary and extractive political action. Yet almost no research in political economy or political science explores the origins of this celebrated political institution in the United States.

This article explores the strategic origins of separation of powers in the British Empire in North America. While American constitutional thought in the 1780s gave new rationales for separation of powers, the institution itself was not new: American experience with it stretched back several generations under English imperial rule (Wood 1969; Lutz 1988). To understand the origins of this institution in the United States, then, we must look to the imperial era.¹

I argue that the English Crown had the incentive to develop the institutional forerunners of separation of powers in the United States in the 17th and early 18th centuries. The Crown's incentive arose from its desire to find a reliable solution to a ubiquitous governance problem in New World empires: an agency problem with colonial governors. This agency problem arose from conflicting goals between the Crown and governor. Both the Crown and governor sought to extract rents from the colonial economy to their own benefit (Greene 1898; Wertenbaker 1914; Elliott

2007). While they shared an interest in a large economy, they had conflicting interests regarding its distribution. Yet a governor was necessary for legal claims of sovereignty, military security, and economic administration (MacMillan 2006; McCusker and Menard 1985). Given that ocean travel was slow, expensive, and risky, intervening to exert control was difficult for the Crown.² This engendered an agency problem.

In the following text, I develop a formal model of this agency problem. In this model, rent extraction by the governor threatens the rents available to the Crown in both a direct and indirect way. Directly, the governor can take rents that reduce the Crown's tax base. Indirectly, rent extraction might induce settlers to hold back on vulnerable investments in the colonial economy. The governor does not (intrinsically) internalize the costs of its rent extraction on the Crown (or settlers). The Crown, of course, can try to control the governor and limit its extraction, for example, by sacking the governor for excessive extraction or legislating in advance to take a large cut of the rents. But as I prove formally, the Crown's tools to control the governor have limited credibility, because colonial political turnover is disruptive to the economy.³ This gives the governor room to maneuver in extracting rents, which harms the Crown's interest.⁴

Another option for the Crown was to make colonial settler assemblies independent of the governor and endow them with the power of the purse in colonial finances. This was the essence of separation of powers in English North America (Greene 1898). The

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¹ This echoes Bryce (1888) and Wright (1933) and is elaborated in the next section.

² According to a classic study of English colonial governors, "Since the restraints imposed upon the governor by the home government [i.e., Crown] are seen to have been practically inadequate, more effective checks must be sought within the province" (Greene 1898, 198).

³ Other tools discussed below (e.g. selling offices) can redistribute rents between the governor and Crown but do not restrain rent extraction that undermines settler investment.

⁴ This agency problem relates to, but is distinct from, existing arguments in the formal literature on nondemocratic politics (see Gehlbach, Sonin, and Svobik (2016) for the state of the art). In this article, in essence, a dictator is worried that its agent steals too much from the people, so it creates liberal institutions to restrain the agent—even if this partly restrains the dictator himself.

model shows that this has countervailing effects on the Crown. Directly, empowering settlers to control the purse strings would not help the Crown, because they would keep taxes as low as possible while still allowing the administration to function. But indirectly, empowering the assembly can increase the Crown's wealth: separation of powers provides stronger protections for colonial settlers' investments in colonial development so that they are more likely to make those investments.⁵ This occurs because, by restraining the governor's rent extraction, separation of powers alleviates the hold up problem faced by settlers deciding to invest. In this way, separation of powers harnesses a common interest between the settlers and the Crown to restrain the governor, allowing control of the governor at low cost to the Crown.⁶

The main result (Proposition 5) is that if returns to settler investment are moderately (but not very) high, separation of powers leads to settler investment that would not occur otherwise, so the Crown has an incentive to support it in these cases. The Crown's inability to completely control the governor by itself leads to excessive rent extraction from settlers. Under moderate returns to investment, settlers would avoid mutually beneficial investment as a result. Separation of powers alleviates this problem by turning control over to settlers *ex ante*. Thus, the logic echoes previous work in which a commitment problem creates an inefficiency, and adopting a liberal institution can resolve it (e.g., North and Weingast 1989; Acemoglu and Robinson 2000; Boix 2003). The key differences in this paper from prior literature are (i) here the ruler uses a liberal institution to restrain its agent, not (just) itself,⁷ (ii) I consider an institution not previously analyzed in this literature.

Though largely neglected in American politics and political economy,⁸ the origins and development of separation of powers are important for two reasons. First, separation of powers is an essential feature of the American polity. To understand why the United States looks as it does, we must understand the origins of this institution. Second, separation of powers represented a relatively inclusive institution in English North America. Its predecessors concentrated immense political authority in colonial governors. Therefore, the

development of separation of powers in English North America can shed light on conditions for the creation of inclusive institutions (cf. Acemoglu and Robinson 2013).

This article also makes a larger point about the strategic, *political* foundations of institutions in early modern empires of the New World. No widely known theory of these institutions emphasizes strategic choice by imperial crowns. A seminal empirical account of New World institutions correlates them with colonial factor endowments (Sokoloff and Engerman 2000). Another argument (Acemoglu, Johnson, and Robinson 2001) points to European settler mortality as a determinant of colonial institutions. In a third direction, numerous scholars have also contended that culture, either of the imperial colonizers or the pre-contact indigenes, is responsible for determining institutional development.⁹

This article represents a qualitatively different strain of argument: that strategic problems of governance powerfully affected New World political institutions. Because of the need for strong governors and the high cost of royal intervention, all early modern empires faced significant agency problems with their governors in the New World.¹⁰ We should expect European crowns to have designed imperial institutions to mitigate those agency problems, because this would increase the value of the empire to the Crown. Only the English developed separation of powers with representative assemblies, and only in part of their New World empire, because the resource endowments generated a specific agency problem in these areas that was mitigated by empowering settlers with liberal institutions.¹¹ Thus, in one sense, this article begins to provide endogenous, political foundations for the classic analysis of Engerman and Sokoloff.¹² This argument pushes away from American exceptionalism, inasmuch as precursors of American institutions result as a special case of a more general agency problem faced by European crowns, rather than a singular act of rational design by the framers of the U.S. Constitution.

The rest of this article is organized as follows. The next section briefly reviews the background history of separation of powers in English North America. Then I present an economic model of settler investment, a crucial requirement for economic success in English North America. Following this, I present an agency

⁵ Cf. North and Weingast (1989); Stasavage (2003); and Cox (2016) on English Crown self-restraint and investor protection. Here, investor protection comes not from allowing investors to restrain the Crown itself (in equilibrium), but rather its imperfectly controlled agent.

⁶ The seminal agency model of separation of powers is Persson, Roland, and Tabellini (1997). In their paper, citizens empower one agent to set the budget and another to spend it, then can retain or fire either agent. The present model is a slightly different case where citizens themselves set the budget, and two agents jointly determine spending.

⁷ Indeed, in equilibrium in my model, *only* the agent's (here, governor's) rent extraction is restrained by separation of powers.

⁸ Many scholars consider the effects of separation of powers, but not its origins. In American politics, even analyses of the Revolutionary period are rare (Hammond and Miller 1987; Grofman and Wittman 1989; Jillson and Wilson 1994; Dougherty 2000), and none consider pre-Revolutionary political development or separation of powers.

⁹ Creative arguments also combine multiple factors (e.g., Mahoney (2010) on the match between culture and environment).

¹⁰ Cf. Gerring et al. (2011) and Padró i Miquel and Yared (2012) on the general problem of indirect control in governance. A similar problem, but different information conditions and approach by the dictator, is covered by Sng (2014) in the context of late imperial China.

¹¹ Historical observations on this point are considered further below after the models are analyzed.

¹² It also provides a new answer to a question posed by North (1990): Why did England develop liberal institutions resembling Parliament in North America but not in its other colonies? However, I do not follow North's contention that England exported Parliament to America. Rather, the English Crown made American assemblies stronger relative to the imperial governor than it wanted Parliament to be relative to itself.

model of imperial hierarchy and rent extraction, highlighting the Crown's difficulties in controlling the governor. Then I model separation of powers, and identify cases in which it increases the Crown's rents. This is followed by discussion of institutional development in the English New World in light of the model, with brief comparisons to the Spanish and French empires.

HISTORICAL BACKGROUND

Separation of powers in this article means the regularized participation in policy making by both a governor and an assembly, under conditions such that the governor and assembly have independent power bases. Most naturally in the present context, the power base of the governor is the Crown of England (before 1707) or Britain (after 1707). The power base of the assembly in separation of powers is some distinct subset of the colonial population (e.g., a planter elite, all white male property owners). Separation of powers does not obtain in this definition when the governor has tools to force a nominally elective assembly into submission to the governor's plans (e.g., control over patronage appointments upon which individual assembly members depend). Separation of powers requires independence of the institutions of government from one another.¹³

The concept of separation of powers available to the framers of the U.S. federal and state constitutions was not a novel abstraction from the minds of theoreticians such as Locke, Montesquieu, and Blackstone. In fact, separation of powers already existed in the English imperial constitution long before the 1780s (Wood 1969; Lutz 1988). Without denigrating the original theoretical arguments in *The Federalist* (etc.), one can suspect that this colonial experience affected the framers of the U.S. Constitution. Bryce (1888) put it beyond dispute: "From their colonial experience, the men of 1787 drew [the] conclusion...that the vesting of legislative and executive powers in different hands was the normal and natural feature of a free government...[and] that in order to check the head of state it was necessary...to destroy his opportunities of influencing the legislature" (26). And another classic study: "The Framers of the first American constitutions were impressed by the separation of powers theory only because their own experience...confirmed its wisdom" (Wright 1933).

Mixed government came to America with the English. Starting with the royally approved corporate charters of Virginia (1606, 1609, 1612), the proprietor or Crown-appointed colonial governor was always required at least to seek advice from some sort of council.

¹³ In 17th-century thought, separation of powers required mutual independence of only the legislative and executive parts of government; more recent understanding requires mutual independence of the judicial part as well: "The earliest versions of the doctrine were, in fact, based on a twofold division of government...but since the mid 18th century the threefold division has been generally accepted as the basic necessity" (Vile 1967, 16). In Vile's formulation, mutual independence of distinct branches of government essential to the "pure doctrine" of separation of powers, though the pure doctrine is always alloyed with some other doctrine—checks and balances, mixed government, etc.—in practice.

However, mixed government is different from separation of powers (Vile 1967). Some charters specifically did not provide for the council to represent the people; rather, council members could be selected on recommendation by the governor (e.g., Virginia until 1619, New York in 1664). Moreover, representative assemblies were not immune to domination by the governor through selection, bribery, and prorogation, such that assembly independence was compromised (e.g., Virginia in the 1670s).

