

NBER WORKING PAPER SERIES

ORGANIZING A KINGDOM

Charles Angelucci  
Simone Meraglia  
Nico Voigtländer

Working Paper 32542  
<http://www.nber.org/papers/w32542>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
June 2024, Revised March 2025

We would like to thank David Austen-Smith, Alberto Bisin, Alessandro Bonatti, Micael Castanheira, Wouter Dessein, James Fenske, Edward Glaeser, Garance Genicot, Robert Gibbons, Avner Greif, Leander Heldring, Alessandro Lizzeri, Chiara Margaria, Omar Moav, Massimo Morelli, Juan Ortner, Nicola Persico, Heikki Rantakari, Michael Ting, Francesco Trebbi, Felipe Valencia Caicedo, Michael Whinston, Leeat Yariv, as well as seminar audiences at Berkeley, Bocconi, Bologna, Bristol, Columbia, Di Tella, Exeter, Harvard, King's College London, MIT Sloan, Monash, San Diego, Stanford, Trinity, Warwick, FRESH 2024, ESAM 2023, the 2023 Utah Winter Organizational and Political Economics Conference, ThReD 2023, and the 2023 IBEO Political Economy Workshop for helpful comments and suggestions. Roi Orzach provided outstanding research assistance. Corresponding author: Nico Voigtlander ([nico.v@ucla.edu](mailto:nico.v@ucla.edu)). The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2024 by Charles Angelucci, Simone Meraglia, and Nico Voigtländer. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Organizing a Kingdom  
Charles Angelucci, Simone Meraglia, and Nico Voigtländer  
NBER Working Paper No. 32542  
June 2024, Revised March 2025  
JEL No. D02, D72, D73, N43, N93, O43

### **ABSTRACT**

We develop a framework to examine the organizational challenges faced by central rulers whose large territories require delegating administrative power to distant rural or urban elites. These elites have distinct policy preferences and vary in their economic importance. The ruler's organizational choices balance a trade-off: allowing elites to adapt to local and common shocks while maintaining coordination across the realm. We show that as urban economic potential grows, the ruler transfers administrative control over towns from landed to urban elites, particularly when all players' preferences are aligned. When towns are administratively autonomous, the ruler summons them to central assemblies to ensure effective communication and coordination. This mechanism can explain how, during the Commercial Revolution, European merchant elites gained nationwide political clout in parliament by first obtaining control over urban administrations. We provide empirical evidence for our core mechanisms and discuss how the model applies to other historical dynamics (ancient Rome and Spanish America), as well as to contemporary organizational problems.

Charles Angelucci  
Applied Economics  
Sloan School of Management  
100 Main Street  
Cambridge, Ma 02142  
cangeluc@mit.edu

Simone Meraglia  
University of Exeter  
Streatham Court  
Exeter  
EX4 4ST, UK  
S.Meraglia@exeter.ac.uk

Nico Voigtländer  
Anderson School of Management  
University of California, Los Angeles  
110 Westwood Plaza  
C513 Entrepreneurs Hall  
Los Angeles, CA 90095  
and NBER  
nico.v@anderson.ucla.edu

A data appendix is available at <http://www.nber.org/data-appendix/w32542>

# 1 Introduction

Ever since the formation of centrally organized polities, competing groups have vied for influence over their economic and political institutions. This contest for power spans from the dominance of military and landed elites in ancient and medieval times, to the rise of merchant elites in the early modern period, and later on, the prominence of financiers and industrialists. A substantial body of research has shed light on the way elites shape institutions (North, Wallis, and Weingast, 2009), and on specific mechanisms through which different groups can gain power, e.g., in response to threats of revolt (Acemoglu and Robinson, 2001), or to address the need to fund public goods (Lizzeri and Persico, 2004).

In this paper, we expand on this literature by examining the challenges faced by a central ruler through an organizational lens. This approach provides a novel rationale to explain how different elites can gain influence over institutions at both local and central levels. We show that as a local elite gains economic importance, the central ruler chooses to delegate administrative control over localities to them – at the expense of competing local elites – provided that their preferences on common policies are sufficiently aligned. Moreover, when a local elite gains administrative control over a locality, the ruler establishes a direct communication channel with them in order to coordinate decision-making. In our model, this takes the form of including the local elite in central assemblies, thus lifting them into the circle of power-holders. These dynamics highlight a novel interaction between local and nationwide institutions.

Our framework captures the institutional evolution of Western Europe during the Commercial Revolution in the 11th-13th century. Limited state capacity forced rulers to delegate administrative control to local elites, who often pursued their own interests (Greif, 2008). The surge in trade potential led central rulers to transfer administrative control over merchant towns from rural to urban elites, effectively separating town jurisdictions from the surrounding countryside (Downing, 1989; Van Zanden, Buringh, and Bosker, 2012). Concomitantly, monarchs reshaped the composition of central assemblies by including representatives from self-governing towns (Angelucci, Meraglia, and Voigtländer, 2022). This process marked the birth of parliaments, a blueprint for Western Europe’s institutional framework that promoted state-formation and economic growth for centuries to come (Acemoglu, Johnson, and Robinson, 2005).

We focus on two key organizational challenges that central rulers faced in governing large territories: adaptation to local conditions and coordination throughout the realm. In our model, a ruler interacts with a rural (landed) elite and an urban (merchant) elite. Each elite makes economic decisions that need to be adapted to a common state (e.g., external war threats), but also to their own local states (e.g., weather shocks in rural areas or trade opportunities for towns). In addition, the elites benefit from coordinating their decisions with each other. For example, merchants and

nearby rural producers may agree on which commodities to specialize in – if sheep herding is important, merchants may want to trade wool. Local administrations can affect these economic decisions through regulations. The ruler must decide whether to delegate control of the urban administration to the landed elite or the urban elite. In making this choice, she takes into account both the economic potential of rural and urban areas, and the weight that the corresponding elites assign to the common state. We assume that the ruler has the strongest interest in the common state, and that the landed elite is naturally more aligned with the ruler’s preferences than the urban elite.<sup>1</sup> The first option is for the landed elite to govern both areas (*Integration*), anticipating they will use control to serve their own interests. For example, the landed elite may impose market regulations to favor local wool trade, even if merchants could profit more from trading silk. The second option is for the ruler to separate jurisdictions, letting each elite govern their own areas (*Separation*). This improves adaptation to local shocks in the urban area, but it reduces coordination across elites.

In addition to deciding on delegation, the ruler must establish effective communication with local elites to coordinate collective action and address external threats. The ruler possesses superior information about the common state, which she communicates through a central assembly by presenting *hard* evidence. In our model, the landed elite always attends the central assembly, while the ruler must decide how to share this information with the urban elite. *Direct* communication with the urban elite in the assembly is costly, requiring the organization of representation and travel to a central location, but it allows the ruler to maintain control over information transmission. An alternative option for the ruler is to exploit a system of *indirect* (sequential) communication, relying on the landed elite to relay *soft* information to the urban elite, such as through local assemblies. While this option is less costly, it poses the risk that the landed elite may manipulate information for their own advantage and hurt overall coordination within the polity.

Our model predicts that growing economic potential of towns can prompt a reorganization of local administrations and communication between center and localities, depending on all players’ preference alignment. Specifically, when towns have a relatively low economic potential, the ruler delegates control of both rural and urban administrations to the landed elite, for any feasible configuration of preferences regarding the common state. This occurs because *Integration* ensures that *i*) policies maximize the ruler’s payoff from the most economically significant area, and *ii*) decision-making better aligns with the ruler’s preferred policies for the common state, given that the landed elite’s preferences are closer to hers. As the economic potential of towns increases, the inefficient regulation under *Integration* creates rising costs for the urban area mostly due to the misadaptation to local conditions. For example, towns may miss out on profits from oriental

---

<sup>1</sup>Historically, the first assumption stems from the fact that central rulers owned land scattered throughout the realm. The second follows from the observation that rulers and landed elites often shared military backgrounds and economic interests, as both were typically large landowners.

spice trade if governed by landed elites favoring rural products. Eventually, the ruler may find it profitable to let the urban elite run the town administration independently (*Separation*). This shift in governance most prominently occurs when *all* players share similar preferences. In this case, *Separation* does not compromise coordination on the common state. By contrast, if the ruler places high weight on the common state relative to both elites, she entrusts administrative control over towns to the landed elite (*Integration*) regardless of towns' economic potential. This reasoning can explain why distant European rulers often concentrated a significant amount of administrative power in their colonies among few elites whose interests were closest to their own (Chiovelli, Fergusson, Martinez, Torres, and Valencia Caicedo, 2023).

Next, we show that a reorganization of the local administrative structure prompts a change in the communication structure between ruler and urban elite. When the ruler delegates control of both rural and urban administrations to the landed elite (*Integration*), she chooses a system of *indirect* communication whereby the landed elite informs the urban elite about the common state. This system is effective because the landed elite regulates the town and has an incentive to relay information accurately: truthful reporting strengthens their control over the urban elite. However, when the ruler delegates control of the urban administrations to the urban elite (*Separation*), *indirect* communication ceases to be reliable. Having lost its administrative control over the town, the landed elite can no longer be trusted to convey accurate information and may, for instance, exaggerate war threats to discourage international trade. To restore effective communication, the ruler establishes a system of *direct* communication with the urban elite by summoning them to the central assembly. As a result of this dual institutional process, the landed elite is forced to accommodate the urban elite's preferences when choosing its own action. In summary, increased urban economic potential leads to administrative autonomy, direct communication with the ruler, and greater influence on policymaking.

In a first extension of our model, we modify the setting so that under *Integration*, the landed elite can only imperfectly influence the urban elite's economic decisions through town regulations. In this case, *indirect* communication no longer guarantees perfect information transmission. We show that compared to this weaker form of *Integration*, *Separation* again strengthens the ruler's incentives to engage in *direct* communication with the urban elite, provided the urban elite places sufficient weight on the common state.

In a second extension, the ruler coordinates an action with the elites but lacks knowledge of local urban conditions. This analysis captures an additional key role of assemblies: facilitating information flow not only from the center to the localities but also in the reverse direction. Our key mechanisms continue to hold: As towns' economic potential grows, they gain administrative autonomy from the landed elite, making *direct* communication with the ruler crucial for her to obtain accurate information about local shocks to towns.

We highlight the relevance of our framework by applying it to diverse historical contexts where rulers faced the challenge of organizing polities that varied in size and heterogeneity of preferences. Our model rationalizes the empirical patterns documented for medieval England by [Angelucci et al. \(2022\)](#), who show that towns located on trade routes (reflecting higher economic potential) were significantly more likely to attain self-governance. This administrative autonomy, in turn, boosted their odds of being summoned to Parliament. We show that, in line with our model, this mechanism was particularly strong for towns that were more closely aligned with the ruler’s preferences. We then discuss our mechanism in the broader context of early modern Western Europe, and we show that our model can also rationalize institutional dynamics in colonial Spanish America and ancient Rome. In the concluding remarks, we discuss insights for the governance structures of contemporary corporations that emerge from novel features of our model.

*[Related Literature.](#)* Our model shows how organizational features – the delegation of decision rights, the choice of communication modes, and their interaction – can shed new light on institutional change. In what follows, we discuss the related literature and highlight our contribution.

We contribute to a nascent literature that introduces insights from organizational economics in the literature on political economy and institutions (see, for instance, [Foarta and Ting, 2023](#); [Snowberg and Ting, 2023](#)). We build upon the models of coordinated-adaptation developed by [Dessein and Santos \(2006\)](#), [Alonso, Dessein, and Matouschek \(2008\)](#) and [Rantakari \(2008\)](#), who study the optimal allocation of decision authority and design of communication structures within multi-divisional firms. Our analysis goes beyond previous models by considering a scenario where (i) the ruler is not a social planner but instead acts in her self-interest – an assumption that reflects the historical context and allows for a richer role played by preferences; (ii) the ruler has private information about the common state; (iii) the ruler can employ alternative modes of communication to share her private information, including sequential ones in which one elite acts as an intermediary; and (iv) local elites make inalienable decisions, meaning that coordination with all is always needed regardless of who controls local administrations. In Section 6, we come full circle by discussing the relevance of our framework to the study of modern organizations.

Our paper relates to several strands of literature in political economy. We contribute to the body of work that looks at the rise of the urban merchant class and the associated Western institutional dynamics. In the context of a city-state, [Puga and Trefler \(2014\)](#) document how international trade led to the ascent to political power of the Venetian merchant class. We study a similar question, but in the context of a large kingdom in which delegation of administrative power and communication between the center and the localities are key. Our emphasis on elites’ local administrative power also connects our work with [Barzel \(1989\)](#), [González de Lara, Greif, and Jha \(2008\)](#), and [Greif \(2008\)](#). [Mayshar, Moav, and Neeman \(2017\)](#) examine the relationship between the center and local elites in the periphery, showing that local elites are empowered by the center’s imperfect informa-

tion about the state of the local agriculture. We contribute by formalizing the interplay between local administrations and ‘nationwide’ institutions such as parliaments. Further, we complement [Acemoglu et al. \(2005\)](#), who find that the extent of merchants’ political power before 1500 mattered in the context of the rise of Atlantic Trade. Our model offers a mechanism whereby merchant elites gain nationwide political clout by first controlling local administrations.

We also contribute to the literature on the role of assemblies in governing polities. In [Levi \(1988\)](#) and [North and Weingast \(1989\)](#), assemblies discipline rulers. In [Myerson \(2008\)](#), assemblies increase rulers’ credibility by exposing them to collective punishments in case of opportunistic behavior.<sup>2</sup> In our setting information sharing in an assembly acts as a mechanism to have local administrations adapt to and coordinate on common goals. Our argument is in line with [Epstein \(2000\)](#), who states that parliaments were created by monarchs to coordinate autonomous jurisdictions.<sup>3</sup> Our approach emphasizes the interdependence between administrative control over localities and membership in central assemblies.