Institutional development in English North America occurred within colonial (i.e., within colonies) and imperial (i.e., between colonies and the metropole) spheres (Greene 1986). Institutional forms in the 17th century derived legal authority from the assent of the Crown (Keith 1930), but strategic interaction by key actors in these spheres—the Crown, governor, and settlers—determined their structure (Greene 1986). These institutions followed complex paths of development with numerous influences and no single, time-consistent royal plan (Greene 1963). Nevertheless, the Crown often acted as though colonial and imperial political structure would affect the value of the colonies to the Crown and attempted to restructure colonial and imperial institutions to suit its interests (Rainbolt 1967; Stanwood 2011). During the 17th and 18th centuries, colonial assemblies developed the independence necessary for separation of powers in a gradual process (Greene 1963), punctuated by important Crown support (Taylor 2002).¹⁴

These institutions were not replicas of those found in the metropole itself (Lutz 1988). To be sure, there is a clear homology between assemblies in English colonies and the House of Commons in England. However, the colonial assemblies, their eventual independence from colonial governors, and the resulting separation of powers were not merely imported from England or created because it was "the English way." The English Crown took steps in support of assemblies in America that it did not take contemporaneously with Parliament in England (discussed further below after the model is presented). For example, Charles II granted several American colonial assemblies the right to schedule their own meetings, while opposing the Triennial Act guaranteeing the English Parliament the right to meet every 3 years. Some North American assemblies held powers over disbursement of funds and planning of military excursions that Parliament never claimed (Labaree 1930).

Beyond direct assertions of control over internal colonial structure, the English Crown supported the independence of colonial assemblies, simply by refusing to allow challenges to them. This fell under the policy of "wise and salutary neglect" of the colonies by the metropole, a policy at its high water mark under the Prime Ministers of the early Hanover kings (ca. 1721–1754). The policy implied more than simple disregard: the king-in-council passively protected colonial

¹⁴ This article focuses on the latter aspect, Crown support, but gradual evolution of colonial assembly powers was at least equally important and should be interesting to explore in future research.

assemblies from metropolitan incursions. For example, on three separate occasions between 1734 and 1749, the king's Privy Council declined to support bills in Parliament asserting the supremacy of Crown instructions over colonial law, effectively vetoing the bills (Greene 1963).

All of this implies that to understand the genesis of separation of powers in the United States, it is not sufficient to examine the framing of the U.S. federal or state constitutions of the 1780s, nor to examine the domestic English constitution of the 17th century. Instead, it is necessary to examine the design of institutions in the British Empire (Bryce 1888; Wright 1933; Lutz 1988).

A MODEL OF THE COLONIAL POLITICAL ECONOMY

This section describes a baseline model of a colony's political-economic process. It is designed to capture endogenous economic development of the colony driven by settlers—a salient condition in English North America in the 17th century.¹⁵ This baseline model is then embedded in two different models of the political process: one with hierarchical control among imperial officials, and one with separation of powers within the colony.

There are three players in the model: the Crown C , the governor G , and settlers S . All players are infinitely lived with a common stationary discount factor δ , and interested in maximizing their own (and only their own) discounted stream of economic payoffs.¹⁶

The economy recurs in an infinite sequence of identical periods indexed by t . Colonial settlement is such that without a governor in the long run, the Crown has no legal claim on economic output at all and would probably lose its colony to some other European crown (MacMillan 2006). Thus, I assume that there is a governor in office at the start of every period. The colony's output in a given such period t is V^t . The minimal value of V^t is 1. S can make an investment in the colony, $e^t \in \{0, 1\}$. High-value investment in the colony, $e^t = 1$, adds V_H to the colony's period t output. Low-value investment in the colony, $e^t = 0$, is valued at V_L and captured entirely by settlers. It does not add to the colony's output and cannot be expropriated by officials. Assume $0 < V_L < V_H$. Either investment fully depreciates after each period.

¹⁵ It is therefore not designed to capture economic development by resource extraction from forced labor or trade with Native Americans, or empty claims of sovereignty without imperial agents in place. All of these conditions prevailed in New World empires of England, Spain, and France at various other places and times. These differences, which account for some of the institutional variation over New World empires, will be further explored in historical discussion below.

¹⁶ Class and ideological conflicts within the settlers are suppressed (e.g., between farmers of different products, farmers and merchants, immigrants and native born), such that the analysis considers their common interests with respect to G and C .

The colony's output in period t can thus be compactly expressed as

$$V^t = 1 + e^t V_H. \quad (1)$$

With the high-value investment ($e^t = 1$), the economy's output is $1 + V_H$. With the low-value investment ($e^t = 0$), the economy's output is 1.

Let α_i^t denote a share of V^t taken by player i in period t (these shares are endogenously determined in equilibrium below). Then period t payoffs are

$$u_S^t = \alpha_S^t V^t + (1 - e^t) V_L,$$

$$u_G^t = \alpha_G^t V^t,$$

$$u_C^t = \alpha_C^t V^t.$$

Thus, settlers can generate a larger economy V^t in a given period through high investment in that period, but some of the value may be captured by imperial officials—the governor and the Crown. So, if $e = 1$, settlers take $\alpha_S(1 + V_H)$. High investment in synergistic activities with other economic agents, traders, shippers, and so on, builds more value, but by the same token, it is observable by many actors and so more easily within reach of the state. It can be extracted by officials and damaged or lost in the event of political disruptions or civil unrest.

On the other hand, settlers can generate a safer return for themselves through low investment in the colony: when $e = 0$, settlers take $\alpha_S + V_L$. The settlers can lose only what they put within reach of the government. Investments outside of the economy are also more easily placed beyond the reach of the state and its agents: they are harder to tax, cannot be captured by an absconding governor, and are not destroyed or forfeited to the Crown in rebellion.¹⁷ For example, small-scale agriculture on the frontier not only generates less value than cash crops for international trade but also does not produce surplus attainable by revenue collectors.¹⁸

¹⁷ V_H and V_L are similar to the “market” and “home” production technologies in Acemoglu and Robinson (2000). See Mayshar et al. (2011) for the effect of transparency of output on government emergence and organization.

¹⁸ This option was readily available to able-bodied free colonists, and many took it: “[M]any small and middling farmers, worried about their prospects, could and did move to the frontiers—the Appalachians and mountain valleys—where high levels of land ownership could be found...[W]hites either squatted on the land, or banded together to purchase it and extinguish the Indians' title” (Kulikoff 2000, 127). This was the province of the middle class, not the poor: “Many in the growing class of poor had too few assets even to move to a frontier, where greater opportunities beckoned” (Kulikoff 2000, 127). It was dangerous because it raised the likelihood of Indian conflicts and instability in crop harvest (Hinderaker and Mancall 2003), but it was not necessarily less attractive than subsistence agriculture in the grim malaise of lower-middle class England: environmental and interethnic stresses may have been less intense, but labor-to-land ratios were much less favorable.

The focus on settler investment decisions reflects that white English settlers came mostly voluntarily,¹⁹ and it had to be worth their while to labor for the development of the colony.²⁰ This participation constraint was apparent to colonial and imperial elites at the time; for example, a British minister counseled a royal colonial governor, “In the Plantations, the Government should be as Easy and Mild as possible to invite people to Settle under it.”²¹

POLITICAL PROCESS: HIERARCHICAL AGENCY

The political process modeled in this section is designed to highlight an agency problem between the Crown and imperial governors. It is a moral hazard model of political agency. It modifies standard models (Barro 1973; Ferejohn 1986) by introducing successive rent extraction by two actors, of a form that appears not to be present in the political agency literature to date. The first actor (governor) extracts rents from the entire real economy, and the second (Crown) extracts rents from whatever is left after the governor’s cut. The first can be dismissed by the second if its rents are not high enough, and they both can be punished by the last mover (settlers, via rebellion²²) if its total rents are not high enough.²³

Formally, the stage game in period t , which is repeated infinitely many times, consists of five steps. This structure, all parameters, and all utility functions are common knowledge.

1. S chooses investment $e^t \in \{0, 1\}$, which determines V^t as per Equation (1).
2. G extracts a share $x^t \in [0, 1]$ of V^t .
3. C observes $(1 - x^t)V^t$ and chooses whether to retain or sack G .²⁴
 - If C retains G ($r_c^t = 1$), then play moves to step 4.

¹⁹ English/British authorities did occasionally round up felons and/or impoverished persons in England and ship them to various colonies, especially in the South; see Taylor (2002).

²⁰ This also squares with the contention of Acemoglu, Johnson, and Robinson (2001) that settler habitation powerfully affected institutional structure. Here it is not so much by simply importing “good” institutions from the mother country; it is by forcing Crown consideration of incentive constraints to generate the rents the Crown wished to extract.

²¹ Secretary of Lords Justice Delafaye to Governor Nicholson, Jan. 26, 1722, in Francis Nicholson Papers on South Carolina, 1720–1727, quoted in Greene (1963).

²² See also Acemoglu and Robinson (2000) and Boix (2003), where the possibility of rebellion influences institutional choices further up the game tree.

²³ The model focuses entirely on the incentive effects of sacking G , not the selection aspects of picking a “high-quality” or “loyal” G . One can assume selection processes have already occurred, and the sitting governor’s potential replacement, selected by the same process, would be of equal “quality” in expectation.

²⁴ Though C observes $(1 - x^t)V^t$, under perfect information it can infer x^t . Imperfect information (e.g., uncertainty about investment returns) would prevent this inference. However, as will be shown, C already faces an acute accountability problem even with perfect information; imperfect information can only make it worse.

- If C sacks G ($r_c^t = 0$), the stage is over, S and C move to stage $t + 1$, G is replaced with an identical G in $t + 1$, and period t payoffs are

$$* \quad u_G^t = \sigma_G V^t,$$

$$* \quad u_C^t = \sigma_C V^t,$$

$$* \quad u_S^t = \sigma_S V^t + (1 - e^t)V_L.$$

4. C extracts a share y^t of $(1 - x^t)V^t$.

5. S observes $(1 - x^t)(1 - y^t)V^t$ and remains loyal or rebels.

- If S remains loyal ($r_s^t = 1$), the stage is over, all players continue to period $t + 1$, and period t payoffs are

$$* \quad u_G^t = x^t V^t,$$

$$* \quad u_C^t = y^t(1 - x^t)V^t,$$

$$* \quad u_S^t = (1 - x^t)(1 - y^t)V^t + (1 - e^t)V_L.$$

- If S rebels ($r_s^t = 0$), the stage is over, all players continue to period $t + 1$, and period t payoffs are

$$* \quad u_G^t = \rho_G V^t,$$

$$* \quad u_C^t = \rho_C V^t - M,$$

$$* \quad u_S^t = \rho_S V^t + (1 - e^t)V_L.$$

The endogenous choices (lowercase letters) are e^t, x^t, y^t, r_c^t , and r_s^t . The exogenous parameters (Greek or capital letters) are V_L, V_H, δ (explained above), M, σ_i , and ρ_i (explained below). The stage game is stationary, with identical parameters recurring every period.