We contribute to the literature on state capacity ([Besley and Persson, 2009, 2010](#); [Johnson and Koyama, 2014](#); [Gennaioli and Voth, 2015](#)), particularly the recent and growing empirical body of work that ‘opens the black box’ of the state by conceptualizing it as an organization (e.g., [Chiovelli et al., 2023](#); [Mastorocco and Teso, 2023](#)). [Chiovelli et al. \(2023\)](#), in the context of colonial Spanish America, show that, in response to a sudden rise in fiscal demands, Madrid undertook significant administrative reforms by consolidating power in the hands of *Intendants* – an elite whose preferences closely matched its own – at the expense of the local Creole elites, whose interests diverged from those of Madrid. In our model, these dynamics reflect an increased emphasis by the ruler on the common state, prompting an administrative shift from *Separation* – where Creoles held significant autonomy – toward *Integration*. This reorganization resulted in policies that benefited the center while undermining the interests of the Creoles. Similarly, studying the organization of the U.S. federal government in the 19th century, [Mastorocco and Teso \(2023\)](#) find that improvements in communication technologies enabled greater delegation of administrative power to lower levels of the bureaucracy. While our model applies to an earlier period that precedes formal bureaucratic apparatuses, it can help to explain this dynamic: Our analysis suggests that as communication costs decrease, decentralizing administrative authority while establishing more direct communication channels can increase efficiency.

Finally, our paper is related to the literature on federalism ([Tiebout, 1956](#); [Oates, 1972](#)), in

---

<sup>2</sup>For a related reasoning, see [Fearon \(2011\)](#).

<sup>3</sup>In this context, our work is further related to a literature that examines the functioning of assemblies and legislatures. In [Weingast and Marshall \(1988\)](#), assemblies enable representatives to bargain over policies. In our model, even though representatives do not hold agenda-setting authority, they accommodate each other to achieve some degree of coordination. We are especially related to the strand of this literature that highlights the importance of information acquisition in legislative committees (see [Gilligan and Krehbiel, 1987, 1989, 1990](#); [Baron, 2000](#); [Dewan, Galeotti, Ghiglino, and Squintani, 2015](#)).

particular the strand that studies the decentralization of government functions (Treisman, 1999; Bardhan and Mookherjee, 2000, 2006). In our setting, centralization is not feasible, and the ruler must rely on local elites. Our work is also connected to the literature on the size of nations (see Alesina and Spolaore, 1997, 2003, for early contributions), even though we take boundaries as given.

The rest of the paper is structured as follows. Section 2 describes the model, followed by its analysis in Section 3 and a discussion of our modeling choices in Section 4. In Section 5, we provide historical evidence for our mechanisms in medieval and early modern Western Europe, as well as in ancient Rome and Spanish America. Section 6 concludes and discusses how our model applies to modern organizations.

## 2 Model

*Players and Actions.* Our model consists of three players: a principal  $P$  and two agents  $A_i$ , where  $i = \{L, T\}$ . Given our primary focus on the medieval European context, we refer to the principal as the ruler (i.e., the monarch), and to the two agents as the landed ( $A_L$ ) and town ( $A_T$ ) elites. Each elite  $A_i$  inhabits the corresponding administrative unit  $D_i$ , with  $D_L$  representing the rural area of a county that is distant from the ruler's location, and  $D_T$ , a town in this county. Each elite chooses an action  $a_i$ , reflecting their own economic activity: For instance, the type of agricultural goods produced for the landed elite and type of goods to trade for the town elite. Moreover, to each administrative unit  $D_i$  corresponds a regulatory decision  $r_i$ , which we interpret as the administration of the unit. For example,  $r_T$  reflects market regulations in towns or adjudication of disputes between merchants.

We assume that  $A_L$  always makes the regulatory decision  $r_L$ . However,  $P$  allocates the right to choose the regulatory decision  $r_T$  to either  $A_L$  or  $A_T$ . In other words, the landed elite maintains control over the rural administration, while the key question is whether this elite also governs the town or whether the town has its own separate administration governed by the town elite.<sup>4</sup> By contrast, the local economic action  $a_i$  is inalienable. For example, town merchants ( $A_T$ ) choose which commodities to trade ( $a_T$ ), and this choice cannot be directly made by landed elites ( $A_L$ ). However, if landed elites are in control of town administration  $r_T$ , they can use this to influence  $A_T$ 's choice of  $a_T$ .

---

<sup>4</sup>Our modeling assumptions exclude the possibility of  $P$  allocating control over both rural and urban administrations to  $A_T$ . This choice simplifies the exposition of our results and reflects historical realities in western Europe, where landed interests largely dominated local administrations throughout most of the Middle Ages. Nevertheless, as we show below, our model provides intuitive conditions under which a town-dominated governance structure could emerge as optimal for the ruler if it were permitted (see Proposition 1 in Section 3.1). In addition, we note that we also ignore the governance structure in which the ruler 'cross-delegates' control over regulatory decisions in the urban area to the rural elite and in the rural area to the urban elite. Our focus centers on a period characterized by administrations led by elites whose authority is based on the control of their own territories, which they leverage to govern immediately-surrounding areas.

Note that our model does not allow  $P$  to directly choose the regulatory decisions in the local units. Historically, territories were typically too large for medieval and early modern rulers to directly govern all areas of the realm. However, we do assume that the ruler can choose *which* local elite is responsible for making administrative decisions in the town, as documented by the rich historical records of royal grants delegating administrative power (see references in [Angelucci et al., 2022](#)).

**Information Structure.** Players care about the realization of three independently distributed states of nature:  $\theta_P$ ,  $\theta_L$ , and  $\theta_T$ , with  $\theta_P \sim U[-\bar{\theta}, \bar{\theta}]$  and  $\theta_i \sim U[-\underline{\theta}, \underline{\theta}]$ , for  $i = \{L, T\}$ . The variable  $\theta_P$  captures the common state of the realm, such as the presence or nature of external threats, which affects each player’s preferred actions. Similarly, the variables  $\theta_L$  and  $\theta_T$  indicate local economic shocks to rural and urban economies, respectively, which also impact players’ preferred actions.

In our core model,  $P$  is privately informed about the realization of  $\theta_P$ , while the realizations of  $\theta_L$  and  $\theta_T$  are publicly observable, i.e., known to  $P$ ,  $A_L$ , and  $A_T$ . This is the simplest case of the organization-communication problem that we analyze. It implies that information flows only top-down, with the ruler informing local elites about  $\theta_P$ . For example, rulers often possessed insider knowledge about war threats due to the intricate networks of the European nobility. In an extension, we also analyze the case where  $\theta_T$  is known to both elites but not to  $P$ , and communication occurs bottom-up (Online Appendix E). Thus, in both the core model and the extension, we maintain the assumption that local elites are aware of each other’s local states, primarily because of their close geographical proximity (i.e., their location in the same county). For example, in 13th century England, county officials in charge of tax collection were local landholders and thus “had personal knowledge of men and conditions [in the localities]” ([Mitchell, 1951](#), pp. 69-70). Finally, we assume  $\underline{\theta} < \bar{\theta}$  (A1), which simplifies our analysis of communication.

**Communication.** We assume that  $P$  always communicates with  $A_L$ . In addition,  $P$  must choose how to communicate with  $A_T$ . One option is for  $P$  to establish a *direct* communication channel with  $A_T$  as well, albeit at a cost. In the historical context, this reflects summoning town elites to parliament, which was costly not only because it required extensive travel, but also because it took time, delaying decision making (see, for instance, [Stasavage, 2011](#); [Mazín, 2013](#)). The alternative option is to use  $A_L$  as an intermediary, and thus communicate with  $A_T$  only indirectly.

$P$  truthfully discloses  $\theta_P$  to the elites she communicates with directly (i.e., she reports *hard* evidence). Parliament was key for the ruler to present evidence on the common state  $\theta_P$  to representatives of the localities, who were assembled “to hear and to do” what was revealed to them by monarch and royal officials ([Mitchell, 1951](#), p. 226). For example, in 1346, a detailed French plan for the invasion of England fell into English hands and was read in parliament ([Harriss, 1975](#), p. 316).<sup>5</sup> This motivates our simplifying assumption that vertical (top-down) communication con-

---

<sup>5</sup>Often, prominent figures like high-ranking officials (for instance, those returning from military campaigns) were

veys verifiable information about  $\theta_P$ , allowing us to focus on analyzing strategic communication between local elites instead.

If  $P$  chooses not to communicate directly with  $A_T$ , she can rely on  $A_L$  to send a costless message  $m_L \in [-\bar{\theta}, \bar{\theta}]$  about  $\theta_P$  to  $A_T$ . We assume that horizontal communication between the two elites is *soft* and thus subject to cheap talk.<sup>6</sup> We refer to an outcome in which  $A_T$  receives information about  $\theta_P$  through  $A_L$  as *indirect* communication between  $P$  and  $A_T$ .

**Governance Structure.**  $P$  chooses the administrative and communication structure of the realm:  $\mathbf{g} = \{R_T, C_T\}$ , where  $R_T \in \{L, T\}$  denotes the identity of the elite (either  $A_L$  or  $A_T$ ) to whom  $P$  delegates decision rights over town regulation  $r_T$ . Further,  $C_T \in \{0, 1\}$  denotes communication: it takes value 1 if  $P$  opens a *direct* communication channel with  $A_T$ . As an illustration, consider  $\mathbf{g} = \{L, 0\}$ . In this configuration,  $A_L$  controls regulation in the town ( $r_T$ ), and  $P$  does not communicate directly with  $A_T$ , relying instead on information transmission through  $A_L$ . A historical example is a medieval English sheriff (who was typically part of the landed elite) being in charge of *i*) the administration of the county (shire), including towns, and *ii*) communication between center and localities via meetings of the county courts.

We define as *Integration* the allocation of decision rights in which  $A_L$  controls regulatory decisions in both units. We define as *Separation* the allocation of decision rights such that  $A_i$  controls  $r_i$ , for  $i \in \{L, T\}$  – that is, each elite chooses the regulatory decision within their own unit. The corresponding historical example is merchant towns obtaining royal grants of self-governance, effectively separating their jurisdiction from the surrounding county and putting the merchant elites in charge of local urban regulations (see Angelucci et al., 2022, and references therein).

**Payoffs.** The ex-post payoff of elite  $A_i$  is given by the following loss function:

$$U_i(\gamma_i) = -k_i \left\{ \underbrace{\frac{1}{2} [\gamma_i \theta_P + (1 - \gamma_i) \theta_i - a_i]^2}_{\text{Adaptation to } A_i\text{'s ideal point}} + \frac{1}{2} \left[ \underbrace{\frac{1}{2} (r_i - a_i)^2}_{\text{Internal Coord.}} + \underbrace{\frac{1}{2} (a_j - a_i)^2}_{\text{External Coord.}} \right] \right\}, \quad (1)$$

where  $k_i \geq 0$  is a measure of unit  $D_i$ 's economic potential. Building on Alonso et al. (2008) and Rantakari (2008),  $A_i$ 's expected loss depends *i*) on the degree of *adaptation*, and *ii*) on both

---

called upon to provide testimony regarding important issues (Harriss, 1975, p. 344).

<sup>6</sup>We assume that  $P$  cannot stop elites from communicating with each other. This captures the fact that local elites could easily communicate due to their close proximity. Moreover, one might question why  $P$  does not share her hard information with  $A_L$ , who could then disclose it to  $A_T$ , bypassing the need for cheap talk. This assumption is justified when considering that, in practice, agents came from many regions scattered across the country to attend parliament, and duplicating hard evidence was not straightforward.

*internal* (intra-units) and *external* (inter-units) *coordination*.<sup>7</sup> In particular, the *adaptation* term captures  $A_i$ 's loss when they are unable to match their economic action to their 'ideal point'  $(1 - \gamma_i) \theta_i + \gamma_i \theta_P$  – a weighted mix of the local state  $\theta_i$  and the common state  $\theta_P$ , where the parameter  $\gamma_i \in [0, 1]$  denotes the weight that  $A_i$  attaches to the common state relative to the local state. This parameter differs across players, as it reflects the extent to which they are affected by shocks to the realm. To illustrate how the local and common shocks affect  $A_i$ 's ideal point, consider the example of the urban elite  $A_T$ . Suppose  $A_T$  chooses how to allocate resources between trading two goods, such as wool and silk, in varying proportions  $a_T$ , (with negative values indicating more wool trade). Here, shocks  $\theta_P = \theta_T = 0$  call for a 'balanced' allocation of resources ( $a_T = 0$ ). When  $\theta_P$  takes a negative value, for instance, this signals that the realm's current state favors a shift toward trading more wool; therefore,  $A_T$  would find it profitable to adjust  $a_T$  downwards to increase wool trade; a negative  $\theta_T$  has a similar effect. On the other hand, a positive  $\theta_P$  or  $\theta_T$  represent conditions that make silk trading more advantageous, leading  $A_T$  to increase  $a_T$ . Thus,  $A_T$ 's ideal action depends on the combined realizations of  $\theta_P$  and  $\theta_T$  and how much weight  $\gamma_T$  is given to each.

Next, *internal coordination* reflects the loss that results if the local economic action  $a_i$  is not aligned with the local regulation  $r_i$ . For example, if market regulation in town ( $r_T$ ) imposes high taxes on silk, then choosing an allocation of resources ( $a_T$ ) that fosters silk trade will imply a larger loss than trading goods with low tax rates (e.g., wool).<sup>8</sup>

Finally, *external coordination* represents the need to coordinate economic activities  $a_i$  and  $a_j$  across units. For example, if the countryside produces wool, then both elites can benefit if the town merchants trade local wool.

---

<sup>7</sup>For simplicity, we assume that the weights given to these various loss terms are equal to each other and identical across players. This approach allows us to focus on the variables of interest – i.e., the economic potential of the two units ( $k_L$  and  $k_T$ ) and players' preferences for the common state ( $\gamma_P$ ,  $\gamma_L$  and  $\gamma_T$ ) – in determining the equilibrium governance structure. Our main result regarding the interaction between the allocation of the decision right over the town's regulatory action ( $r_T$ ) and  $P$ 's choice whether to directly communicate with  $A_T$  does not depend on this particular parameterization. By contrast,  $R$ 's choice between *Integration* and *Separation* may depend on the weights given to the various loss terms, but our results hold for an open set of parameter values and fail to hold only if one considers extreme values of these parameters. For example, if the weight given to internal coordination goes to 1 (e.g., because the ruler cares mostly about preventing urban discontent), then *Separation* always prevails. Computations are available upon request.

<sup>8</sup>Losses from internal miscoordination also capture the social cost of having a community run by outsiders. For example, towns in medieval times frequently complained about the behavior of outside officials (see [Cam, 1963](#); [Carpenter, 1976](#), for the case of medieval England).