Each player i ’s total payoff for the repeated game is the discounted sum of stage game payoffs. As is standard in stationary political agency models (e.g., Ferejohn 1986), I focus on stationary subgame perfect equilibrium (stationary SPE).²⁵ These are based on simple retrospective judgments and do not rely on complicated rules or multigenerational commitments. Given stationarity, the time superscript t on endogenous variables will generally be suppressed below; for example, $V = 1 + (1 - e)V_H$ simply represents (expropriable) economic output in a given period with investment $e \in \{0, 1\}$.

In the rest of this section, I offer substantive motivation and justification for several facets of the model’s structure, then I consider stationary SPE and key comparative statics, and finally I consider alternative model structures and the robustness of the results to them.

²⁵ Stationary SPE is SPE in stationary strategies. A stationary strategy entails identical play in identical subgames, so $\{e^t, x^t(e), r_c^t(e, x), y^t(e, x, r_c), r_s^t(e, x, r_c, y)\}$, where z^t denotes a decision rule and z its current period value, are constant for all t . Since the stage game is identical every period in this model, stationary SPE is equivalent to Markov perfect equilibrium, a standard concept in political economy models with stochastic games (e.g., Acemoglu and Robinson 2000).

Substantive Motivation

Stage Game Sequence. The stage game allows the governor to choose his tax rate before the Crown.²⁶ This allows the governor to determine the Crown's tax base, $(1 - x)V$. The Crown could attempt to set its tax rate y in advance by statute, but its tax base will then determine its revenues, $y(1 - x)V$.

Any extraction by governors from the economy's productive capacity works as a reduction in the Crown's tax base in this way. Governors had numerous channels for such extraction from the colonial economy, through tax rates and beyond (McCusker and Menard 1985; Rabushka 2010)—for example, by preferential access the largest and best tracts of land (even abrogating existing land titles in some cases), control of colonial credit, fees for administrative services, management of the lucrative black market international trade,²⁷ regulation of Indian trade, and so on. If the governor takes the most productive parcels of land for his own use and evades imperial taxes by smuggling his own output to foreign shippers, the governor's self-dealing shrinks the base to which the Crown's tax rate y applies, as the model reflects. Colonial taxes themselves also worked in this way, due to sequential points of collection (Rabushka 2010): if a share x is taken from the colonial harvest for internal management,²⁸ then at most $(1 - x)$ is left to ship to England, where import duties were collected upon arrival.

I return to the foundations of the stage game sequence later in this section, after the analysis is complete.

Sacking and the Role of the Governor. If the Crown is not satisfied with $(1 - x)V$ in a given period, it can sack the governor (step 3 of the stage game). Governors were understood as agents of the Crown, particularly in the royal colonies (Keith 1930), but eventually in all of them (Wood 1969). Sacking or recalling the governor was the Crown's principal remedy for unsatisfactory performance (Greene 1898).²⁹ Sacking G immediately ends the period—and G 's political career. S and C move on to period $t + 1$, but G is replaced in period $t + 1$ by an *ex ante* identical replacement, coincidentally

also named G . Period t payoffs are $u_i^t = \sigma_i V^t$ for $i \in G$, C , and $u_S^t = \sigma_S V^t + (1 - e^t)V_L$.

The shares $\sigma_i \in (0, 1)$ are exogenous parameters.³⁰ I assume that $\sum_i \sigma_i < 1$, so sacking the governor causes short term economic disruption.³¹ Governors provided law and order, militia defense, management of credit and currency, black market access, and land distribution for the colony (McCusker and Menard 1985). These services are interrupted when the governor is sacked, and thus the economy experiences a short-run disruption. I assume this disruption lasts only a single period; installation of a new governor in the next period restores these services. Low-investment returns V_L are not lost by settlers in case the governor is sacked. Investments outside of the economy do not take their value from a well functioning public sector.

Note that $\sigma_G > 0$, so the governor does not obtain zero payoff from being sacked. Governors could execute rapid transfers of land or appointments to office for themselves and close family and associates, allowing them to claim at least some rents if they expect to leave office. Moreover, their centrality in the colonial economy and administration meant that orderly transition would be in the interest of the Crown (Greene 1898). This would be facilitated by conceding at least some rents to the governor upon termination from office.

Settler Rebellion. If the Crown retains the governor, the Crown extracts a share y from $(1 - x)V$. Then (step 5 of the stage game) the settlers observe $(1 - x)(1 - y)V$ and decide whether to remain loyal or rebel. Either choice ends period t , and all players move on to period $t + 1$.³² If settlers remain loyal, period t payoffs are $u_G^t = x^t V^t$, $u_C^t = y^t (1 - x^t) V^t$, and $u_S^t = (1 - x^t)(1 - y^t) V^t + (1 - e^t) V_L$. If settlers rebel, period t payoffs are $u_G^t = \rho_G V^t$, $u_S^t = \rho_S V^t + (1 - e^t) V_L$, and $u_C^t = \rho_C V^t - M$. The shares $\rho_i \in (0, 1)$ are exogenous parameters. I assume that $\sum_i \rho_i < 1$, so that rebellion destroys some economic output in period t .³³

North American settler rebellions were rare before 1776, but several did occur (Virginia, 1675–1676; Maryland, 1676; Carolina, 1677; New York, 1688), and they imprinted an unpleasant memory on future monarchs. For example, to suppress Bacon's Rebellion (Virginia, 1676; this is discussed in more detail below after the model analysis is complete), Charles II dispatched a battalion of 1,000 Redcoats and 14 war ships—an exceedingly large mission at the time for the distance involved (Webb 1995). Thus, rebellions were costly for the Crown, represented in the model as a parameter

²⁶ For simplicity, I often refer to x and y as "tax rates," but in fact they represent any diversion from the real economy for the governor and Crown, respectively.

²⁷ Starting in 1651, the Navigation Acts required all colonial exports to travel on English ships to English (or colonial) ports, thus claiming monopoly terms of trade for the mother country. In addition, duties were collected at the importing port. However, by law, colonial governors (and not the Crown's customs officers) were responsible for supervision of colonial shipping until 1696 (Rabushka 2010), so they were central for black market access. Estimates suggest that the revenue lost from North American black market trading in the 1680s was on par with revenue actually collected under the Navigation Acts—into the £100,000s per year, against annual English government revenue of about £1,800,000.

²⁸ In 17th-century Virginia, internal tax payments were usually in kind due to constant shortages of paper money (Wertenbaker 1914).

²⁹ On some occasions, governors had to post bond to the Crown for observance of specific instructions. They could also be sued at the King's Bench for criminal misconduct or damages, but not in colonial courts (since they often selected the judiciary).

³⁰ In principle, the σ_i 's (and ρ_i 's—see below) could be partially endogenized. Some portion of the economy could be exogenously destroyed in case of governor turnover or settler unrest, and the rest could be distributed in a bargaining game before proceeding to period $t + 1$. Intuitively, the remaining period t output would be allocated in proportion to relative discount factors.

³¹ During the Interregnum, the legal authority of governors with royal commissions was unclear before Parliament's authority stabilized. Colonies found their governors sufficiently useful that they requested their continued service (Wertenbaker 1914).

³² An alternative possibility, that rebellion ends the game for C and G , is considered later in this section.

³³ The model makes no assumption about the size of $\sum_i \sigma_i$ vs. $\sum_i \rho_i$.

M . Since the governor did not have a military independent of the militia, which cannot be counted on in rebellion, governors did not face costs of rebellion on the same scale. I will assume that

$$M \geq 1 + V_H \quad (2)$$

so that the Crown would never voluntarily and knowingly permit a rebellion.³⁴

Analysis

There is an essentially unique³⁵ stationary subgame perfect equilibrium (stationary SPE) in the repeated game for a given parameter configuration. It is one of two types. In **extractive equilibrium**, the governor is retained in every period; in **sacking equilibrium**, the governor is sacked in every period. Extractive equilibria are the main focus of the analysis. Sacking equilibria imply restrictions on parameters that may not be substantively plausible, as I discuss further below, but I include them in the analysis for completeness.³⁶ Proofs and derivations of formal statements below are in the Appendix.

Extractive Equilibria and Retention of the Governor.

By definition, an extractive equilibrium is a stationary SPE of the hierarchical agency model with retention of the governor in every period. This exists when the governor and Crown both receive enough rents each period to prefer having the governor retained over being sacked, and enough of the economy is left for settlers to prefer loyalty over rebellion.

More specifically, if G is retained in the stage game, then S has a decision to remain loyal or rebel. Settlers remain loyal if their cut of economic output V in a given period is at least as great as their cut if they rebel:

$$\rho_S \leq (1 - x)(1 - y). \quad (3)$$

This is S 's **loyalty constraint**.³⁷ In view of the high cost of rebellion M (Equation (2)), C will sack G if the loyalty constraint cannot be satisfied given x . Thus, an extractive equilibrium requires not only retention of the governor but therefore also settler loyalty every period.

³⁴ Since all players continue to period $t + 1$ after rebellion, it is akin to temporary civil unrest, rather than a permanent revolution. This captures almost all episodes of unrest in English North America. However, as will be shown, **inequality (2)** is already sufficient to induce C to prevent rebellion on the equilibrium path; permanent revolution would only strengthen its incentive to do so.

³⁵ These are "essentially unique" because multiple choices of x will result in the governor being sacked each period when stationary SPE calls for it, but the other stationary SPE strategies, the outcome, and payoffs are unique.

³⁶ A third type of equilibrium, called **cooperative equilibrium**, is discussed below. These are subgame perfect but not stationary. They rely on folk theorem arguments and, as I explain, are not exceedingly compelling in substantive terms in the present application.

³⁷ I assume that any player making a binary choice $z \in \{0, 1\}$ chooses 1 when indifferent.

Retention of G in equilibrium also requires incentive constraints for *both* G and C : C has to want to retain G , and G has to want to be retained. A necessary condition for C to prefer retention in a given period is

$$y(1 - x) \geq \sigma_C. \quad (4)$$

If this does not hold, C obtains greater utility from sacking G and moving to the next period. Joint satisfaction of this constraint and the loyalty constraint is necessary and sufficient for C to prefer retention.