$P$ 's ex-post payoff is:

$$U_P(\gamma_P) = - \sum_{i \in \{L, T\}} k_i \left\{ \underbrace{\frac{1}{2} [\gamma_P \theta_P + (1 - \gamma_P) \theta_i - a_i]^2}_{\text{Adaptation to } P\text{'s ideal point}} \right. \\ \left. + \frac{1}{2} \left[ \underbrace{\frac{1}{2} (r_i - a_i)^2}_{\text{Internal Coord.}} + \underbrace{\frac{1}{2} (a_j - a_i)^2}_{\text{External Coord.}} \right] \right\} - F(C_T), \quad (2)$$

where  $\gamma_P \in [0, 1]$  denotes the weight that  $P$  attaches to the common state. Given agents' decisions  $r_i$  and  $a_i$ ,  $P$  internalizes the loss generated by *both* units weighting each by their economic potential,  $k_i$ .  $F(\cdot)$  denotes the fixed cost of setting up a direct communication channel with  $A_T$ , with  $F(1) = f > F(0) = 0$ . For simplicity, the cost of *direct* communication is borne entirely by  $P$ .

Regarding the weights that different players assign to the common state, we make the following assumption:

$$\mathbf{A2:} \quad \gamma_P \geq \gamma_L \geq \gamma_T.$$

**A2** states that, relative to elites' preferences,  $P$  is weakly biased in favor of the common state. This reflects the intuitive idea that rulers assign a greater weight on the common state compared to local actors. **A2** also implies that the landed elite's preferences for the common state align more closely with those of the ruler, as compared to the town elites' preferences. This is motivated by the fact that landed elites were medieval rulers' military force and would thus benefit (or suffer) from wars more immediately than merchants (Harriss, 1975, p. 98).<sup>9</sup> We note that the weights  $\{\gamma_P, \gamma_L, \gamma_T\}$  provide a measure of the degree of homogeneity in players' preferences. Specifically, for any pairwise comparison of players, as the two  $\gamma$ -parameters converge, their ideal points become more similar.

Timing. Players interact for one period. The timing of the game is as follows:

1.  $P$  chooses the governance structure  $\mathbf{g} = \{R_T, C_T\}$ ;
2.  $P$  learns  $\theta_P$ . All players learn  $\{\theta_L, \theta_T\}$ ;
3.  $P$  discloses  $\theta_P$  to  $A_L$ , and also to  $A_T$  if  $C_T = 1$ ;
4. If  $C_T = 0$ ,  $A_L$  sends a message  $m_L$  to  $A_T$ ;
5.  $A_T$  and  $A_L$  simultaneously choose  $\{r_i, a_i\}_{i \in \{L, T\}}$  in accordance with  $\mathbf{g}$ ;
6. Payoffs realize.

---

<sup>9</sup>Of course, merchants could also be influenced by wars, for example if international trade routes were affected. The more important such ramifications were, the closer is  $\gamma_T$  to  $\gamma_L$ .

Our solution concept is Perfect Bayesian Equilibrium. Within this set of equilibria, in the case of *Integration*, we focus on the equilibrium that maximizes the expected payoff of the player who controls both regulatory decisions.<sup>10</sup> Further, in the cheap-talk game, we focus on the most informative equilibria.

### 3 Analysis

To highlight the basic trade-offs between *Integration* and *Separation*, we first analyze the case of complete information in which the common state  $\theta_P$  is publicly observable. Thus,  $P$  allocates regulatory control over the town to either  $A_T$  or  $A_L$ , but she does not need to choose whether to communicate with  $A_T$  – that is,  $\mathbf{g} = R_T$ . This allows us to understand the role played by players' preferences ( $\gamma_P$ ,  $\gamma_L$ , and  $\gamma_T$ ) and units' relative economic potential ( $k_T/k_L$ ) in determining  $P$ 's preferred allocation of regulatory control over the town. We then solve the model of incomplete information and study how the allocation of decision rights over town regulations interacts with the structure of communication between  $P$  and  $A_T$ . In what follows, we normalize  $k_L = 1$  and focus on the comparative statics on  $k_T$ .

#### 3.1 The Game of Complete Information

Suppose  $\theta_P$  is observable to *all* players. We analyze the two possible governance structures, *Integration* and *Separation*, and derive the equilibrium regulatory decisions and economic actions. We then compare  $P$ 's expected payoffs under these two structures.

**Integration.** Suppose  $P$  allocates control over both regulatory decisions  $r_T$  and  $r_L$  to  $A_L$ . Formally,  $P$  sets  $R_T = L$ . Given (1), and ignoring for the moment the choice of  $r_T$ , the three first-order conditions (FOCs) corresponding to the elites' optimization problems are:

$$r_L = a_L, \tag{3}$$

$$a_L = \frac{2}{3} \underbrace{[\gamma_L \theta_P + (1 - \gamma_L) \theta_L]}_{A_L \text{'s ideal point}} + \frac{1}{3} \mathbb{E}_L(a_T), \tag{4}$$

$$a_T = \frac{1}{2} \underbrace{[\gamma_T \theta_P + (1 - \gamma_T) \theta_T]}_{A_T \text{'s ideal point}} + \frac{1}{4} \mathbb{E}_T(a_L) + \frac{1}{4} \mathbb{E}_T(r_T). \tag{5}$$

Equation (3) states that  $A_L$  sets their own unit's regulatory decision equal to their own economic action to ensure perfect internal coordination. Equations (4) and (5) state that each elite sets their economic action to target a convex combination of three elements: *i*) their ideal point; *ii*) their conjecture about the other elite's economic action; and *iii*), for  $A_T$ , their conjecture about the regulatory decision  $r_T$  chosen by  $A_L$ . In addition,  $A_L$  chooses unit  $D_T$ 's regulatory decision  $r_T$ .

---

<sup>10</sup>One microfoundation of this equilibrium under *Integration* is an alternative sequential timing whereby regulatory decisions are taken before elites choose their economic actions.

To solve for all four decisions, we proceed in two steps. First, we solve for the optimal choices of actions  $a_L$  and  $a_T$  by taking  $r_T$  as given. Second, we minimize  $A_L$ 's expected loss in (1) with respect to  $r_T$ , plugging in the solutions for  $a_L$  and  $a_T$ . It follows that, in equilibrium, elites set:

$$r_L = a_L = a_T = (1 - \gamma_L) \theta_L + \gamma_L \theta_P, \quad (6)$$

$$r_T = 3(1 - \gamma_L) \theta_L - 2(1 - \gamma_T) \theta_T + [3\gamma_L - 2\gamma_T] \theta_P. \quad (7)$$

From (6) and (7), we see that  $A_L$  exploit their control over regulatory decisions in both units to achieve perfect *internal* and *external* coordination. Specifically,  $A_L$  designs  $r_T$  to induce  $A_T$  to choose an economic action  $a_T$  that matches  $A_L$ 's ideal point. To achieve this goal, the regulation  $r_T$  puts positive weight on  $\theta_L$ , a weight on  $\theta_P$  that takes into account the difference in  $A_L$  and  $A_T$ 's preferences towards the common state ( $\gamma_L$  and  $\gamma_T$ ), and a negative weight on  $\theta_T$ . By doing so,  $A_L$  obtains the highest possible payoff (i.e., zero loss:  $U_L = 0$ ). Returning to our earlier example, the landed elite can influence the allocation of resources by both elites towards their preferred commodity (e.g., wool) by setting regulations that discourage the trading of the other commodity (e.g., silk). For instance, they could impose taxes, restrictions, or logistical barriers on silk trade.

An *integrated* structure implies perfect internal coordination within unit  $D_L$  and perfect external coordination between the two units around  $A_L$ 's ideal point. *Integration* comes with a loss for  $A_T$ , as their optimal action  $a_T$  differs both from  $A_T$ 's ideal point and from the regulation in their own unit. We report  $P$ 's expected payoff under *Integration* in [Appendix A](#), equation (A.3).

*Separation.* Suppose now that  $P$  lets each elite choose their unit's regulatory decision. Formally,  $P$  sets  $R_T = T$ . The FOCs associated with each elite's problem are:

$$r_i = a_i = \frac{2}{3} (1 - \gamma_i) \theta_i + \frac{2}{3} \gamma_i \theta_P + \frac{1}{3} r_j, \quad (8)$$

for  $i, j = \{L, T\}$ , and  $i \neq j$ . Thus, under *Separation*, both units achieve perfect internal coordination ( $r_i = a_i$ ), that is, each elite chooses a local regulation that does not interfere with their own preferred allocation of resources. Solving for the corresponding system of linear equations leads to the equilibrium decisions:

$$r_i = a_i = \frac{3}{4} (1 - \gamma_i) \theta_i + \frac{1}{4} (1 - \gamma_j) \theta_j + \left[ \frac{3}{4} \gamma_i + \frac{1}{4} \gamma_j \right] \theta_P. \quad (9)$$

These decisions reflect a process of adaptation (of each elite to their own ideal point) and accommodation (to the other elite's ideal point) where the latter ensures some degree of coordination across units (see [Rantakari, 2008](#)). We report  $P$ 's expected payoff under *Separation* in [Appendix A](#), equation (A.4).

*Equilibrium Governance Structure.* Comparing  $P$ 's expected payoffs under the two different governance structures (see (A.3) and (A.4) in Appendix A), it is simple to show that  $P$ 's expected payoff from  $D_L$  is higher under *Integration* than under *Separation*. This is because *Separation* reduces  $P$ 's expected payoff from  $D_L$  due to decreased external coordination and lower adaptation to both the local state  $\theta_L$  and, from  $P$ 's perspective, the common state  $\theta_P$ . Consequently, *Separation* can only be appealing to  $P$  if it increases her expected payoff from unit  $D_T$ , compensating the lower payoff from  $D_L$ . We analyze this trade-off in two steps: We first examine under which configuration of player preferences *Separation* leads to a higher expected payoff (to the ruler) from  $D_T$ . Whether this increased payoff is large enough to compensate the loss from  $D_L$  depends on the relative economic potential of the two units. We analyze this in the second step, introducing the role of  $k_T$ .

Focusing only on the town in our first step, the difference between  $P$ 's expected payoff from  $D_T$  when moving from *Integration* to *Separation* (i.e., subtracting the town-related payoffs in (A.3) from those in (A.4)) is:

$$\underbrace{\frac{\theta^2}{3}}_{\text{Var Local State}} \times \underbrace{\left\{ (1 - \gamma_P)^2 - \left[ 1 - \gamma_P - \frac{3}{4}(1 - \gamma_T) \right]^2 + \frac{45}{16}(1 - \gamma_L)^2 + \frac{15}{8}(1 - \gamma_T)^2 \right\}}_{\text{Local-State Component}} + \quad (10)$$

$$+ \underbrace{\frac{\bar{\theta}^2}{3}}_{\text{Var Common State}} \times \underbrace{\left\{ (\gamma_P - \gamma_L)^2 - \left( \gamma_P - \frac{1}{4}\gamma_L - \frac{3}{4}\gamma_T \right)^2 + \frac{15}{8}(\gamma_L - \gamma_T)^2 \right\}}_{\text{Common-State Component}} \lesseqgtr 0.$$

$P$  may experience either an improvement or a reduction in her expected payoff from  $D_T$  when separating the town administration. Under *Separation*, all actions better target the local state  $\theta_T$ , resulting in an unequivocal improvement of the component of  $P$ 's payoff tied to  $D_T$ 's local state ('local-state component'), which is the part in (10) that is multiplied by the variance of the local states  $\theta_i$ . By contrast, the effect of *Separation* on the component of  $P$ 's payoff tied to the common state ('common-state component') is a priori ambiguous. On the one hand, *Separation* eliminates any loss associated with uncertainty about  $\theta_P$  that arises from the internal coordination channel within  $D_T$ . On the other hand, because  $A_T$ 's preferences for the common state are (weakly) more distant from  $P$ 's than  $A_L$ 's preferences (see A2), from  $P$ 's perspective, *Separation* (weakly) undermines  $P$ 's expected payoff from the remaining channels – i.e., adaptation to and external coordination on  $\theta_P$ . The 'common-state component' is the second part of (10), which is multiplied by the variance of  $\theta_P$ .<sup>11</sup>

<sup>11</sup>The first two terms of the 'common-state component' in (10) capture the difference in  $P$ 's payoff due to adaptation to the common state when moving from *Integration* to *Separation*. From A2, this difference is weakly negative, with equality holding when  $\gamma_L = \gamma_T$ . The last term of the 'common-state component' reflects the difference between the payoffs related to external coordination under *Separation* and internal coordination under *Integration*. This difference

In our first step we analyze these forces with a simple sign condition: Because *Separation* leads to an improvement in  $P$ 's expected payoff through the 'local-state component,' it also increases  $P$ 's overall expected payoff from  $D_T$  if the 'common-state component' is non-negative. Lemma 1 identifies two *sufficient* (but not *necessary*) conditions on players' preferences under which the 'common-state component' takes non-negative values.

**Lemma 1.** *There exist two individually sufficient (but not necessary) conditions for  $P$ 's expected payoff from unit  $D_T$  to be (weakly) higher under Separation than under Integration. The first sufficient condition is:*

$$\gamma_L = \gamma_T . \quad (11)$$

*The second sufficient condition is (for  $\gamma_L > \gamma_T$ ):*

$$\gamma_P \leq \frac{15\gamma_L - 7\gamma_T}{8} \equiv \underline{\gamma} . \quad (12)$$

*Proof.* See [Appendix A](#). □

The lemma establishes that  $P$  expects a higher payoff from the urban area under *Separation* when: a) elites exhibit perfectly homogeneous preferences over the common state, (condition (11) in the lemma), or b)  $P$  does not assign exceedingly high importance  $\gamma_P$  to the common state (condition (12) in the lemma). The intuition for a) is that, when elites' preferences are perfectly homogeneous (i.e.,  $\gamma_L = \gamma_T$ ), equilibrium decisions weigh the common state identically under both *Integration* and *Separation*. In this scenario,  $P$  expects a higher payoff from  $D_T$  under *Separation*,  $\forall \gamma_P$ , as this governance structure enables her to capture the benefits tied to the 'local-state component' of her payoff, while not incurring any losses through the 'common-state component' (which is zero in (10) if  $\gamma_L = \gamma_T$ ). The intuition for b) is that, when  $\gamma_P$  is low (while the elites' preferences are heterogeneous), the adaptation of the town to  $\theta_P$  is less of a concern to the ruler.<sup>12</sup> Thus, the ruler becomes more inclined to delegate control of the urban economy to  $A_T$ , despite the fact that town preferences for the common state are less closely aligned with her own.<sup>13</sup> Conversely, when  $\gamma_P$  is high – violating (12) –  $P$  becomes more likely to delegate control of the urban economy to

---

is weakly positive, with equality also holding when  $\gamma_L = \gamma_T$ . Intuitively, under *Integration*,  $A_L$  can compel  $A_T$  to perfectly target  $A_L$ 's preferred policy, which creates a relatively large internal coordination loss in  $D_T$  when  $\gamma_L > \gamma_T$ . In contrast, under *Separation*,  $A_L$  can only partially influence  $A_T$ 's economic decisions toward  $A_L$ 's preferred policy, resulting in a relatively moderate external coordination loss in  $D_T$ . Thus, *Separation* leads to a net increase in the part of  $P$ 's payoff that is related to these terms.