For the governor's part, in a stationary equilibrium with retention, G obtains xV every period, for an infinite flow of benefits with present value $\frac{xV}{1-\delta}$. If instead G were sacked, he would obtain the one-time payoff $\sigma_G V$. G prefers to be retained if and only if

$$x \geq (1 - \delta)\sigma_G. \quad (5)$$

A high discount factor relaxes G 's constraint, because he places high value on the flow of future payoffs he obtains from retention.

Putting constraints (3), (4), and (5) together yields

Proposition 1 *An extractive equilibrium exists only if the economic cost of sacking the governor is sufficiently high, or*

$$\sigma_C + (1 - \delta)\sigma_G \leq 1 - \rho_S. \quad (6)$$

Inequality (6) is the **retention constraint**. It requires that the share of V needed to make G and C both prefer retention does not exceed the share of V left after settlers are induced to remain loyal. If G and C have less than a share $\sigma_C + (1 - \delta)\sigma_G$ to divide between themselves, at least one of them will prefer to have G sacked. However, settler loyalty implies that at most the share $1 - \rho_S$ will be available for G and C to split. Retention is possible in any equilibrium (stationary or otherwise) if and only if the amount available is at least the amount required. The constraint becomes easier to satisfy as the governor and Crown incur greater economic costs from sacking the governor (σ 's are smaller), when the settlers fare poorly under rebellion (ρ_S is smaller), and when the governor places more weight on the future stream of payoffs (δ is larger).

A simple way to view the retention constraint is as a limit on the short-run economic disruption caused by sacking the governor. If $\sigma_C + \sigma_G$ is small, this disruption is large, at least as far as imperial authorities are concerned. Large economic disruption means the imperial authorities fare poorly if they do not mollify the settlers, so it is easier to do so.

When the retention constraint is satisfied, we can turn to the distribution of surplus rents between the players, and its effect on settler investment. In an extractive equilibrium, settlers make the same investment decision e in every period. Because the Crown's utility is increasing in its share y for given V , it prefers to concede rents $\rho_S V$ to settlers—just enough to satisfy the loyalty constraint with equality, given G 's tax rate

x .³⁸ This implies C will choose

$$y^*(x) \equiv 1 - \frac{\rho_S}{(1-x)}. \quad (7)$$

This captures the strong agenda power the Crown has over settlers. The Crown moderates rent extraction just enough to induce loyalty, but no more. C must moderate its rent extraction y by S 's take in case of rebellion (ρ_S), adjusted for the rent extraction (x) by G . As settlers do better in case of rebellion (and holding x fixed), more rents must be conceded by C . And as G takes more rent, C must moderate its rent extraction.

In extractive equilibrium, the governor has strong agenda power with respect to the Crown, just as the Crown does with respect to settlers.³⁹ In particular, G concedes just enough to allow C to satisfy the loyalty constraint with equality and to make C indifferent between sacking and retaining. G then keeps the rest of the pie for itself. C would like to threaten G with sacking unless G concedes more rents to C , but because sacking is costly for C (due to short-run economic disruption), this threat is credible if and only if C 's retention constraint binds (this is proved formally in Remark 1 below).

As a result, the governor's share in an extractive equilibrium is $x^* = 1 - \rho_S - \sigma_C$. Substituting x^* into Equation (7) yields a share $y^* = \frac{\sigma_C}{\rho_S + \sigma_C}$ to the Crown. This implies the following proposition.

Proposition 2 *If the economic cost of sacking the governor is sufficiently high (the retention constraint, inequality (6), holds), the unique stationary subgame perfect equilibrium is an extractive equilibrium. In every period, settlers are indifferent between rebellion and loyalty; the Crown is indifferent between sacking and retaining the governor; and the governor captures all surplus rents ($1 - \rho_S - \sigma_C$).*

They are called “extractive” because they involve maximal rent extraction from settlers every period, given the loyalty constraint. Propositions 1 and 2 together imply that the retention constraint, $1 - \rho_S \geq \sigma_C + (1 - \delta)\sigma_G$, is necessary and sufficient for existence of a unique extractive equilibrium.

Extractive equilibria have a simple retrospective character within each period. If total rent extraction was too high, the settlers rebel. If the governor's rent extraction was too high, the Crown sacks him. “Too high” is judged by each player relative to its payoff in case punishment is inflicted. In particular, rent extraction from settlers is constrained by their “outside option” of rebellion (provided this value is not so high that the retention constraint from Proposition 1 fails).

³⁸ S would like to threaten C with rebellion unless C concedes more rents, but this threat is not credible if the loyalty constraint holds strictly. In that case, rebellion is costly for S . If S prescribed rents r every period, and C took more rents than prescribed just once, S would not want to incur the cost to punish this, because it would bring no future benefit.

³⁹ I comment further on the governor's agenda power after the equilibrium analysis is complete.

As for the Crown, we can think of σ_C as measuring the governor's value directly to the Crown in the short run. When σ_C shrinks, the Crown does worse in the short run without the governor, and thus the short-run value of the governor to the Crown grows. In extractive equilibria, the governor exploits his value to the Crown, and the Crown's strong desire to prevent rebellion.

The key question in this model is investment e by settlers. Settler investments are sunk in each period, so they face a hold-up problem after high investment that is mitigated only by the possibility of settler rebellion in extractive equilibrium. Thus, high investment brings returns V_H to the economy, but settlers capture only $\rho_S V_H$ of the marginal returns. Low investment, on the other hand, brings returns V_L that are safe from imperial rent extraction. Thus, settlers invest in extractive equilibrium if and only if the **investment constraint** is satisfied:

$$\rho_S \geq \frac{V_L}{V_H}. \quad (8)$$

This constraint is easy to satisfy when returns to investment (V_H) are very high. In that case, even a small share of a vastly enlarged pie meets the incentive constraint for settlers. In addition, settlers get more in extractive equilibrium when they do relatively well in rebellion, and so the constraint is easier to satisfy as ρ_S increases—provided it is not so large that the retention constraint (Equation (6)) fails.

Combining the retention and investment constraints, it follows that a high investment extractive equilibrium exists if and only if $1 - \sigma_C - (1 - \delta)\sigma_G \geq \rho_S \geq \frac{V_L}{V_H}$: the economic disruption from sacking, and the returns to settler investment, are both high. But if the disruption from sacking is large, and returns to settler investment are middling or worse (V_H close enough to V_L), then settlers do not gain enough from investment to compensate for their hold up problem. In these cases, investment is low, and rent extraction by the Crown and governor undermines efficiency in equilibrium.

This logic is summarized as follows.

Proposition 3 *Assume the economic cost of sacking the governor is sufficiently high (the retention constraint, inequality (6), holds). Then there is high settler investment in the unique extractive equilibrium if and only if returns to settler investment are sufficiently high (i.e., the investment constraint, inequality (8), holds).*

Sacking Equilibria. Extractive equilibria involve governor retention in each period. By Proposition 1, if the retention constraint is not satisfied, all stationary equilibria entail sacking the governor in every period. When G is sacked, the payoff to player i is $\sigma_i V$, so S invests ($e = 1$) in a sacking equilibrium if and only if $\sigma_S V_H \geq V_L$.

Proposition 4 *If the economic cost of sacking the governor is sufficiently low (the retention constraint, inequality (6), fails), the governor is sacked every period*

in a stationary subgame perfect equilibrium. Settlers invest if and only if $\sigma_S \geq V_L/V_H$.

However, sacking equilibria call into question why the colony exists at all. Intuitively, settlers must do so well by rebelling, or the governor contributes so little to the colony's value, that the imperial authorities are better off crippling the colony and running it without a governor every period. Colonial governance is not doing much good in this case, so it is better to dissolve it. Sacking equilibria with high-value investment exist only if both ρ_S and σ_S are very high, such that settlers obtain little benefit from the law and order (etc.) provided by the colonial governor, and would do relatively well under rebellion.

Cooperative Equilibria. In some cases, there are also subgame perfect equilibria in which S 's loyalty constraint is strictly satisfied. These "cooperative equilibria" alleviate inefficiencies from low investment as well as allowing S to capture more rents. An example of this type of equilibrium is presented in the Appendix. Here I will discuss some intuition behind them and then explain why they are not deeply compelling on substantive grounds. While subgame perfect, these equilibria involve history-dependent, or nonstationary, strategies.

Cooperative equilibria require several restrictions on parameters. First, the retention constraint (Proposition 1) must be satisfied. Second, the discount factor δ must be large enough. Players need a carrot of high future payoffs to sustain cooperative equilibria. Third, the investment constraint must not be satisfied. This is essential for making credible threats that underpin these equilibria.

Credible threats to sustain cooperative equilibria can come only at the stage of settler investment or governor rent extraction.⁴⁰ Settlers can threaten the governor and Crown with a trigger strategy: low investment forever in the future if C and G do not restrain their rent extraction today. The settlers' threat is to play the (inefficient) extractive equilibrium in every subsequent period after the Crown or governor deviate from the cooperative equilibrium path. Since the extractive equilibrium is subgame perfect, this threat is credible by construction. Restraint by the governor and Crown to taxes below the extractive equilibrium levels supports investment in every period on the equilibrium path.

However, cooperative equilibrium arguments are not exceedingly compelling ways around inefficiency or low rents for S and C in extractive equilibria. Despite the intuition that the Crown (at least) is a "long-run player" and should place high weight on the future, it is not likely that early modern Crowns and governors had the high discount factors needed to sustain these equilibria. These Crowns were perennially cash strapped and indeed famous for trading valuable long-term assets for small but immediate gain (Pritchard

⁴⁰ The only other threats are to rebel or sack, but these are not credible unless the loyalty and/or retention constraints hold with equality—exactly the conditions that characterize extractive equilibria. Therefore, these threats will not create cooperative equilibria.

2007)—the hallmark of a small discount factor. This is particularly true of the pre-revolutionary Stuarts in England, who struggled to find revenue sources in the face Parliament's resistance at home (Rabushka 2010). North and Weingast (1989), Stasavage (2003), and Cox (2016) all point out these same monarchs were unable to restrain their own expropriation from investors, at major long-run cost to themselves. Folk theorem arguments imply these monarchs should have avoided this problem. Clearly, their discount factors were sufficiently low as to make their weak commitment ability legendary.

The Colonial Governor's Agenda Power

The governor has striking agenda power in extractive equilibria (Proposition 2). At some level, this agenda power comes from fundamental strategic problems of colonial governance: the necessity of a governor for colonial possession, the economic disruption from sacking the governor, the high cost of rebellion, hold up problems facing settlers. Any rent extraction at all requires a governor to hold the land and exercise sovereignty; otherwise the Crown would lose claim to the colony's economic output and likely lose its stream of rents to depredations from another global power.⁴¹ Yet a single agent with the power to exercise sovereignty on the Crown's behalf is powerful enough to threaten the Crown's interests. Imperial governance necessitated this tension in a way that domestic governance in the home country did not.