<sup>12</sup>More precisely, among the elements of the 'common-state component,' the loss from reduced adaptation to and external coordination on  $\theta_P$  under *Separation* weighs less to the ruler than the improved internal coordination of the town, ensuring that the 'common-state component' is non-negative.

<sup>13</sup>Note that if the two elites attach *very* different weights to the common state,  $\underline{\gamma}$  can exceed 1, so that (12) always holds. Intuitively, having  $A_L$  impose  $r_T$  on a town with vastly different preferences would create so much internal coordination loss associated to  $\theta_P$  that *Separation* becomes appealing to the ruler, no matter how much weight  $\gamma_P$  she puts on the town's adaption to the common state. This particular case is empirically less relevant in our analysis.

$A_L$  to promote greater adaptation to and (external) coordination on the common state, which she then values highly. As we discuss in Section 5, this comparative statics result provides insights into the administrative reforms in 18th-century Spanish America, where colonial urban elites had previously enjoyed a degree of administrative autonomy. The need to finance wars against major European powers increased the Spanish crown’s  $\gamma_P$ , which led it to effectively revoke this autonomy by transferring administrative control to agents whose preferences were more closely aligned with its own (Chiovelli et al., 2023).

Figure 1 illustrates the range of  $\gamma_L$  and  $\gamma_T$  values where conditions (11) and (12) are satisfied for our baseline value of  $\gamma_P = 0.9$ .<sup>14</sup> Given **A2**, the relevant area lies (weakly) below the 45° line. The 45° line itself is determined by condition (11), while the triangular blue area on the right side of the graph represents the region where condition (12) holds.

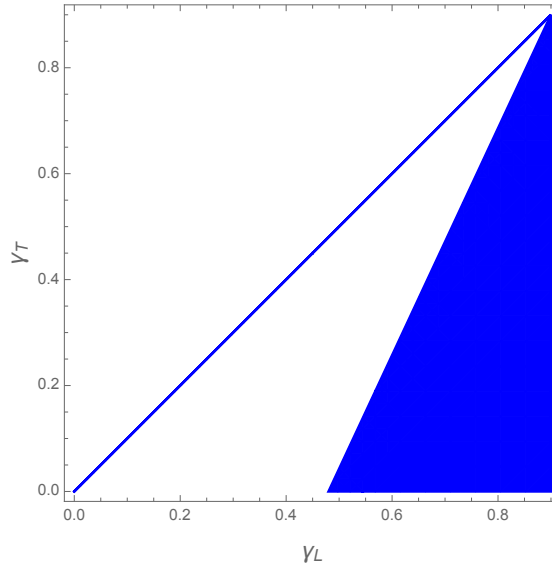


Figure 1: Illustration of Lemma 1

*Note:* The figure shows in blue – the 45° line and the blue triangle – the range of values for elites’ preferences  $\{\gamma_L, \gamma_T\}$ , where  $\gamma_L \geq \gamma_T$ , that satisfy the conditions in Lemma 1, using our baseline value for  $\gamma_P = 0.9$ . The figure focuses exclusively on the urban unit  $D_T$ . See the text for further details.

To sum up, when condition (11) or (12) hold, moving from *Integration* to *Separation* implies that  $P$  obtains a higher expected payoff from the urban area  $D_T$ . However, the conditions in Lemma 1 are sufficient but not necessary:  $P$  might also expect a higher payoff from  $D_T$  under *Separation* when neither (11) nor (12) hold, i.e., when the ‘common-state component’ is negative. From (10), this is the case when the ‘local-state component’ is sufficiently large to outweigh the

<sup>14</sup>We set the baseline value of  $\gamma_P$  to ensure that there exists a non-empty set of  $\gamma_L$  and  $\gamma_T$  values for which  $P$  never chooses *Separation*, even as the town’s economic potential rises (see footnote 15 for detail). This choice deliberately stacks the odds against our main results in Proposition 1 and Corollary 1.

‘common state component’ (both weighted by the respective variances). Specifically, this condition is met when the difference in payoffs given by (10) is (weakly) positive. The following proposition builds on this intuition and extends the analysis initiated in Lemma 1 by fully accounting for the magnitudes of both the ‘local-state component’ and the ‘common-state component,’ as well as the associated variances.

**Proposition 1.** *P’s expected payoff from the urban area  $D_T$  is (weakly) higher under Separation than under Integration in the following two (not mutually exclusive) scenarios:*

- a) *The two elites have relatively similar preferences about the common state: for some  $\delta \geq 0$ ,  $(\gamma_L - \gamma_T) \leq \delta$ ;*
- b) *The two elites have different preferences and the ruler puts a relatively low weight on the common state: for some  $\eta \geq 0$ ,  $\gamma_P \leq \underline{\gamma} + \eta$ , with  $\underline{\gamma}$  defined in Lemma 1.*

*Finally, all else equal, the thresholds  $\delta$  and  $\eta$  are increasing in the variance of the local states and decreasing in the variance of the common state.*

*Proof.* See Appendix A. □

The intuition for parts a) and b) in Proposition 1 is the same as described for the respective parts of Lemma 1, augmented by the role of the ‘local-state component’ (which always favors *Separation*) and the variances of the local and common states (whose role we discuss below). Proposition 1 expands the parameter space from Lemma 1 where *Separation* yields a higher expected payoff from the urban area for the ruler. This is illustrated in Figure 2, which fixes the values of  $\gamma_P$ ,  $\text{Var}(\theta_i)$ , and  $\text{Var}(\theta_P)$ , and shows the range of  $\gamma_L$  and  $\gamma_T$  values (depicted in blue) where  $P$ ’s expected payoff from  $D_T$  is higher under *Separation* than under *Integration*. Throughout we use the value of  $\underline{\theta} = \sqrt{3}$ , so that  $\text{Var}(\theta_i) = 1$ . For the remaining parameters, Figure 2a uses the baseline value for  $\gamma_P = 0.9$ , as in Figure 1, together with a baseline value for  $\bar{\theta} = 5\sqrt{3}$ , resulting in a baseline variance of the common state equal to 25.<sup>15</sup>

Compared to Figure 1, incorporating the magnitudes of both the ‘local-state component’ and the ‘common-state component,’ each weighted by the variances of local and common states, widens the regions near the 45° line (part a in Proposition 1) and adjacent to the triangular blue region in Figure 1 (part b in Proposition 1). Figure 2b highlights the role played by the variances as stated in Proposition 1: Increasing the variance of the common state above its baseline value reduces the area where *Separation* yields a higher payoff from the town. Intuitively, if  $\text{Var}(\theta_P)$  is large relative to  $\text{Var}(\theta_i)$  the ruler’s central aim is to have all decisions conform to the common

<sup>15</sup>The high baseline value for  $\text{Var}(\theta_P)$  ensures that there exists a non-empty set of values for  $\gamma_L$  and  $\gamma_T$  where *Separation* yields a lower expected payoff for  $P$  from the urban unit  $D_T$ . As noted in footnote 14, this choice stacks the odds against our main result in Corollary 1.

state – as the common state holds paramount importance relative to the local states. This priority leads her to favor the landed elite (i.e., *Integration*), whose preferences are closer to her own.<sup>16</sup> Figures 2c and 2d show that the same reasoning applies for a different value of  $\gamma_P$ . Furthermore, consistent with part b) of Proposition 1, the comparison between Figures 2a and 2c (and between Figures 2b and 2d) illustrates that the range where *Separation* yields a higher expected payoff becomes progressively larger as  $\gamma_P$  decreases.<sup>17</sup> In addition, note that in all four panels of Figure 2 the area in the top right corner is blue: This is where  $\gamma_L$  and  $\gamma_T$  are similar and high (i.e., close to  $\gamma_P$ ). Thus, *Separation* of towns tends to be beneficial to the ruler when all players share similar preferences. We will test this prediction in our empirical section.

Having established the configuration of players' preferences under which *Separation* leads to a higher expected payoff for the ruler from the urban unit, our final step introduces also the payoff from the rural unit, together with the relative economic potential of the town,  $k_T$ . This is formalized in the following corollary to Proposition 1.

**Corollary 1.** *If condition a) and/or condition b) in Proposition 1 is satisfied, there exists a threshold  $\underline{k}$  such that  $P$  chooses *Integration* when  $k_T < \underline{k}$  and *Separation* when  $k_T \geq \underline{k}$ . If neither condition a) nor condition b) holds,  $P$  chooses *Integration* for all  $k_T$ .*

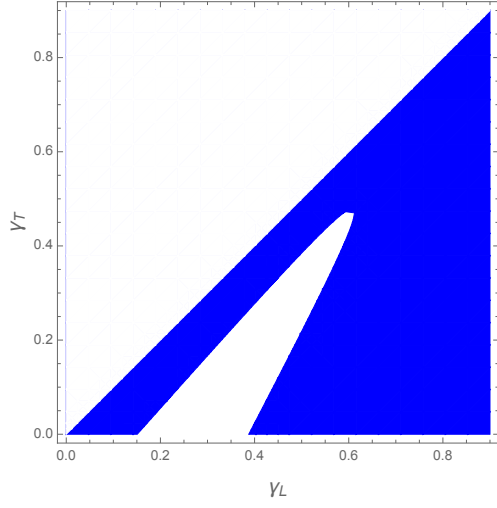
Given the variances of the local and common states, when the configuration of players' preferences allows the ruler to expect a higher payoff from the urban area under *Separation* than under *Integration*, her choice between these two governance structures depends on the economic potential of the town relative to that of the rural area. By transferring decision-making from the landed elite to the town elite, *Separation* favors the urban unit at the expense of the payoff that  $P$  expects from the rural area. This trade-off explains why the ruler grants *Separation* when, all else equal,  $k_T$  is sufficiently large.

In the context of our historical application, this result captures the wave of self-governance monarchs granted to merchant towns throughout Western Europe following the Commercial Revolution. Specifically, the Commercial Revolution led to an increase in the economic potential of trading towns ( $k_T$ ), shifting the ruler's preference toward delegating the administration of urban areas to the merchant elite, whose interests catered more to the needs of the growing urban economy.

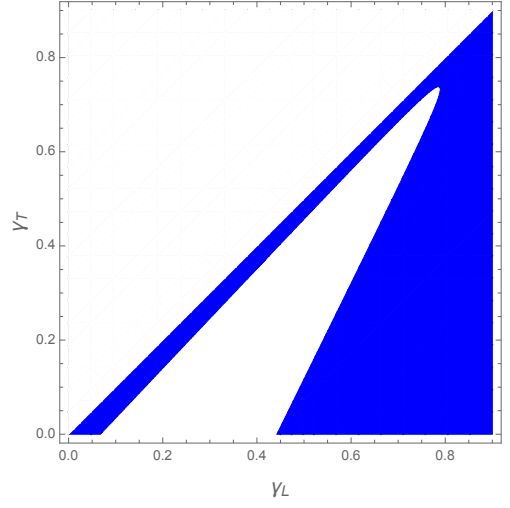
Figure 3 illustrates the trade-off between *Integration* and *Separation* by plotting the ruler's expected losses for a configuration of players' preferences under which a threshold  $\underline{k}$  exists (case

<sup>16</sup>Conversely (not depicted in the figures), when the variance of the common state is held constant, increasing the variance of the local state gradually expands the range of  $\gamma_L$  and  $\gamma_T$  values for which *Separation* yields a higher expected payoff from unit  $D_T$ . For sufficiently high values of the variance of the local state, this range eventually encompasses the entire region beneath the 45° line, including the line itself.

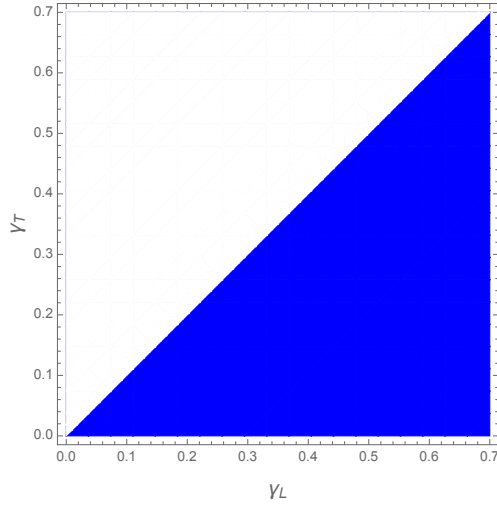
<sup>17</sup>This holds even when accounting for the change in the scale of the axes (which have to be adjusted because of A2).



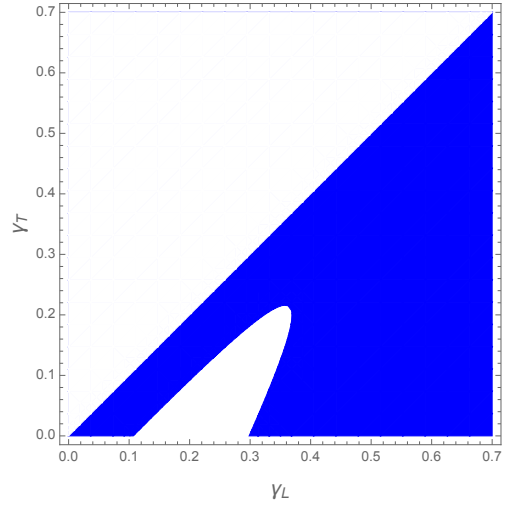
(a) Baseline  $\gamma_P$  and baseline  $\text{Var}(\theta_P)$



(b) Baseline  $\gamma_P$  and high  $\text{Var}(\theta_P)$



(c) Low  $\gamma_P$  and baseline  $\text{Var}(\theta_P)$



(d) Low  $\gamma_P$  and high  $\text{Var}(\theta_P)$

Figure 2: Illustrating Proposition 1

*Note:* The figure shows in blue the range of values for elites' preferences  $\{\gamma_L, \gamma_T\}$ , where  $\gamma_L \geq \gamma_T$ , that satisfy Proposition 1, i.e., where *Separation* benefits ruler's expected payoff from the urban unit  $D_T$ . Baseline (resp., low) value of  $\gamma_P$  corresponds to  $\gamma_P = 0.9$  (resp.,  $\gamma_P = 0.7$ ). Similarly, baseline (resp., high) value of variance of the common state corresponds to  $\theta = 5\sqrt{3}$  (resp.,  $\theta = 10\sqrt{3}$ ). The value of  $\underline{\theta}$  is fixed at  $\sqrt{3}$ , implying that the variance of the local state is equal to 1 in all panels.