Several facets of the governor's agenda power in equilibrium have firm theoretical foundations, which I discuss in turn.

Remark 1: The Crown's Retention Rule. The Crown could try to restrain the governor by dictating exactly the share of the economy that should be left for the Crown and by sacking the governor if he does not leave this share. This forces the governor to forgo a stream of future benefits if it takes the short-run temptation of high rents, and the Crown's long horizon of play suggests a benefit from playing tough. This is the classic issue of optimal retention rules in political agency problems.

Perhaps interestingly, this strategy will not work. Specifically, if x^* is the governor's tax rate in an extractive equilibrium, there is no stationary subgame perfect equilibrium in which the Crown can commit to retain G if and only if $x \leq \hat{x}$, for any $\hat{x} < x^*$.⁴² A sitting governor pins its rent extraction to the Crown's payoff under government turnover, and this sharply limits the credibility of the Crown's threat to sack.

⁴¹ There is a legal difference between not having a governing agent at all, and temporary turnover of the governing agent. The former implies loss of sovereignty to the Crown, and with it rights of output. The latter is economically disruptive in the short run, but not the same as ceding sovereignty. See MacMillan (2006) on the legal framework of colonial sovereignty in the early modern era.

⁴² See the Appendix for formal proof.

The limits of the Crown's accountability mechanisms in this model are not driven by specialized equilibrium selection.

The intuition is simple.⁴³ If there were an equilibrium with tighter control of the governor by the Crown, then a deviation by the governor to extract more rent in a single period would by definition not affect the Crown's payoffs in any subsequent period. If the governor's deviation nevertheless satisfied the Crown's retention constraint, then sacking the governor entails a short-run cost.⁴⁴ Since behavior beginning in the next period is the same with or without sacking, the short-run cost has no long-run benefit. Therefore, sacking is not credible.

Remark 2: Stage Game Sequence. In the stage game, the governor moves before the Crown. This matches the administrative sequence of most English imperial taxation, as noted above (and see Rabushka 2010). Nevertheless, it may seem that allowing the governor to move first hard-wires its commitment power, to the disadvantage of the Crown.

However, the crucial assumption is actually not that the governor can commit to *go first*, it is that the Crown cannot commit *not* to go last. If so, then the governor can always find a tax rate that, given the Crown's, would induce rebellion, but that the Crown prefers to accommodate by modifying its rate instead of sacking the governor.⁴⁵ Then the Crown would want to change its tax rate.

The reason to assume the Crown can revise its policy is that it is the essence of sovereignty. Sovereignty implies the right to act—thus also the right to change actions. Indeed, *preventing C* from revising its actions within a period would be a strong assumption that *C* can commit. A classic example of Crown revision of its policy comes from the Navigation Acts, which required all colonial exports to travel on English ships to English ports, where they would be subject to English duties. But the Crown routinely suspended them and tolerated their breach for nearly a century, and did so strategically when stability was threatened. For example, Carolina was exempted from the Navigation Acts from 1663 to 1670 when its stability was in question, and they were hardly enforced to 1682 as the colony reeled from Culpeper's Rebellion. More generally, numerous tax exemptions were tailored to North

American colonies in delicate situations (Rabushka 2010, 64).

This result also requires that the governor can act independently of the Crown, which is necessary for any agency problem at all. In English North America, governors indeed had scope for independent action because their administrative actions (e.g., land allocation) were not controlled by the Privy Council or colony proprietors in London; they were set within colonies in response to local needs and conditions (Rabushka 2010). Taxes established in law were theoretically reviewable by the Privy Council, but the Council itself did not legislate for the North American colonies.

Remark 3: Selling Offices. A natural intuition is that the Crown can solve its agency problem by selling the office of the governor for some carefully chosen value. Selling the governor's office occurred sometimes in the 17th century (Greene 1898), though it was not universal and the prices seem far below the rents available to the governor.⁴⁶ Nevertheless, selling the office is an intriguing theoretical possibility: it definitively allows the Crown to "move first" by setting the exact rents that must be delivered and might seem akin to the "sell the firm to the agent" approach to achieving the first-best in moral hazard problems.

In fact, it is quite different. Charging the governor for the office would merely redistribute rents from the governor to the Crown. It would not change the investment constraint that determines settler investment in extractive equilibrium,⁴⁷ which is the key point for efficiency. Substantively, selling office is quite different than conferring rights to literally all economic output from a colony to a governor. Yet that is required to effect the standard solution of giving the agent residual claimancy in moral hazard. Mineral rights, exclusive trading arrangements, and import duties are forms of rent extraction, and the English Crown never made a pretense of giving up those rights.⁴⁸

Ultimately, this article's main point, below, is about the comparative effect of hierarchical control versus separation of powers on settler investment—not the exact distribution of rents between the governor and Crown. The important point about extractive equilibria is not that the governor takes *all* surplus rents, it is that the settlers take none. Even if the Crown devised measures to claim rents from the governor, they are still taken from settlers.

⁴³ It is also familiar from Fearon (1999). That paper is about adverse selection, of which there is none in my model, but his point more generally is that if there is even a peppercorn of cost from dismissing the agent, the *ex ante* optimal retention rule is not credible.

⁴⁴ This is a crucial difference between my model and the standard political moral hazard models of Barro (1973) and Ferejohn (1986): in those models, replacing the agent is payoff irrelevant, so the *ex ante* optimal retention rule is credible.

⁴⁵ See the Appendix for formal proof. The proof does not show, of course, that *G* has more resolve than *C* not to modify its policy—only that *C* would modify if it had to, and *G* moving first does not affect this. If *G* and *C* can both reduce their cut to prevent rebellion, their resolve would be determined in the equilibrium of some unmodeled game. However, it is natural to suppose that a player's equilibrium resolve is declining in its cost of rebellion. This would disadvantage the Crown because its cost of military intervention is large.

⁴⁶ Greene (1898) reports that the right to hold the post indefinitely at the king's pleasure, when it was sold, cost less than £1000 (lump sum) in this period, but the salary alone of the office was greater than that each year (47, 63). Prices may have been low because governorships were often awarded in return for favors to the Crown, to former military officers after meritorious service, or to "later sons" of English peers whose very purpose in America was to raise a fortune (Elliott 2007).

⁴⁷ See the Appendix for formal proof.

⁴⁸ Even the proprietary charters that restricted the Crown the most, for example, the original grant of Maryland to Lord Baltimore (1632), granted it rights to mineral wealth found in the colony.

EMPOWERING SETTLERS: SEPARATION OF POWERS

This model reveals the stark agency problem that the Crown faces with the governor. We should expect rent-maximizing Crowns to devise institutions to mitigate that problem. One possibility is to delegate control of the governor to the settlers. In extractive equilibria, the Crown and the settlers have a common interest in restraining the governor's rent extraction. The Crown can leverage this common interest by empowering an independent settler assembly to check the governor's power, and separating it from the governor's control. This can constrain the governor sufficiently that settlers invest—and thereby increase the Crown's rents.

There are two essential elements of 17th- and early 18th-century elected colonial assemblies to consider in a model. First, the focus of these assemblies was overwhelmingly on fiscal matters (Greene 1963; Elliott 2007).⁴⁹ The assemblies took control of raising and appropriating public revenue for internal colonial business, and fiercely resisted attempts at direct taxation by the Crown. Governors administered the appropriated funds under close supervision by the assemblies. Thus, assembly independence from the governor and separation of powers in colonial constitutions developed hand in hand. Second, the Crown was the legal basis for colonial institutional forms (Keith 1930). Colonial assemblies could only function in the long run with its assent and recognition.

Bringing these elements together, the model of separation of powers allows settler determination of funds available to the government, but only if the Crown prefers to recognize this right. The new stage game begins with C choosing to have S play the separation of powers game or the baseline game above.⁵⁰ In separation of powers, S chooses a public sector budget $0 \leq P \leq V$ for G and C to split. Play then proceeds as before with choice of tax rates, and possibilities of sacking and rebellion.

If settlers allocate the budget P in period t under separation of powers, and the governor is retained and settlers are loyal, then payoffs in that period are

- $u_S = (V - P) + (1 - x)(1 - y)P + (1 - e)V_L$,
- $u_G = xP$,
- $u_C = y(1 - x)P$.

If the settlers are not loyal or the governor is not retained under separation of powers, then payoffs are as in the baseline game. A sacked governor affects not only the government budget; it affects all of V . And the stakes of a settler rebellion are not merely its appropriation of public money; it is all of V .

⁴⁹ Significant redistribution to the poor did not occur through the government (Taylor 2002).

⁵⁰ Therefore, the Crown's institutional choice recurs every period—separation of powers is not assumed to be sticky. Thus, I do not assume that it is a commitment by C to some flow of rents to S for investment, nor can C tie its future hands about colonial institutions. Credibility and stickiness of liberal institutions in colonies should be explored in future research.

Since sacking gives exactly the same utilities in the separation of powers and baseline agency games, the retention constraint is the same in each case. However, in separation of powers, settlers now have proposal power to implicitly determine precisely which incentive compatible share of the pie is taken by the governor. In extractive equilibria of the baseline game, the governor uses agenda power to choose its most preferred share that satisfies the retention constraint. That is the crucial difference between the games.⁵¹

Suppose there is a stationary subgame perfect equilibrium such that the Crown chooses separation of powers, settlers choose a budget P , the Crown retains the governor, and settlers remains loyal in every period. The retention constraint (Proposition 1) implies the **separation of powers budget constraint**,

$$P \geq ((1 - \delta)\sigma_G + \sigma_C)V. \quad (9)$$

If inequality (9) does not hold, the retention constraint cannot be satisfied, and G is sacked. If it does hold, G leaves $\sigma_C V$ for C . G then keeps $P - \sigma_C V \geq (1 - \delta)\sigma_G V$ and so prefers to be retained.

In equilibrium under separation of powers, S pays exactly enough to keep the colonial administration running: the separation of powers budget constraint holds with equality. Any additional payment would be extracted by G . Any less, and the administration would shut down, which S does not prefer as long as the retention constraint holds.⁵² The equilibrium budget P leaves a share of the economy σ_C to C , $(1 - \delta)\sigma_G$ to G , and $1 - \sigma_C - (1 - \delta)\sigma_G$ to S . Thus, empowering the assembly shifts agenda setting powers from the governor to the settlers.