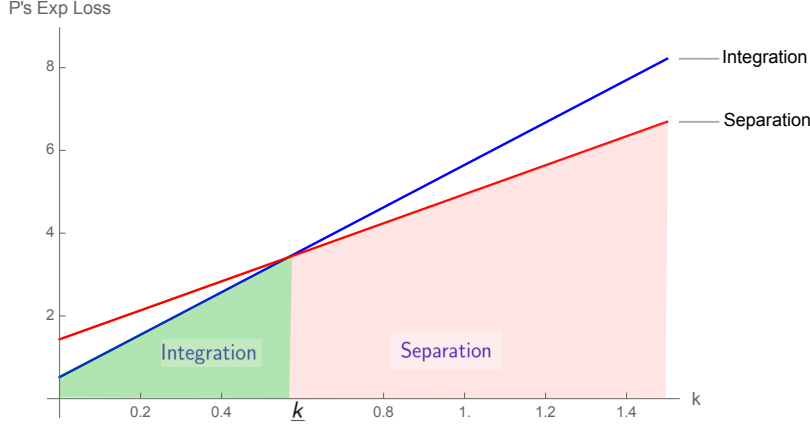


Figure 3: Integration vs. Separation and the Economic Potential of the Town

*Note:* The figure illustrates the ruler's expected losses under *Integration* and *Separation* as a function of  $k_T$  (the economic potential of the town), where  $k$  is defined as  $\frac{k_T}{k_L}$ , with  $k_L$  normalized to 1. The figure shows that the ruler's expected loss is lower under *Integration* for low values of  $k_T$ , while *Separation* is optimal when  $k_T$  exceeds  $\underline{k}$ . Parameters values in the figure are  $\gamma_L = 0.7$  and  $\gamma_T = 0.3$ . The remaining parameters are our baseline values.

$b$  in Proposition 1). Figure 4 complements Figure 3 by illustrating how the range of values for  $\gamma_L$  and  $\gamma_T$  under which  $P$  prefers *Separation* increases as  $k_T$  grows. This highlights a key interaction between preferences and economic potential: As  $k_T$  increases, the ruler may choose *Separation* even if even town elites put significantly lower weight on the common state ( $\gamma_T < \gamma_L$ ), as indicated by the larger area (in red) below the diagonal in Figure 4b.

In Section 5, we examine the predictions regarding *i*) the role of  $k_T$  and *ii*) the role of preferences using data on medieval English towns' trade potential and municipal liberties.

### 3.2 The Game of Incomplete Information

In this section, we examine the game in which  $P$  has private information about the common state  $\theta_P$ . In this case, the allocation of regulatory decision rights interacts with the choice of the communication structure between the ruler and the urban elite. We show that the trade-offs between *Separation* and *Integration* shown in Section 3 carry over to the case of incomplete information, and we explore its consequences regarding the ruler's decision of whether to communicate directly about  $\theta_P$  with  $A_T$ .

For both *Integration* and *Separation*, we distinguish between two possible communication structures between  $P$  and  $A_T$ : *i*) *direct* communication (i.e.,  $C_T = 1$ ), and *ii*) *indirect* communication, in which  $A_L$  (who always learns about  $\theta_P$ ) informs  $A_T$  about the common state (i.e.,  $C_T = 0$ ).

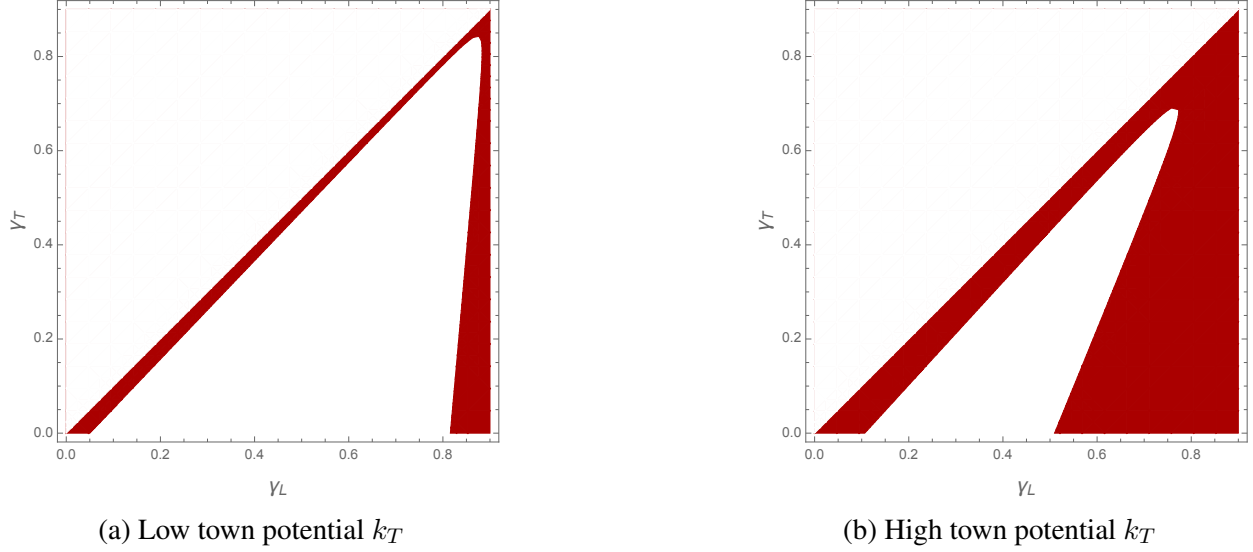


Figure 4: Interplay of Elite Preferences and Economic Potential

*Note:* The figure shows in red the range of values for elites' preferences  $\{\gamma_L, \gamma_T\}$ , where  $\gamma_L \geq \gamma_T$ , such that  $P$  prefers *Separation* to *Integration*, taking into account  $P$ 's expected payoff from both units  $D_L$  and  $D_T$ . Panel (a) uses  $k_T = 0.2$ , while panel (b) uses  $k_T = 1.2$ , where  $k_L = 1$  for both panels. The remaining parameters for both panels are our baseline values.

### 3.2.1 Integration

Mirroring the complete information analysis, we first consider the case in which  $P$  allocates control over both units' regulatory decisions to  $A_L$ , that is,  $P$  chooses  $R_T = L$ . Under *Integration*, the benefit that the landed elite draws from being able to influence the urban elite depends on what the latter know about the common state  $\theta_P$ .

**Direct Communication.** Suppose  $P$  communicates directly with  $A_T$ , i.e.,  $P$  sets  $\mathbf{g} = \{L, 1\}$ . Both elites are perfectly informed about the realization of  $\theta_P$  because  $P$  discloses verifiable information. Except for the cost of communication, this scenario is identical to the game of complete information. The actions chosen by the elites are given by (6) and (7), and  $P$ 's expected payoff is given by (A.3) in Appendix A, subtracting the cost of communication  $f$ .

**Indirect Communication.** Suppose that  $P$  discloses the value of  $\theta_P$  to  $A_L$ , who then sends a message  $m_L$  about  $\theta_P$  to  $A_T$ . Formally,  $P$  sets  $\mathbf{g} = \{L, 0\}$ . We first show that when  $A_L$  is in charge of both regulatory decisions, they will truthfully communicate  $\theta_P$  to  $A_T$  (i.e.,  $m_L = \theta_P$ ). To see this, suppose that communication between  $A_L$  and  $A_T$  has already taken place and note that the FOCs corresponding to the elites' optimization problems are:

$$r_L = a_L = \frac{2}{3} [(1 - \gamma_L) \theta_L + \gamma_L \theta_P] + \frac{1}{3} \mathbb{E}_L(a_T), \quad (13)$$

$$a_T = \frac{1}{2} [(1 - \gamma_T) \theta_T + \gamma_T \mathbb{E}_T(\theta_P | m_L)] + \frac{1}{4} \mathbb{E}_T(r_T | m_L) + \frac{1}{4} \mathbb{E}_T(a_L | m_L), \quad (14)$$

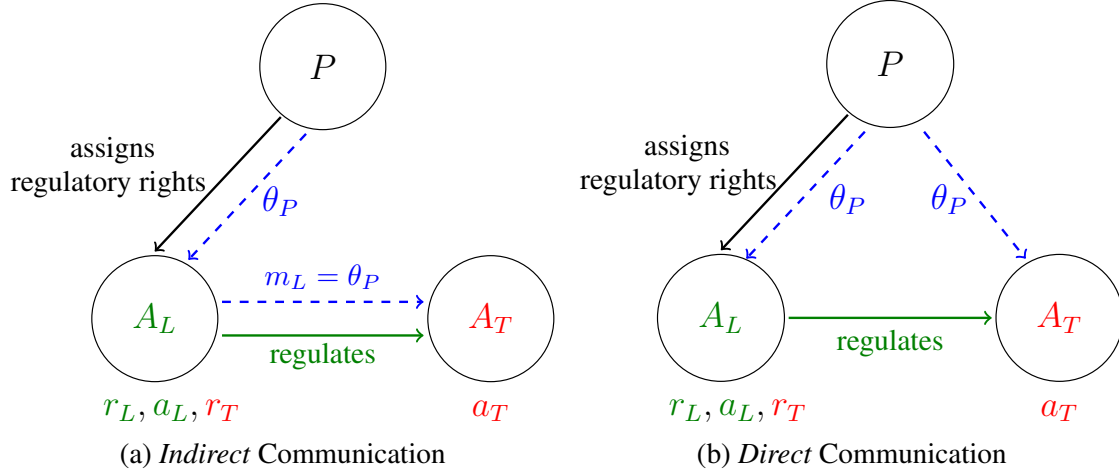


Figure 5: *Integration*: Landed Elite Runs both Rural and Urban Administrations

*Note:* The figure depicts the two possible communication structures when the landed elite controls both the rural and the urban areas. In Figure (a), the ruler discloses the common state  $\theta_P$  to the landed elite  $A_L$  who, in turn, communicates  $\theta_P$  truthfully to the urban elite  $A_T$ . In Figure (b), the ruler discloses the common state  $\theta_P$  to both the rural elite and the urban elite.

where  $\mathbb{E}_T(\cdot \mid m_L)$  captures  $A_T$ 's beliefs following the message  $m_L$  received from  $A_L$ . Moreover,  $A_L$  sets  $r_T$  so that  $A_T$  chooses  $a_T$  as close as possible to  $a_L$ .<sup>18</sup> If  $m_L = \theta_P$ , then the optimal actions are given by (6) and (7), which give  $A_L$  the highest possible payoff (i.e., zero loss). The following lemma formally states that  $A_L$  truthfully communicates  $\theta_P$  to  $A_T$  in equilibrium.

**Lemma 2.** *Suppose  $P$  chooses *Integration*. Following communication between  $P$  and  $A_L$ , in the most informative equilibrium of the cheap-talk game between  $A_L$  and  $A_T$ ,  $A_L$  truthfully reveals  $\theta_P$  to  $A_T$ .*

*Proof.* The proof follows from (6) and (7), and by noting that  $A_L$  achieve their highest payoff ( $U_L = 0$ ) by truthfully revealing  $\theta_P$ .  $\square$

Intuitively, by truthfully communicating the common state to  $A_T$ ,  $A_L$  can better exploit their control over town regulation to *fully* steer  $A_T$ 's economic action towards  $A_L$ 's own ideal point. Having established that communication between  $A_L$  and  $A_T$  is truthful, we can compute  $P$ 's expected payoff (see (A.3) in Appendix A). Figure 5 summarizes the case of *Integration* by illustrating the nature of information transmission from the ruler to the elites under the two possible communication structures.

*Equilibrium under Integration.* From the analysis of communication under *Integration*, the following result holds:

<sup>18</sup>Exactly as in the game of complete information,  $A_L$  achieves this by choosing a decision  $r_T$  that puts appropriate weights on  $\theta_T$ ,  $\theta_L$ , and  $\theta_P$ .

**Lemma 3.** *Under Integration,  $P$  chooses  $C_T = 0$  ('indirect' communication).*

*Proof.* See [Appendix A](#). □

Intuitively, because  $A_L$  can be trusted to convey information truthfully to  $A_T$ ,  $P$  chooses *indirect* communication to economize on communication costs.

### 3.2.2 Separation

Suppose  $P$  allocates control over regulatory decision  $r_T$  to  $A_T$ . Formally,  $R_T = T$ . Compared to *Integration*,  $A_L$  can no longer manipulate  $r_T$  to influence  $A_T$ 's economic action  $a_T$ . Instead, the two elites must find a balance between adapting to their ideal points and accommodating each other's preferences for local and common states to achieve a degree of coordination. The elites' ability to achieve their objectives depends on their information about  $\theta_P$ . Let  $\mathbb{E}_i(\theta_P)$  denote  $A_i$ 's expected value of  $\theta_P$ . Under *Separation*, the FOCs corresponding to  $A_i$ 's optimization problem are:

$$r_i = a_i = \frac{2}{3} [(1 - \gamma_i) \theta_i + \gamma_i \mathbb{E}_i(\theta_P)] + \frac{1}{3} \mathbb{E}_i(a_j), \quad (15)$$

for  $i, j \in \{L, T\}$  and  $i \neq j$ . As in the game of complete information, both elites achieve perfect internal coordination by optimally setting their regulatory decisions and economic actions equal to each other. We again distinguish two communication scenarios.

**Direct Communication.** Suppose  $\mathbf{g} = \{T, 1\}$ , that is,  $P$  communicates directly with both elites. Except for the cost of communicating, this scenario is identical to the game of complete information because we assume that  $P$  discloses verifiable information about  $\theta_P$ . The choices made by the elites are given by (9).  $P$ 's expected payoff is stated in [Appendix A](#), equation (A.4) after subtracting the cost of communication  $f$ .

**Indirect Communication.** Suppose  $\mathbf{g} = \{T, 0\}$ , that is,  $P$  discloses the value of  $\theta_P$  to  $A_L$ , who then sends a message  $m_L$  about  $\theta_P$  to  $A_T$ . From (15), because  $\mathbb{E}_L(\theta_P) = \theta_P$ , the FOCs corresponding to the elites' optimization problems are given by:

$$r_L = a_L = \frac{3}{4} (1 - \gamma_L) \theta_L + \frac{1}{4} (1 - \gamma_T) \theta_T \quad (16)$$

$$+ \frac{2}{3} \gamma_L \theta_P + \left[ \frac{\gamma_T}{4} + \frac{\gamma_L}{12} \right] \mathbb{E}_T(\theta_P | m_L),$$

$$r_T = a_T = \frac{3}{4} (1 - \gamma_T) \theta_T + \frac{1}{4} (1 - \gamma_L) \theta_L \quad (17)$$

$$+ \left[ \frac{3}{4} \gamma_T + \frac{1}{4} \gamma_L \right] \mathbb{E}_T(\theta_P | m_L),$$

where  $\mathbb{E}_T(\cdot | m_L)$  captures  $A_T$ 's beliefs following the message  $m_L$  received from  $A_L$ .

To compute  $P$ 's expected payoff, we first solve for the equilibrium of the cheap-talk game between elites that occurs in stage 4. The following lemma states its main feature.

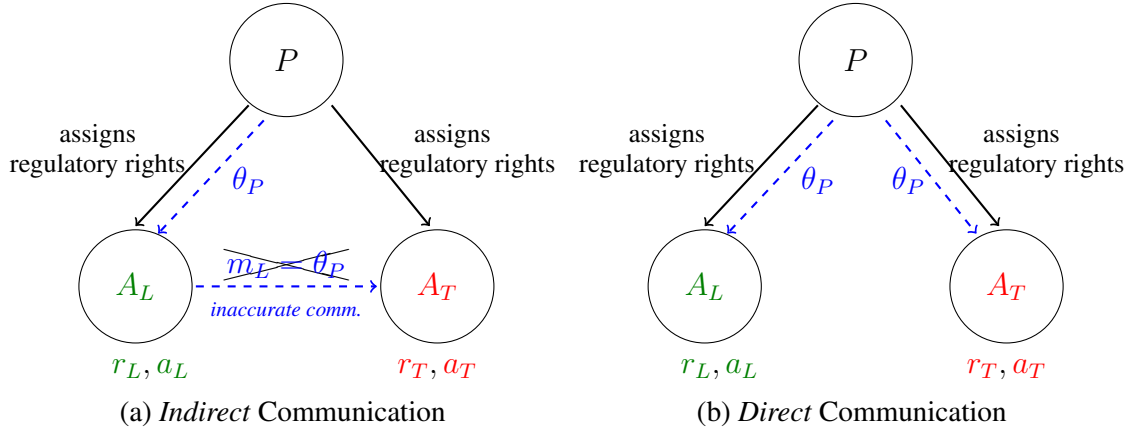


Figure 6: *Separation: Each Elite Runs their own Administration*

*Note:* The figure depicts the two possible equilibrium communication structures when each elite runs their unit's local administration. In Figure (a), the ruler discloses the common state  $\theta_P$  to the landed elite  $A_L$  who, in turn, imperfectly communicates  $\theta_P$  to the urban elite  $A_T$ . In Figure (b), the ruler discloses the common state  $\theta_P$  to both the rural elite and the urban elite.

**Lemma 4.** *Under Separation and ‘indirect’ communication – i.e.,  $\mathbf{g} = \{T, 0\}$  – there does not exist an equilibrium in which  $A_L$  truthfully reveals  $\theta_P$  to  $A_T$ .*

*Proof.* See [Appendix A](#). □

As elites face different local conditions (i.e.,  $\theta_L \neq \theta_T$ ) and assign different weights to the common state (i.e.,  $\gamma_L \neq \gamma_T$ ),  $A_L$  has an incentive to misrepresent the value of  $\theta_P$  in order to induce  $A_T$  to select an economic action that better aligns with  $A_L$ 's own ideal point. Accordingly, and as can be derived using the expressions provided in the proof, the quality of communication improves (but never reaches perfection) as  $\gamma_T$  tends to  $\gamma_L$ .

Figure 6 illustrates the two possible communication structures under *Separation*. Returning to our historical example, in which the landed elite favors wool production while the urban elite prefers silk trade, we can grasp the differences in the landed elite's incentives to relay information under *Integration* and *Separation*. Under *Integration*, the landed elite controls town regulations, enabling it to steer the town's economic action toward wool trade. By truthfully revealing the realization of the common shock, the landed elite allows the urban elite to perfectly anticipate forthcoming regulations in the town. However, under *Separation*, the landed elite loses this regulatory leverage. Consequently, the landed elite has an incentive to distort information about the common shock, so as to indirectly influence the urban elite's actions.

*Equilibrium under Separation.* We compute  $P$ 's expected payoff under *indirect* communication in [Appendix B](#), showing that – ignoring the cost of communication – imperfect communication between the elites is detrimental to  $P$  compared to the case where  $A_T$  knows  $\theta_P$ . Whether the ruler

chooses *direct* communication then depends on its cost relative to the benefit that it provides for  $P$ . This leads to the following lemma.

**Lemma 5.** *Under Separation, there exists a threshold  $\underline{f}$  for the cost of ‘direct’ communication between  $P$  and  $A_T$  such that:*

- i) *if  $f \leq \underline{f}$ ,  $P$  chooses  $C_T = 1$  (‘direct’ communication),  $\forall k_T$ ;*
- ii) *if  $f > \underline{f}$ ,  $P$  chooses  $C_T = 0$  (‘indirect’ communication), for  $k_T \in [0, \hat{k})$  and  $C_T = 1$  (‘direct’ communication), for  $k_T \geq \hat{k}$ ,*

where  $\hat{k}(f, \cdot)$  is increasing in  $f$ .

*Proof.* See [Appendix A](#). □

When the cost  $f$  of establishing a *direct* communication channel with  $A_T$  is low (part i in the lemma),  $P$  gains from disclosing  $\theta_P$  directly to  $A_T$  rather than choosing *indirect* communication via  $A_L$ . Direct disclosure prevents  $A_L$  from manipulating information, which can lead to both elites adapting poorly to the common state and failing to coordinate effectively. Part ii) establishes that the ruler may opt for *direct* communication even if it is relatively costly ( $f > \underline{f}$ ), provided that the expected benefit from improved information provision outweighs the cost of communication. Because inaccurate information reduces  $P$ ’s expected payoff from the urban area, this choice is made when the size of the urban economy,  $k_T$ , is (weakly) greater than the threshold  $\hat{k}$ .

### 3.2.3 Equilibrium Governance Structure

We now study  $P$ ’s preferred allocation of administrative control *and* communication structure for different configurations of parameters. To limit the number of cases to consider, we perform this comparison for low communication costs  $f$ . Specifically, we assume  $f = \epsilon$ , with  $\epsilon > 0$  as small as one likes (A3). Under A3, there exists a large scope for communication. This approach simplifies the analysis and is sufficient to establish our main result of interest.<sup>19</sup> The following proposition states our main result.

**Proposition 2.** *Suppose the cost of ‘direct’ communication is negligible (but strictly positive). If condition a) and/or b) in Proposition 1 are satisfied, there exists a threshold  $\tilde{k}$  for  $k_T$  such that  $P$  chooses Integration with ‘indirect’ communication for  $k_T \in [0, \tilde{k})$  and Separation with ‘direct’ communication for  $k_T \geq \tilde{k}$ .*

*If neither condition a) nor b) in Proposition 1 holds,  $P$  chooses Integration with ‘indirect’ communication for all  $k_T$ .*

---

<sup>19</sup>For a full characterization of the equilibrium governance structure when  $f$  can take any positive value, see Online Appendix B.

*Proof.* See [Appendix A](#). □

Proposition 2 characterizes the equilibrium allocation of decision rights over urban regulatory actions and the associated communication structure as a function of *i*) the relative potential of the urban economy and *ii*) the degree of alignment in players' preferences. To build the core intuition, Proposition 2 focuses on the case with low cost of *direct* communication between  $P$  and  $A_T$ . However, our results also hold more generally under higher costs of communication.<sup>20</sup> Proposition 2 establishes that, under incomplete information, a change in the allocation of decision rights triggers an adjustment in the communication structure: Under *Integration*,  $P$  relies on a system of *indirect* communication to convey *perfect* information about  $\theta_P$  via  $A_L$  to  $A_T$ . In contrast, under *Separation*,  $P$  engages in *direct* communication with both elites to prevent  $A_L$  from manipulating information. The shift in decision rights allocation, transitioning from *Integration* to *Separation*, and the alteration in the communication structure between the ruler and the urban elite, moving from *indirect* to *direct* communication, reinforce each other and result in *all* actions assigning more weight to the preferences of the urban elite. Figure 7 illustrates these trade-offs by comparing the ruler's expected losses under *Integration* and *Separation*, with further distinction between *indirect* and *direct* communication in the *Separation* scenario.

The result stated in Proposition 2 captures the significant shift in the composition of medieval and early modern parliaments that occurred throughout Western Europe. Following the Commercial Revolution, merchant towns obtained self-governance, and therefore had to be persuaded into choosing an allocation of resources that better targeted the realization of the common shock (e.g., moving resources towards food supply for soldiers). As highlighted by [Harriss \(1975, pp. 41-2\)](#), in England the traditional assembly of landed elites saw a diminishing influence over the decision-making processes of these towns, prompting the monarch into initiating *direct* communication with urban representatives in parliament. We further discuss these institutional dynamics in Section 5.

## 4 Discussion of Modeling Choices and Extensions

In this section, we evaluate our core modeling choices (presented in Sections 2 and 3) vis-à-vis alternative approaches.

*Information about local states.* In our baseline setup, complete information about local states allows us to focus on top-down ruler-elite communication regarding the common state. In Online Appendix E, we explore an alternative scenario where assemblies serve as bottom-up information-gathering forums for rulers. This modified setup makes the common state and rural conditions

---

<sup>20</sup>Proposition B.1 in Online Appendix B extends the analysis of Proposition 2 to scenarios where the communication cost  $f$  can take any positive value. Our findings confirm that the core results of Proposition 2 remain robust under these general conditions. However, for very high costs of *direct* communication, we also identify an intermediate range of  $k_T$  values where  $P$  chooses *Separation* with *indirect* communication.

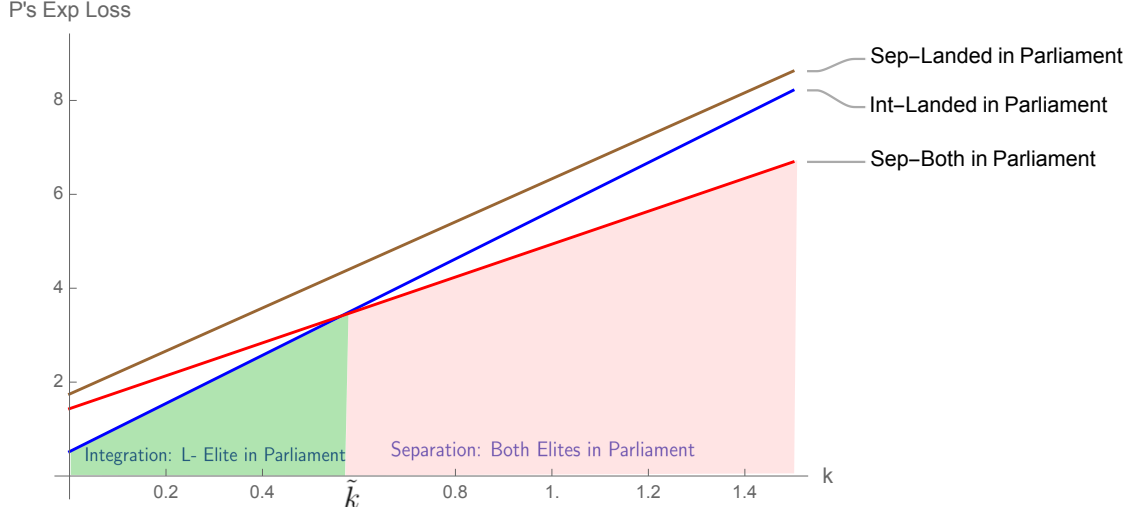


Figure 7: Governance Structure and the Economic Potential of the Town

*Note:* The figure illustrates the ruler's expected losses under *Integration* and *Separation* as a function of  $k_T$ , where  $k$  is defined as  $\frac{k_T}{k_L}$ , with  $k_L$  normalized to 1. The figure shows part *a* in Proposition 2: As  $k_T$  grows sufficiently large, the ruler transitions from *Integration* with *indirect* communication to *Separation* with *direct* communication with both elites. Parameters' values in the figure are  $\gamma_L = 0.7$ ,  $\gamma_T = 0.3$ , and  $f = 0$ . The remaining parameters are our baseline values.

public, while the town's state is known only to urban and landed elites. We introduce a ruler's action requiring coordination with elites' decisions and allow the ruler to choose between learning town conditions via landed or urban elites. As in the main analysis, we find that as towns gain importance, they achieve self-governance and are summoned to assemblies, as landed elites become unreliable intermediaries.

Our core model assumes that local elites know each other's states due to geographical proximity and can communicate without cost. Alternatively, we could have considered distant elites privately informed about their local conditions, communicating with each other (and the ruler) at a cost within a central assembly. In this scenario, the ruler would risk elites coordinating on local states instead of the common state when assembled (see [Hernández, 2020](#), pp. 356-8). As a consequence, the ruler may prefer a system of bilateral *direct* communication with each elite rather than collective communication in an assembly.