Note, therefore, that conditional on the settlers' investment e , the Crown's payoff is $\sigma_C V$ under either separation of powers or an extractive equilibrium.⁵³ It is only the governor's share that is restrained by separation of powers in equilibrium, and the rents are transferred to settlers. In this way, separation of powers clearly restrains the Crown's agent.⁵⁴

From the Crown's point of view, this restraint on the governor is beneficial because it affects settlers' incentives to invest. Settlers will invest ($e = 1$) under

⁵¹ The assembly's bargaining power is, therefore, very stark in this model. It is natural to expect a smooth relationship between the degree of assembly bargaining power and settler incentives to invest, but this would be useful to explore in future research.

⁵² If the retention constraint is not satisfied, there is only a sacking equilibrium, and separation of powers is irrelevant to all players' payoffs.

⁵³ It is easy to imagine that C faced a small cost from intervening in colonial constitutions to create separation of powers so that it is not in general indifferent about doing so.

⁵⁴ As $\delta \rightarrow 1$, the governor's cut in extractive equilibria vanishes, and the model collapses to the special case of a Crown committing itself through a constitution to protect investors—the celebrated insight of North and Weingast (1989). More generally, if the Crown had a magic spell to seize all rents from the governor, separation of powers would be useful only to restrain the Crown itself. Likewise, if the Crown could remove itself from the rent extraction process completely, separation of powers would still be useful to restrain its agent.

separation of powers if and only if

$$1 - \sigma_C - (1 - \delta)\sigma_G \geq V_L/V_H. \tag{10}$$

In contrast, in an extractive equilibrium of the hierarchical agency game, investment occurs if and only if $1 - \sigma_C - (1 - \delta)\sigma_G \geq \rho_S \geq V_L/V_H$ (inequalities (6) and (8)). When investment returns are very high (V_L/V_H is very low), inequalities (6), (8), and (10) are all satisfied, and high-value investment would occur in both separation of powers and the hierarchical agency game. But for moderate investment returns, inequality (10) is satisfied, while inequality (8) is not. Then high-value investment occurs only under separation of powers.

This is summarized in the following proposition, and illustrated in Figure 1 below.

Proposition 5 *Assume the economic cost of sacking the governor is sufficiently high (the retention constraint, inequality (6), holds). If investment returns are very high, investment occurs in extractive equilibria without separation of powers. If investment returns are very low, investment occurs neither under separation of powers nor extractive equilibrium. If investment returns are moderate, then investment occurs under separation of powers but not extractive equilibrium.*

When returns are moderate, separation of powers leads to an efficiency gain—higher settler investment—that benefits the Crown. The Crown has a strict incentive in

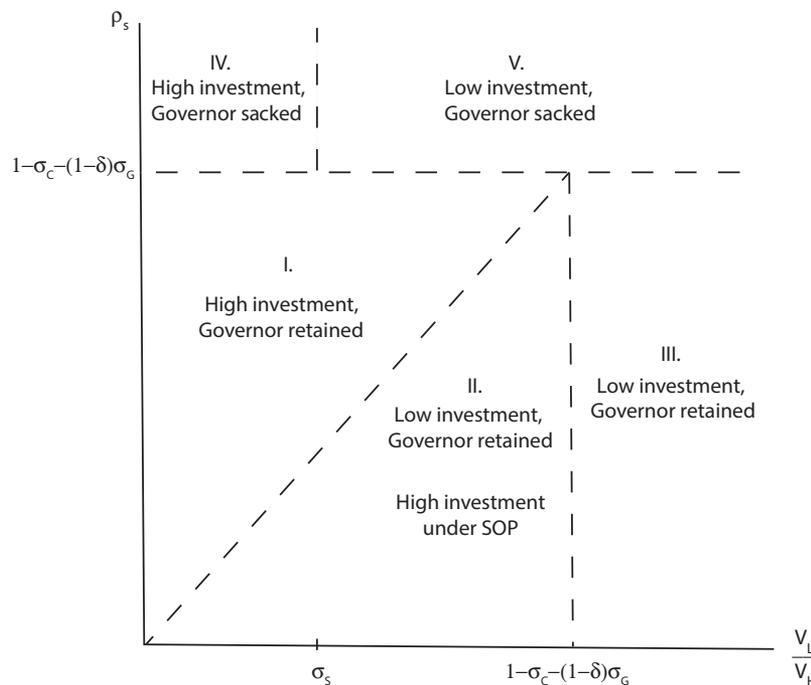
this case to empower settlers to restrain governors.⁵⁵ With low returns on investment, we would expect the Crown to be relatively disinterested in restraining the governor through colonial institutions. With high investment returns, we would expect the Crown to be satisfied with extractive equilibria (though separation of powers also supports high investment in these cases). But with intermediate returns, it is reasonable to expect the Crown’s active support (and per force, toleration) of independent colonial assemblies with power of the purse—a fundamental component of separation of powers. This is interesting because the Crown is assumed to pursue only its own economic rents; in this case, they are bolstered by protecting liberal institutions of government, with an ensuing gain in efficiency.⁵⁶

In the next section, I interpret historical patterns of New World institutional development in light of this result.

⁵⁵ In a stationary equilibrium, the Crown would support separation of powers in every period in this case.

⁵⁶ Moreover, the empowered assembly could make settler control credible if it is self-enforcing once assembly rights are codified in law, in the spirit of De Lara, Greif, and Jha (2008); Fearon (2011); and Dragu and Polborn (2013). In essence, abrogation of assembly rights by imperial officials could alleviate coordination problems among settlers in identifying the right time to rebel. Exploring these possibilities could be interesting in future research.

FIGURE 1. Investment and retention in extractive equilibria (Regions I, II, and III) and sacking equilibria (Regions IV and V). Returns to investment shrink as V_L/V_H grows. Separation of powers causes a change from low to high investment in region II



INSTITUTIONAL DEVELOPMENT IN NEW WORLD EMPIRES

Virginia, 1676: Bacon's Rebellion. The logic of the model is aptly illustrated by Charles II's response to Bacon's rebellion in Virginia in 1676. The colony had been governed by William Berkeley, nominally as an agent of the Crown since the Restoration of the English monarchy in 1660. Governor Berkeley prevented new assembly elections from 1661 to 1676, and he used his power to fill up vacancies to stack the Burgesses with his allies (Wertebaker 1914). Berkeley also controlled assignment of valuable public executive offices (which sitting Burgesses were not prohibited from holding at the time), and granted enormous tracts of the best land to favored Burgesses (Elliott 2007). Berkeley himself sat *ex officio* in the assembly, facilitating coordination with Burgesses and monitoring deals (Webb 1979). In this manner, the governor obtained the assembly's complicity in governing the colony as a large rent extraction scheme.

The resulting colonial taxes (principally a poll tax) were oppressive and highly regressive; middle and lower class households paid upwards of half their annual harvest in taxes (Taylor 2002). The governor poured the money into such public goods as high salaries for council members (about 250 pounds of tobacco per Burgess per day the assembly was in session),⁵⁷ bills for their arduously long meetings at Richmond taverns, and a system of earthen fortifications that, while largely useless from a martial point of view, were conveniently located on the estates of political elites, which thus required large public subsidies for property improvement (Webb 1995).

Middle-class planters responded to sharply limited quantities of suitable land to cultivate crops to meet the high tax burden by building small farms on the fringes of Indian country. This was an attempt to bring new land into cultivation, thereby raising output and productivity to meet the extraordinary demands of the colony, and also of course to put more production beyond the immediate view of colonial authorities. The Indians, harassed by the settlers, complained to colony officials for redress. The governor maintained and captured rents from lucrative Indian trade and did not want it disturbed, so the assembly attempted to tamp down on frontier settlements (Webb 1995).

The settlers, led by one Nathaniel Bacon, a well-born Englishman lately in America to make his fortune, rebelled against the colonial government in 1675-76. Bacon's rebellion took up apparently most of the young, middle-class men of the colony. It culminated in the destruction by the rebels of the capital in Richmond and many surrounding estates of elites, including that of Governor Berkeley (Webb 1995). The rebellion disrupted all economic activity in the colony for months and threatened the king's £100,000+ revenue from Virginia tobacco (against annual royal treasury revenue of

about £1,800,000), but lost steam when Bacon precipitously died of illness in 1676.

Deeply alarmed by the loss of official control and threat to revenue,⁵⁸ Charles II dispatched 1,000 Redcoats, 14 war ships, and a retinue of advisors to restore order and institute reforms. This was easily the most extensive and costly English or British military police action in the New World before the Revolutionary War. The royal commissioners took a statement of grievances from the people of each county—a striking acknowledgement of the legitimacy of a popular insurrection by an absolutist-leaning Stuart Crown. The commissioners ascribed the rebellion to extreme rent extraction and political corruption by the governor and assembly. Aside from the obvious costs of military instability, this undermined the interests of the Crown in a large economy to provide abundant revenue. The king's commissioners wrote of the common planters,

[T]is to be more than fear'd...that they will either Abandon their Plantations, putt off their servants, dispose of their Stocks, and away to other Parts; or else the most part of them will only make Corne instead of Tobacco—and soe sullenly sit downe, carelesse of what becomes of their own Estates or the King's Customes.⁵⁹

Needless to say, corn in tobacco country was not very useful to the king's treasury.

The king's commissioners recommended reforms to tie the assembly more closely to the common planters and break its complicity with the governor (Elliott 2007). These included requiring a new election every time the Burgesses were to meet (which increased turnover and reduced the governor's ability to trade favors), an end to the governor's participation in the assembly, and an end to executive office holding by Burgesses (Rainbolt 1967; Webb 1979). The executive and legislative functions of colonial government were thus to be separated (Webb 1979; Taylor 2002), and the burgesses tied more closely to the common planters (Rainbolt 1970). As if acknowledging the legitimacy of grievances behind a mass rebellion were not enough, here was the spectacle of a Stuart king moving for more frequent popular elections.

After the Crown's intervention, the governor was no longer able to govern in a cartel with the Burgesses. Virginia electoral politics, therefore, took a more popular cast in the 1680s and 1690s (Rainbolt 1970). Burgesses became more attentive to the desires and interests of common people, competing for office by proclaiming their opposition to taxes (Taylor 2002). Within 15 years of Bacon's rebellion, the poll tax enacted by the Burgesses fell from about 100 pounds of tobacco

⁵⁷ A typical middle-class Virginia planter produced about 1,000 pounds of tobacco per year (Taylor 2002).

⁵⁸ Colonial revenue was particularly important to the Stuart kings, who struggled to find sources of revenue independent of Parliament before the Revolution of 1688.