*Asymmetries between elites.* We assumed that *i*) the landed elite always controls the administration of the rural area, and *ii*) the ruler always discloses  $\theta_P$  to the landed elite. These assumptions streamline the analysis by limiting the number of cases to consider, allowing us to focus on the process by which towns obtain municipal autonomy and representation in parliament. A more general setup where rural areas can also be controlled by towns, and where the ruler has to choose whether to communicate with rural areas, does not alter our main results. In this more general

setup, if the town’s economic potential significantly exceeds that of the rural area, an inverse pattern, with the town governing the surrounding countryside and being the only elite in direct communication with the ruler, can emerge.

*Incentives to learn the common state.* We assume that the cost of communication is entirely borne by  $P$ , and elites have no choice but to listen to  $P$ . Alternatively, we could have assumed that elites also bear a cost from listening to  $P$ , allowing them to choose whether to remain ignorant about the realization of the common state by deciding not to incur this cost. In this context, it can be shown that an elite has a stronger incentive to engage in communication with  $P$  when they control the administration of their area. Specifically,  $A_T$  benefits more from learning  $\theta_P$  under *Separation* than under *Integration*. This difference arises because  $A_T$  can more effectively exploit information to target their own ideal point under *Separation*. Online Appendix C offers a more detailed discussion.

*Imperfect control under Integration.* In our baseline setup, under *Integration*, the landed elite can fully and costlessly influence urban regulations, ensuring that the urban elite adopts an economic action that perfectly matches the landed elite’s preferred policy. In Online Appendix D, we relax this assumption by allowing the landed elite to exert only imperfect control over urban regulations under *Integration*. In this modified setting, our main results remain robust while offering additional insights that we discuss in Online Appendix D.

*Voting.* In our model, the assembly serves as a forum for players to exchange information. Its function is deliberative, meaning that it does not reach a binding decision through mechanisms such as majority voting. This matches significant historical examples, like medieval and early modern parliaments that coordinated efforts by localities to meet war threats (see, for instance, Mitchell, 1951, p. 226). It also corresponds to modern organizational settings, such as inter-divisional meetings where headquarters and divisional leaders communicate to coordinate decision-making in response to changes in their environment.

*Monetary transfers.* Another feature of our model is the lack of monetary transfers and the consequent inability of the players to enter contracts with each other. This assumption captures the idea that it is difficult to enforce complex contracts that would make the institutional setup irrelevant (see Acemoglu, 2003). However, the economic actions made by the elites in our model can be interpreted as the allocation of resources, including money, to different goals, such as contributing to war efforts or improving local infrastructure.

## 5 Historical Applications

Our framework sheds light on the emergence of urban self-governance, whereby urban elites obtained administrative control over towns and representation in central assemblies, ultimately shifting the balance of powers. These dynamics played out in different historical contexts. In this

section, we first discuss Western Europe and present empirical evidence for medieval England, focusing on the rise of the merchant class and the creation of parliaments. We then move on to the cases of Spanish America and ancient Rome.

## 5.1 Western Europe and Empirical Evidence for England

In the medieval period, before the Commercial Revolution, control over rural and urban areas across Western Europe rested largely with (military) landed elites. These elites assumed positions as county officials, wielding extensive jurisdictional authority over towns and their merchant elites.<sup>21</sup> Central assemblies typically included landed elites, while sidelining merchants. Landed elites were key in facilitating administrative coordination across the realm: They disseminated information about the policies agreed upon in the assembly to towns and reported on local conditions to the monarch. Information dissemination through landed elites was possible because they were in frequent contact with towns, performing various local administrative tasks such as tax collection and handling contractual disputes in county courts (see [Harding, 1973](#); [Maddicott, 1978](#), for the case of England).<sup>22</sup> According to our model (Lemma 2), this system was effective because the landed elite could influence merchant decisions through regulations and did not have to fall back on biased communication.

The Commercial Revolution significantly boosted the economic potential of trading towns. From the 12th century, central rulers granted merchant elites administrative autonomy in exchange for higher taxes, which were offset by increased urban efficiency ([Ballard and Tait, 1923](#); [Kiser and Barzel, 1991](#)). The wave of municipal autonomy weakened the influence of landed elites over municipal governance and consequently their ability to influence towns' decisions. Through the lens of our model (Lemma 4), landed elites thus had incentives to manipulate town decisions by distorting information, which they passed on in county courts. The historical evidence is consistent with this mechanism: In England, the Crown no longer required autonomous towns to attend county courts to conduct administrative business and exchange information, establishing instead direct communication channels with urban elites ([Mitchell, 1951](#); [Carpenter, 1996](#)). In our model's logic, mediation by the landed elite was abandoned because they could no longer be trusted to act as reliable information intermediaries between the center and towns.<sup>23</sup> By the 13th century, central

---

<sup>21</sup>For England, see [Mitchell \(1951\)](#). For France and Spain, see [Sanz \(1994\)](#), [Ladero Quesada \(1994\)](#), and [Hilton \(1995\)](#).

<sup>22</sup>In the words of [Maddicott \(1978, pp. 33-35\)](#), "By tradition the county court was the place for the publication of charters of liberties, new statutes and ordinances, routine administrative decrees, and many *ad hoc* announcements which often had a bearing on national politics. It was by proclamations that men became aware of events at Westminster and that public opinion could be most effectively shaped in response to the government's needs. As in the sixteenth century, they provided the shires with orders, information and the official view. [...] The instructions to the sheriff which prefaced a proclamation normally ordered its publication 'in your full county court and in cities, boroughs, market towns and other places where you shall see fit; [...].'"

<sup>23</sup>In the broader context of county and borough administrations, [White \(1933, pp. 89, 93, and 103\)](#) highlights that, beginning with Henry II in the late 12th century, English monarchs distrusted sheriffs when it came to i) carrying out

rulers across Western Europe included representatives of autonomous towns in regional and central assemblies, providing urban elites with voice and ears on matters concerning the entire polity (Marongiu, 1968). These changes influenced economic and institutional dynamics for centuries inside and outside Western Europe – such as the financing of colonial enterprises, trade policies, and the gradual extension of the franchise and introduction of checks and balances on the executive (Acemoglu et al., 2005; Angelucci et al., 2022).

*Empirical Evidence for England:* In what follows, we confront some of the core mechanisms in our model with historical data. We leverage the dataset assembled by Angelucci et al. (2022) for England after the Norman Conquest in 1066 and examine the period of the Commercial Revolution until the Black Death in 1348. We focus on the 141 towns in the royal demesne of England, where the crown had direct decision power over self-governance – specifically, the power to grant townsmen the right to elect the entire body of municipal officials with judicial and fiscal prerogatives.<sup>24</sup> These royal boroughs were relatively evenly distributed throughout England (see Figure 1 in Angelucci et al., 2022).

We begin with the prediction from Proposition 1 and Corollary 1 that rising economic potential of towns (high  $k_T$ ) leads to administrative separation, i.e., urban self-governance. We use exposure to trade as a proxy for towns’ economic potential during the Commercial Revolution. Those are towns located on the sea coast, on a navigable river, or on an ancient Roman road (which regained importance when trade expanded after the Dark Ages). In accordance with Angelucci et al. (2022), Panel A in Figure 8 shows that our model prediction is strongly borne out in the data: Trade towns were about three times more likely to receive self-governance before 1348 than other royal towns, and this difference is statistically highly significant. Table S.1 in the Online Appendix shows that this result is not driven by regional patterns (it holds with county fixed effects) or by the wealth of towns (we control for taxable wealth from the Domesday Book).

Next, we test another feature of our model: Propositions 1 and 2 highlight how the preferences of ruler and elites influence whether towns obtain self-governance. In particular, towns whose preferences were closely aligned with the landed elite and with the crown should have been more prone to receive self-governance. As a proxy for the alignment of preferences we use an indirect measure: Whether a town received a Murage grant from the crown by 1348. These grants gave towns the right to collect taxes to maintain city walls – a crucial feature in defending the realm. Murage grants were therefore typically bestowed upon towns situated near the Welsh and Scottish

---

certain local administrative duties and ii) accurately conveying information between the center and localities. This distrust stemmed from the fact that sheriffs were significant landholders with personal interests that could bias their actions.

<sup>24</sup>We deliberately exclude mesne towns from our discussion and analysis. Because these were under the direct control of (mesne) lords, the king could not grant them self-governance rights. For a detailed historical discussion, see Angelucci et al. (2022).

borders. Because walls could ultimately insulate towns from royal power, Murage grants were a sign that the crown trusted these towns not to abuse their empowered position. In the words of [Turner \(1971, p. 16\)](#), “The relations between Town [receiving a Murage grant] and Crown were good, and co-operation close.” In addition, landed elites in border regions were also closely aligned with the ruler, as they were the first to fight when wars broke out.<sup>25</sup> Panel B in Figure 8 shows that, indeed, Murage towns were much more likely to receive self-governance, confirming our model prediction. Table S.1 in the Online Appendix shows that these results hold when we control for regional patterns, for wealth, and when we restrict the sample to towns close to the Scottish or Welsh border.

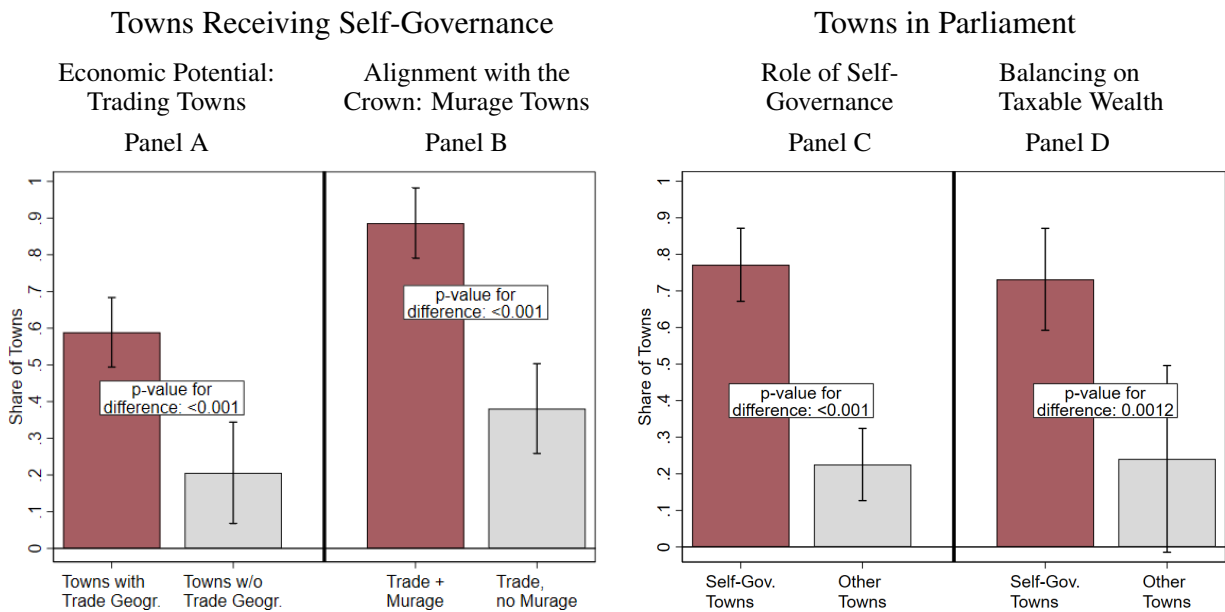


Figure 8: Testing Model Predictions in Medieval England

*Note:* The figure illustrates that central predictions of our model hold in the data for medieval England. Panel A shows that towns with trade geography (located on the sea coast, a navigable river, or an ancient Roman road) were significantly more likely to receive self-governance. Panel B shows that the same is true for towns whose preferences were more aligned with the crown (as proxied by Murage grants – the rights to repair and maintain city walls, which was crucial for defense). Panel C provides evidence for the prediction that self-governing towns will be summoned to Parliament for direct communication with the Crown. Panel D shows that this holds also when balancing the sample with respect to town-level taxable wealth from the Domesday Book in 1086. Tables S.1 and S.2 in the Online Appendix provide robustness checks of these results.

We now turn to Proposition 2: That self-governing towns will be summoned to Parliament for direct communication with the ruler. Reflecting the findings of [Angelucci et al. \(2022\)](#), Panel C in

<sup>25</sup>The office of sheriff in border regions was typically held by landed elites with military backgrounds – whose preferences closely matched those of the crown and who were therefore trusted by the monarch to prioritize the realm’s defense, as evidenced by their control of strategic royal castles (see the *Calendar of Patent Rolls*, as cited by [Reid, 1917](#)).

Figure 8 shows that 77% of self-governing towns were represented in Parliament by 1348, as compared to only 22% of all other royal towns. A possible concern is that economic importance may have led directly to both self-governance and representation in Parliament.<sup>26</sup> Panel D addresses this concern by balancing towns with and without self-governance in terms of their taxable wealth in 1086.<sup>27</sup> The relationship between self-governance and representation in Parliament is equally strong in the balanced sample, implying that towns' wealth (or bargaining power) are unlikely to confound our results. Table S.2 provides additional specifications and robustness checks.

Overall, the historical record for England strongly supports the key mechanisms in our model. We now discuss qualitative evidence for similar dynamics in other historical settings.

## 5.2 Qualitative Evidence for Mechanisms in other Regions

*Spanish America:* Our analysis also applies to 16-18C Spanish America. In Appendix F.2, we provide detail for our prediction on the role of towns' economic potential: In line with our model, when profits from colonial trade grew in the 16th and 17th centuries, local (*creole*) elites gained administrative power (*Separation*) at the expense of provincial-level Spanish officials, and they also began to communicate directly with the crown.

However, this administrative structure was reversed in the latter half of the 18th century due to a shift in the Spanish crown's priorities. As studied by Chiovelli et al. (2023), rising fiscal pressures from wars against European powers led the Bourbon monarchs to seek increased contributions to the war effort from their colonial territories. In our model's terms, the crown's weight on the common state  $\gamma_P$  increased, leading to a divergence in policy preferences from those of the *creole* elites, who put less weight on funding the crown's distant wars. Proposition 1 predicts that this would favor *Integration*, i.e., a concentration of administrative power in the hands of a more loyal elite. Accordingly, the Spanish crown initiated reforms that replaced the local (*creole*) elites with a new corps of Spanish-born provincial governors (*intendants*) whose preferences were more closely aligned with its own (Fisher, 1928). This shift prioritized policy coordination to fund external wars, sacrificing the ability of local *creole* elites to shape policies in their own interests, including their control over the indigenous population. As a consequence, the reforms met with resistance from the *creole* elites – a process that arguably prompted the formation of independence movements, as highlighted by Chiovelli et al. (2023).