⁵⁹ Commissioners Sir John Berry and Colonel Francis Moryson to Clerk of the Privy Seal Office, Feb. 10, 1677, Colonial State Papers, CO 1/39, No. 32.

TABLE 1. Assembly Creation, 17th-Century English Colonies

	North America	Caribbean/West Indies
Royal authority	13	3
Interregnum (1649–1660)	1	4

per tithable person to less than 20 pounds (Rabushka 2010).⁶⁰

In short, from the Crown's point of view, extreme rent extraction by the colonial government threatened the economic output of the colony. This inhibited the flow of revenues from the colony to the Crown. The Crown, therefore, instituted reforms to restrain rent extraction in the colony that put the assembly on the path to developing an independent power base from the governor, and allowed it to check rent extraction from common planters.

English Imperial Governance in the 17th and 18th Centuries. Because of the need for strong governors and high cost of royal intervention, the English Crown faced agency problems with colonial governors across all its New World possessions. Yet the specific agency problem differed across colonies with different economic endowments. This in turn engendered a different strategic Crown response. Thus, the English Crown supported the development of separation of powers in North America, and not elsewhere in the New World (Kammen 1969; North 1990). The model in this article organizes and interprets this historical pattern. This pattern is captured by the relationship between returns to settler investment and Crown support for independent assemblies—the backbone of separation of powers. Roughly speaking, this maps the Caribbean, future United States, and British Canada to Regions I, II, and III in Figure 1, respectively.

First consider returns to settler investment. These were very high in the English Caribbean and West Indies.⁶¹ Their economies were dominated by sugar monoculture, with a small number of extremely wealthy planters.⁶² Sugar was arguably the most capital-intensive consumer product in the world at the time, so scale economies were high. On the other hand, in the future U.S. states, returns to settler investment were more moderate.⁶³ The bulk of export value was from Southern tobacco, indigo, and rice, but Northern timber and fish were significant as well. Scale

economies were modest, and white labor generated most of the value through the 17th century (Taylor 2002). Finally, returns to settler investment were relatively low in British Canada (1763–1867).⁶⁴ Exports were small, and 90% were from fish, whales, and pelts—lightly capitalized, itinerant enterprises with fewer holdup problems.

Now consider Crown support for independent, representative assemblies. One indication of this is their pattern of creation. In the 17th century, England established 21 separate colonies in North America (14) and the Caribbean/West Indies (7), all with representative assemblies of varying strength. They were created throughout the century as specified in Table 1.⁶⁵

In particular, almost all North American assemblies were created under royal authority. This was not due to any liberal tendency or exportation of existing English institutions: during the 11 years of Charles I's personal rule without any parliament at all in England (1629–1640), he oversaw the creation of five new assemblies in North America⁶⁶ and directed his governor to recognize an existing one (Virginia). Charles II, despite his father's execution at the hands of Parliament, oversaw the creation of seven new colonial assemblies⁶⁷ after the Restoration (1660–1685). Assembly rights in North America were almost always codified in charters, whereas in the Caribbean their recognition was principally by a more legally tenuous royal edict (Kammen 1969). North American colonies used power of the purse to discipline royal governors, and by the 18th century, their primacy was unquestioned (Greene 1898; Greene 1963). The Crown always asserted its firm control of the imperial hierarchy (Greene 1986) but overall allowed independent assemblies to flourish in North America.⁶⁸

On the other hand, most assemblies in the Caribbean were created during the Interregnum.⁶⁹ The

⁶⁰ Poll tax revenue in the colony fell by over half in the same time frame, replaced by duties on imported liquor.

⁶¹ Total value of Caribbean/West Indies exports to other British empire destinations, ca. 1770, was £3,910,000 (McCusker and Menard 1985, 160).

⁶² In 1670, half of the arable land on Barbados was owned by just 7% of the planters (Taylor 2002).

⁶³ Total value of exports to other British destinations, ca. 1770, was about £439,000 from New England (McCusker and Menard 1985, 108); £1,050,000 from Virginia (McCusker and Mernard 1985, 130); £550,000 from the lower South (McCusker and Menard 1985, 174).

⁶⁴ Export value from the Canadian Atlantic, ca. 1770, was less than £17,000 (McCusker and Menard 1985, 115).

⁶⁵ Dates are from Kammen (1969). The Interregnum was a period when England was governed without a king, after the execution of Charles I in the English Civil War. It ended with the Restoration of the Stuart monarchy under Charles II in 1660.

⁶⁶ Maryland, Massachusetts Bay, Plymouth, Connecticut, New Haven.

⁶⁷ North Carolina, South Carolina, New Hampshire, New York, East Jersey, West Jersey, Pennsylvania.

⁶⁸ There were exceptions. Some North American colonies were prevented from organizing assemblies temporarily (New York, 1664–1683; Dominion of New England, 1686–1689).

⁶⁹ Antigua, Montserrat, Nevis, St. Christopher. Note all became English possessions under James I or Charles I. Thus, timing of colonization does not explain the lack of assemblies before the Interregnum.

significance of this is that most of these assemblies were apparently emboldened to assert authority by the absence of a king (Kammen 1969); thus, their creation came with a marked lack of royal support. Moreover, most assemblies in the Caribbean were undermined by the Crown and domesticated by the governor after the Restoration, with their powers eroded further in the 18th century (Spurdle 1963).⁷⁰ Royal review of colonial assembly legislation was applied more stringently to the Caribbean than North America (Russell 1915). Caribbean governors had a direct hand in drafting colonial tax legislation (Spurdle 1963) and invoked martial law to govern unilaterally when assemblies failed to heed the Crown's instructions unquestioningly (Webb 1979)—both in marked contrast to North American practice. In addition, the 18th- and 19th-century British acquisitions in the Windward Islands⁷¹ were generally not even extended rights to organize assemblies (Murray 1965).

In Canada, British support for assemblies was among the weakest in any New World colony. From conquest (1763) to the Constitutional Act of 1791, Britain did not provide for Canadian assemblies at all; they were specifically excluded from the Quebec Act in 1774. After 1791, the elected assemblies were weak and there was no separation of powers. Laws were passed by the Crown-appointed governor-general and council. The elected assembly's assent, much less initiation, was not required until the advent of "responsible government" in 1848, at the tail end of British possession (Keith 1912).

Thus, Crown support for independent assemblies exhibits a clear but non-monotonic relationship with investment returns—as implied by the model. This pattern cannot be explained by other natural accounts such as colonial settler population or cultural/religious heritage. For example, the white population of the English Caribbean was very high in the 17th century—in 1650, 44,000 whites on half a dozen tiny islands outnumbered whites in all of English North America combined (McCusker and Menard 1985).⁷² Clearly, white settler habitation was not sufficient for Crown support of separation of powers or independent assemblies. As for culture and religion, Upper Canada (Anglican British loyalists) and Lower Canada (French Catholics) were treated approximately the same in the Quebec Act and Constitutional Act (Keith 1912). But Maryland, with a large plurality of Catholics in prime tobacco country, had assembly rights guaranteed in its charter, and its assembly convened in 1635.

Other New World Empires. The English Crown was not unique in facing agency problems with its colonial governors, but it was unique in empowering independent, broad-based settler assemblies in part of its New World empire (North 1990). While a thorough comparative

analysis of New World imperial governance is beyond the scope of this article, a brief comparison to other notable cases is informative.

The largest and oldest French New World possession was Canada (New France). Its principal export was beaver pelts; agricultural exports to France were negligible (Pritchard 2007). Pelts were procured by trade with Native Americans. French trading companies with monopoly rights required a small labor force for this purpose. This fact, combined with low agricultural productivity in the St. Lawrence valley as compared to France itself, kept the population small (Pritchard 2007).⁷³ Rent extraction from settlers, therefore, did not undermine the Crown's interest in the colony. Correspondingly, at no time were independent settler assemblies contemplated; New France was governed by French courtiers and bureaucrats (Eccles 2010). Despite a change in governing personnel, the British did not institute significant changes in institutions upon conquest.

The Spanish New World Empire was larger, older, and more variegated, but the relevant regularities for this article are simple: its value to the Crown did not derive from widespread settler investment; therefore, it was not compromised by excessive rent extraction from settlers. For its part, the Crown did not support independent settler assemblies (Borah 1956). The predominant resource in the Spanish New World was silver, extracted with forced indigenous labor (Taylor 2002). The obvious agency problem with governors was to induce truthful reporting of the quantity of silver available and to maximize the amount sent to the Crown.⁷⁴ Independent settler assemblies could not address this problem, but mutual monitoring among elites could. This is one way to interpret the high level of elite conflict built into imperial institutions, with the *audiencia* and viceroy reporting on each other directly to the Crown (Elliott 2007).⁷⁵

In short, agency problems with governors were endemic in New World colonies, and we should think of imperial governance institutions as designed in part to mitigate those agency problems. But neither the French nor Spanish New World colonies depended on widespread investment and cultivation by European settlers in the same way that English North America did. This investment is one of the crucial components of the model in this, so it is not surprising, in light of this model, that English/British imperial institutions differed from Spanish and French.

⁷³ About 63,000 French and descendants lived in New France at its height in 1760, compared to about 1.5 million whites in English North America and 435,000 whites in New England alone (McCusker and Menard 1985).

⁷⁴ There were many other agency problems in hundreds of years of imperial Spain, not least inducing the *conquistadores* to settle one place rather than moving on to others in search of gold and to be attentive to Christianization of the Indians (Elliott 2007). These problems led to a web of governance institutions that would be interesting to unpack.

⁷⁵ Unlike the assembly and governor in (most of) English North America, the *audiencia* and viceroy (or governor) did not have independent power bases. Both were agents of the Crown.

⁷⁰ There were exceptions. Some Caribbean assemblies had temporary success in resisting Crown incursions (Barbados, Jamaica).

⁷¹ St. Lucia, Grenadines, Trinidad, Demerara, among others.

⁷² English whites also outnumbered African slaves in the Caribbean 3:1 in 1650, so fear of slave populations is also not a strong explanation.

CONCLUSION

This article contends that colonial governance created agency problems for imperial crowns. Legitimacy and security of imperial claims to colonies, and political stability to generate economic output, required a governor with nontrivial power. But the cost of royal intervention made that power a double-edged sword. I argue that colonial institutions should be understood as reactions to these agency problems.

In English North America, a significant agency problem was rent extraction from settlers by colonial officials. In a formal model of this problem, the Crown's mechanisms of control, principally the threat to sack the governor, have limited efficacy in controlling this rent extraction. This causes settlers to reduce investment in the colonial economy. Separation of powers endows settlers with the power of the purse, which allows them to restrain the governor. This in turn can increase settler investment. Thus, settler empowerment can mitigate the Crown's agency problem with the governor to the Crown's ultimate benefit.

The model shows that this logic operates when returns to settler investment are moderate but not exceedingly high. This rationalizes the development of separation of powers in the 17th- and 18th-century colonies that would become the United States. This separation of powers lasted to the Revolutionary era, and became part of the institutional inheritance of the United States from the British imperial system. This article's contribution is to identify strategic political foundations of the Crown's incentive to support that institutional development. More broadly, the argument advanced here is that a sovereign has incentives to support liberal institutions when they help to resolve agency problems the sovereign cannot fully resolve otherwise.

Appendix: Formal Proofs

Proof of Proposition 1. Suppose a stationary SPE exists with $\{e, x(e), y(e, x), r_C(e, x), r_S(e, x, y)\}$ every period, such that $r_C = r_S = 1$ (G is retained and S is loyal). This equilibrium generates continuation value U_i for player i .

- S prefers $r_S = 1$ over deviating to $r_S = 0$ in a given period if and only if $(1 - x)(1 - y)V + (1 - e)V_L + \delta U_S \geq \rho_S V + (1 - e)V_L + \delta U_S$, or $y(1 - x) \leq 1 - x - \rho_S$.
- C prefers $r_C = 1$ over deviating to $r_C = 0$ in a given period only if $y(1 - x)V + \delta U_C \geq \sigma_C V + \delta U_C$, or $y(1 - x) \geq \sigma_C$. Because $M \geq 1 + V_H$ (Equation (2)), allowing rebellion is never a best response for C . Thus, C prefers $r_C = 1$ if and only if $\sigma_C \leq y(1 - x) \leq 1 - x - \rho_S$.
- G prefers $r_C = 1$, instead of inducing $r_C = 0$ (e.g., by choosing $\tilde{x} = 1$), if and only if $xV + \delta U_G \geq \sigma_G V$. With xV every period in stationary SPE, $U_G = \frac{xV}{1-\delta}$, so G prefers x and $r_C = 1$ over $r_C = 0$ if and only if $x \geq (1 - \delta)\sigma_G$.

Therefore, given stationary investment strategy $e^t = e \forall t$, there exist x and y satisfying all constraints for $r_C = r_S = 1$ if

and only if $(1 - \delta)\sigma_G + \sigma_C \leq 1 - \rho_S$, the retention constraint from the proposition. ■

Proof of Proposition 2. Assume $(1 - \delta)\sigma_G + \sigma_C \leq 1 - \rho_S$. Given a stationary investment strategy $e^t = e \forall t$, C solves $\max_{y,y(1-x)V}$ subject to the loyalty constraint, so $y^*(x) = 1 - \frac{\rho_S}{1-x} \forall t$. G solves $\max_x xV$ subject to retention by C , so $x^* = 1 - \rho_S - \sigma_C \forall t$. Inserting x^* into $y^*(x)$ yields $y^* = \frac{\sigma_C}{\rho_S + \sigma_C}$. Given strictly monotone utilities and linear constraints, these are the unique optimal choices every period. Given stationary parameters and stationary strategies for other players, the best response e must be unique in each period and stationary. This implies $u_S = \rho_S V + (1 - e)V_L$, $u_C = \sigma_C V$, and $u_G = (1 - \rho_S - \sigma_C)V$ in each period, so $r_C^* = r_S^* = 1$. ■

Proof of Proposition 3. Assume $(1 - \delta)\sigma_G + \sigma_C \leq 1 - \rho_S$. Given the unique sequentially rational stationary strategies $\{x, y, r_C, r_S\}$ in Proposition 2, S faces $u_S(e = 1) = \rho_S(1 + V_H)$ and $u_S(e = 0) = \rho_S + (1 - e)V_L$ each period. Thus, $e = 1 \forall t$ is optimal if and only if $\rho_S \geq \frac{V_L}{V_H}$; otherwise, $e = 0 \forall t$ is optimal. ■

Cooperative Equilibria. Assume $\rho_S < \frac{V_L}{V_H} < 1 - \sigma_C - (1 - \delta)\sigma_G$, so the extractive equilibria entails low investment. The cooperative subgame perfect equilibrium with $\{e = 1, x = \sigma_G, y = \frac{\sigma_C}{1-\sigma_G}, r_C = 1, r_S = 1\} \forall t$ is supported by the following trigger strategy for S :

- Cooperative phase: play the prescribed strategies in period 1 and in any history such that G and C chose as prescribed in all prior periods.
- Punishment phase: Play extractive equilibrium with $e = 0$ otherwise.

The punishment phase is credible to carry out because it is an SPE. In the cooperative phase, assume G adheres to the cooperative equilibrium. Adhering to the cooperative equilibrium gives C the continuation value $\bar{U}_C = \frac{(1+V_H)\sigma_C}{1-\delta}$. But C is tempted to choose $y = 1 - \frac{\rho_S}{1-\sigma_G}$ in this case. This generates the continuation value $\hat{U}_C = (1 - \rho_S - \sigma_G)(1 + V_H) + \frac{\delta\sigma_C}{1-\delta}$. Solving $\bar{U}_C - \hat{U}_C \geq 0$ for δ yields the critical value $\delta_C^* \equiv \frac{(1+V_H)(1-\rho_S-\sigma_G-\sigma_C)}{(1+V_H)(1-\rho_S-\sigma_G)-\sigma_C}$. Note that $\delta_C^* \rightarrow 1$ as $\sigma_C \rightarrow 0$. Alternatively for G in case C adheres to the cooperative plan, $\bar{U}_G = \frac{(1+V_H)\sigma_G}{1-\delta}$ and $\hat{U}_G = (1 - \rho_S - \sigma_C)(1 + V_H) + \frac{\delta\sigma_G}{1-\delta}$, yielding $\delta_G^* \equiv \frac{(1+V_H)(1-\rho_S-\sigma_G-\sigma_C)}{(1+V_H)(1-\rho_S-\sigma_C)-\sigma_G}$, and $\delta_G^* \rightarrow 1$ as $\sigma_G \rightarrow 0$. ■

Proof of Remark 1: C's Retention Rule. Assume $(1 - \delta)\sigma_G + \sigma_C \leq 1 - \rho_S$. Hold S 's strategy $\{e^t\}$ fixed. Let x^* denote G 's tax rate in extractive equilibrium. Let $\{\hat{x}^t\}_{t=1}^\infty$ denote G 's tax rate in C 's most preferred stationary subgame perfect equilibrium such that $r_C^t = 1$ if and only if $x^t \leq \hat{x}^t$ for all t . Since the loyalty, retention, and investment constraints define a compact set, this equilibrium must exist. Let \hat{U}_C and \hat{U}_G be the continuation values for C and G in this SPE. Moreover, note that if $\{\hat{x}^t\}$ is stationary SPE for G , its continuation strategy must be stationary SPE for G 's replacement if G is ever sacked. Assume $\hat{x}^\tau < x^*$ for some period $t = \tau$, so C demands that G take less than its share in extractive equilibrium at least once.

Suppose G deviates to $\hat{x}^\tau < x^*$ in period τ , and $x^t = \hat{x}^t$ for $t > \tau$. If C sacks G in period τ , C obtains $\sigma_C V + \delta \hat{U}_C$. If C retains G in period τ , C obtains $(1 - \rho_S - x^\tau)V + \delta \hat{U}_C$.

Thus, C prefers $r'_C = 0$ if and only if $\sigma_C \geq 1 - \rho_S - x^r$. But $x^* = 1 - \rho_S - \sigma_C$ (Proposition 2) and $x^* > x^r$ imply $1 - \rho_S - x^r > 1 - \rho_S - x^* = \sigma_C$. Thus, C strictly prefers $r_C = 1$ in a history where the conjectured SPE calls for $r_C = 0$. Therefore, by the one stage deviation principle, there is no stationary SPE in which C sacks for $x > \hat{x}$, for any $\hat{x} < x^*$, in any period t . ■

Proof of Remark 2: Stage Game Sequence. Assume steps 2 and 3 of the stage game are reversed, so that C first takes yV , then G takes $x(1 - y)V$, then C chooses r_C , and then S chooses r_S . Assume $\sigma_C + (1 - \delta)\sigma_G \leq 1 - \rho_S$ (retention constraint). Suppose C chooses $y' \in (\sigma_C, 1 - \rho_S - (1 - \delta)\sigma_G]$ (any smaller y gives C no more utility than in an extractive equilibrium). Suppose G then chooses $x' = 1 - \frac{\rho_S - \varepsilon}{1 - y'}$ for some small ε . Then $(1 - x')(1 - y') = \rho_S - \varepsilon$, so $r_S = 0$ will result from $\{x', y'\}$. Since $(1 - x)(1 - y)$ is continuous and strictly decreasing in y (for $x \in [0, 1]$), there is some $y'' \in (\sigma_C, y')$ such that $(1 - x')(1 - y'') = \rho_S$, so $r_S = 1$, and $u'_C = y''V > \sigma_C V$. If instead C sacks G , $u_C = \sigma_C V$. Thus, given x' , C would rather modify to y'' than sack G . ■

Proof of Remark 3: Sale of Offices. Modify the stage game so that C chooses a price p at the start of each period, G decides whether to pay and take office, and then (if G takes office) play proceeds as before. Assume prices are utility transfers from G to C .

The price p adds a constant to all utilities of player $i \in \{C, G\}$ at any stage terminating node, so it does not affect the relative utilities of any two actions for a given player. Thus, Propositions 1 through 3 hold without modification.

Let $\pi \equiv (1 - \rho_S - \sigma_C - (1 - \delta)\sigma_G)$. Note $\pi \geq 0$ if and only if the retention constraint (Proposition 1) holds. Suppose the investment constraint (Inequality (8)) holds and C charges $p \leq \pi(1 + V_H)$. Then $u_G = xV - p \geq (1 - \delta)\sigma_G V$; $u_C = y(1 - x)V + p \in [\sigma_C V, (\pi + \sigma_C)V]$; and $u_S = \rho_S V$ in extractive equilibrium each period. G will pay at most $\pi(1 + V_H)$ for the office and be retained every period.

Suppose the investment constraint does not hold. If $p > \pi$, then G earns $u_G < 0$. If $p \leq \pi$, then $u_G \geq (1 - \delta)\sigma_G V$, $u_C \in [\sigma_C, (\pi + \sigma_C)]$, and $u_S = \rho_S + V_L$ in extractive equilibrium each period. G will pay at most π and be retained every period.

Note that S 's share of V , and thus e , is invariant to p . ■

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