*Ancient Rome:* A further application of our model is the organization of Roman provinces. As

---

<sup>26</sup>For example, one may worry that economically more important towns bought or demanded seats – although this contradicts the historical record, as representation in Parliament became desirable for English towns after 1500 (Pasquet, 1964; Angelucci et al., 2022). We also note that, consistent with our reasoning, 54 of the 58 self-governing royal boroughs in Parliament gained self-governance first. The remaining four are excluded from the analysis.

<sup>27</sup>We use entropy balancing, which creates balanced samples by reweighing the observations without self-governance to match the mean and variance of taxable wealth in royal towns with self-governance. Taxable wealth is from the Domesday Book. See Angelucci et al. (2022) for data sources.

the Roman dominion expanded across Europe, it introduced a relatively homogeneous administrative structure, partitioning newly acquired territories into provinces ruled by centrally appointed officials.<sup>28</sup> Before the 2nd century BC, tax collection in provincial towns was primarily handled by outsiders (*publicani*), while local urban elites had limited influence over town administrations. Direct communication between provincial urban elites and Rome was infrequent, with indirect communication through provincial assemblies likely playing a more significant role.<sup>29</sup> During the 2nd and 1st centuries BC, as provincial towns grew economically vital (France, 2021, pp. 232-3), Rome restructured local governance, granting urban elites administrative control over selected towns. In line with our framework, these changes aimed to empower towns to adapt to local contingencies and curb discontent. However, the increased self-governance exacerbated coordination challenges, prompting Rome to establish direct ties with autonomous urban elites (see Fernoux, 2019; France, 2021, pp. 327-9, 375-6). This policy was implemented by increasing towns' participation in provincial assemblies and allowing them to send representatives to Rome, enhancing their influence over policies (France, 2021, pp. 401-2).

## 6 Conclusion

Over six decades after James March (1962) encouraged applying political science frameworks to firms, our paper takes a reverse approach. Anchored in organizational economics and the literature on multi-divisional firms, our model incorporates key elements to analyze the organizational challenges of historical central states. In the spirit of March's call, our framework is also relevant to the study of modern organizations. In our model, elites make inalienable decisions affecting the whole polity. For instance, urban elites make decisions on commerce even if they do not run town administrations, contrasting with the usual assumption of fully transferable decision rights in the literature on multi-divisional firms. Our approach also applies to corporate settings: While an engineering division might hold sway over product design, the decisions in the product design team remain essential for the company overall. Our model shows that such interactions are important in determining the organizational structure, including whether engineering should indeed control product design, or whether the latter should become a separate division within the firm.

Our model also emphasizes the role of the communication network among all players, including indirect communication. It explores whether an elite should directly interact with a central authority, or communicate via another elite, balancing factors such as communication costs and the reliability of intermediaries. This parallels modern organizations contemplating executive team

---

<sup>28</sup>For the organization of the provinces see the contributions in Barrandon and Kirbihler (2019) and France (2021, pp. 105-9, 119-20, 151-5, 327-8).

<sup>29</sup>Instances of direct communication between Rome and delegates of provincial towns often revolved around grievances pertaining to the conduct of tax farmers. Little information survived about the participation of towns in provincial assemblies under the jurisdiction of centrally-appointed magistrates (France, 2021, pp. 133-4, 142-3, 279-81, 290-8).

composition. For the specific example above, our model suggests that if product design gains autonomy, it should be directly represented in the executive team to prevent information distortion by other divisions seeking to manipulate product design decisions in their favor.

Lastly, our model emphasizes the role of preference heterogeneity, in line with [Cyert and March \(1963\)](#) who state that “our impression is that most actual managers devote much more time and energy to the problems of managing their [internal] coalition than they do to the problems of dealing with the outside world” (as cited by [Gibbons, 2023](#)). While models typically focus on headquarters’ prioritization of divisions based on their importance, we add another layer: the central authority considers variations in preferences among herself and elites when designing the administrative structure. Likewise, in firms, the CEO and divisional leaders frequently hold contrasting perspectives. In this context, adapting our approach of modeling coalition dynamics to the study of corporate organizational design promises novel insights.

## References

- Acemoglu, D. (2003). Why Not a Political Coase Theorem? Social Conflict, Commitment, and Politics. *Journal of Comparative Economics* 31(4), 620–652.
- Acemoglu, D., S. Johnson, and J. A. Robinson (2005). The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth. *American Economic Review* 95(3), 546–579.
- Acemoglu, D. and J. A. Robinson (2001). A Theory of Political Transitions. *American Economic Review*, 938–963.
- Alesina, A. and E. Spolaore (1997, 11). On the Number and Size of Nations. *The Quarterly Journal of Economics* 112(4), 1027–1056.
- Alesina, A. and E. Spolaore (2003, 11). *The Size of Nations*. The MIT Press.
- Alonso, R., W. Dessein, and N. Matouschek (2008). When Does Coordination Require Centralization? *American Economic Review* 98(1), 145–79.
- Angelucci, C., S. Meraglia, and N. Voigtländer (2022). How Merchant Towns Shaped Parliaments: From the Norman Conquest of England to the Great Reform Act. *American Economic Review* 112(10), 3441–87.
- Ballard, A. and J. Tait (1923). *British Borough Charters 1216–1307* (1st ed.). Cambridge University Press.
- Bardhan, P. K. and D. Mookherjee (2000, May). Capture and governance at local and national levels. *American Economic Review* 90(2), 135–139.
- Bardhan, P. K. and D. Mookherjee (2006). Decentralisation and accountability in infrastructure delivery in developing countries\*. *The Economic Journal* 116(508), 101–127.
- Baron, D. P. (2000). Legislative Organization with Informational Committees. *American Journal of Political Science* 44, 485–505.

- Barrandon, N. and F. Kirbihler (Eds.) (2019). *Les Gouverneurs et les Provinciaux sous la République Romaine*. Presses Universitaires de Rennes.
- Barzel, Y. (1989). *Economic Analysis of Property Rights*. Cambridge University Press.
- Besley, T. and T. Persson (2009, September). The origins of state capacity: Property rights, taxation, and politics. *American Economic Review* 99(4), 1218–44.
- Besley, T. and T. Persson (2010). State capacity, conflict, and development. *Econometrica* 78(1), 1–34.
- Cam, H. M. (1963). *Liberties & Communities in Medieval England: Collected Studies in Local Administration and Topography* (1st ed.). London: Merlin Press.
- Carpenter, D. A. (1976). The Decline of the Curial Sheriff in England 1194–1258. *English Historical Review* 91(358), 1–32.
- Carpenter, D. A. (1996). *The Reign of Henry III*. A&C Black.
- Chiovelli, G., L. Fergusson, L. Martinez, J. D. Torres, and F. Valencia Caicedo (2023, August). Bourbon Reforms and State Capacity in the Spanish Empire. *Available at SSRN*.
- Cyert, R. M. and J. G. March (1963). *A Behavioral Theory of the Firm*. Prentice Hall/Pearson Education.
- Dessein, W. and T. Santos (2006). Adaptive Organizations. *Journal of Political Economy* 114(5), 956–995.
- Dewan, T., A. Galeotti, C. Ghiglino, and F. Squintani (2015). Information Aggregation and Optimal Structure of the Executive. *American Journal of Political Science* 59(2), 475–494.
- Downing, B. M. (1989). Medieval Origins of Constitutional Government in the West. *Theory and society* 18(2), 213–247.
- Epstein, L. (2000). *Freedom and Growth: The Rise of States and Markets in Europe, 1300-1750*. London: Routledge.
- Fearon, J. D. (2011). Self-enforcing Democracy. *The Quarterly Journal of Economics* 126(4), 1661–1708.
- Fernoux, H.-L. (2019). Les Ambassades Civiques des Cités de la Province d’Asie Envoyées à Rome au I<sup>er</sup> s. av. J.-C. : Législation Romaine et Prérogatives des Cités. In N. Barrandon and F. Kirbihler (Eds.), *Les Gouverneurs et les Provinciaux sous la République Romaine*, pp. 77–99. Presses Universitaires de Rennes.
- Fisher, L. E. (1928). The Intendant System in Spanish America. *The Hispanic American Historical Review* 8(1), 3–13.
- Foarta, D. and M. Ting (2023). Organizational capacity and project dynamics. *Stanford University Graduate School of Business Research Paper No. 4321890*. George J. Stigler Center for the Study of the Economy the State Working Paper No. 339.
- France, J. (2021). *Tribut: Une Histoire Fiscale de la Conquête Romaine*. Les Belles Lettres.
- Gennaioli, N. and H.-J. Voth (2015). State Capacity and Military Conflict. *Review of Economic Stud-*

- ies 82(4), 1409–1448.
- Gibbons, R. (2023, May). From Coase to Culture: Visible Hands Build Equilibria. Technical report, MIT.
- Gilligan, T. W. and K. Krehbiel (1987, 10). Collective Decisionmaking and Standing Committees: An Informational Rationale for Restrictive Amendment Procedures. *The Journal of Law, Economics, and Organization* 3(2), 287–335.
- Gilligan, T. W. and K. Krehbiel (1989). Asymmetric Information and Legislative Rules with a Heterogeneous Committee. *American Journal of Political Science* 33, 459–490.
- Gilligan, T. W. and K. Krehbiel (1990). Organization of Informative Committees by a Rational Legislature. *American Journal of Political Science* 34, 531–564.
- González de Lara, Y., A. Greif, and S. Jha (2008). The Administrative Foundations of Self-enforcing Constitutions. *American Economic Review, Papers & Proceedings* 98(2), 105–109.
- Greif, A. (2008). The Impact of Administrative Power on Political and Economic Developments: Toward a Political Economy of Implementation. In E. Helpman (Ed.), *Institutions and Economic Performance*, Chapter 1, pp. 17–63. Harvard University Press.
- Harding, A. (1973). *The Law Courts of Medieval England*. London: George Allen & Unwin.
- Harriss, G. L. (1975). *King, Parliament, and Public Finance in Medieval England to 1369*. Oxford: Clarendon Press.
- Hernández, S. T. S. (2020). *Building an Empire in the New World. Taxes and Fiscal Policy in Hispanic America during the Seventeenth Century*. Ph. D. thesis, Universidad Carlos III de Madrid.
- Hilton, R. H. (1995). *English and French Towns in Feudal Society: A Comparative Study*. Cambridge University Press.
- Johnson, N. D. and M. Koyama (2014). Tax Farming and the Origins of State Capacity in England and France. *Explorations in Economic History* 51, 1–20.
- Kiser, E. and Y. Barzel (1991). The Origins of Democracy in England. *Rationality and Society* 3(4), 396–422.
- Ladero Quesada, M. Á. (1994). Monarquía y Ciudades de Realengo en Castilla. Siglos XII–XV. *Anuario de Estudios Medievales* 24, 719–774.
- Levi, M. (1988). *Of Rule and Revenue*. University of California Press.
- Lizzeri, A. and N. Persico (2004). Why Did the Elite Extend the Suffrage? Democracy and the Scope of Government with an Application to Britain’s “Age of Reform”. *Quarterly Journal of Economics* 119(2), 707–765.
- Maddicott, J. R. (1978). The County Community and the Making of Public Opinion in Fourteenth-Century England. *Transactions of the Royal Historical Society* 28, 27–43.
- March, J. (1962). The Business Firm as a Political Coalition. *Journal of Politics* 24, 662–678.

- Marongiu, A. (1968). *Medieval Parliaments: a Comparative Study*. London: Eyre & Spottiswoode.
- Mastorocco, N. and E. Teso (2023). State Capacity as an Organizational Problem. Evidence from the Growth of the US State Over 100 Years.
- Mayshar, J., O. Moav, and Z. Neeman (2017). Geography, Transparency, and Institutions. *American Political Science Review* 111(3), 622–636.
- Mazín, Ó. (2013). Leer la Ausencia: Las Ciudades de Indias y las Cortes de Castilla, Elementos para su Estudio (Siglos XVI y XVII). *Historias* 84, 99–110.
- Mitchell, S. K. (1951). *Taxation in Medieval England*, Volume 15. Yale University Press.
- Myerson, R. B. (2008). The Autocrat’s Credibility Problem and Foundations of the Constitutional State. *American Political Science Review* 102(01), 125–139.
- North, D. C., J. J. Wallis, and B. R. Weingast (2009). *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. Cambridge University Press.
- North, D. C. and B. R. Weingast (1989). Constitutions and Commitment: The Evolution of Institutions Governing Public Shoice in Seventeenth-Century England. *The Journal of Economic History* 49(04), 803–832.
- Oates, W. E. (1972). *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.
- Pasquet, D. (1964). *An Essay on the Origins of the House of Commons* (2nd ed.). Merlin Press, London.
- Puga, D. and D. Trefler (2014). International Trade and Institutional Change: Medieval Venice’s Response to Globalization. *Quarterly Journal of Economics* 129(2), 753–821.
- Rantakari, H. (2008). Governing Adaptation. *The Review of Economic Studies* 75(4), 1257–1285.
- Reid, R. R. (1917). The Office of Warden of the Marches; Its Origin and Early History. *The English Historical Review* 32(128), 479–496.
- Sanz, P. (1994). The Cities in the Aragonese Cortes in the Medieval and Early Modern Periods. *Parliaments, Estates and Representation* 14(2), 95–108.
- Snowberg, E. and M. M. Ting (2023). An Organizational Theory of State Capacity. Working Paper Columbia University.
- Stasavage, D. (2011). *States of Credit: Size, Power, and the Development of European Polities*. Princeton University Press.
- Tiebout, C. M. (1956). A Pure Theory of Local Expenditures. *Journal of Political Economy* 64(5), 416–424.
- Treisman, D. (1999). Political Decentralization and Economic Reform: A Game-Theoretic Analysis. *American Journal of Political Science* 43, 488–517.
- Turner, H. L. (1971). *Town Defences in England and Wales: An Architectural and Documentary Study, AD 900-1500*. John Baker, London.

- Van Zanden, J. L., E. Buringh, and M. Bosker (2012). The Rise and Decline of European Parliaments, 1188–1789. *The Economic History Review* 65(3), 835–861.
- Weingast, B. R. and W. J. Marshall (1988). The Industrial Organization of Congress; or, Why Legislatures, Like Firms, Are Not Organized as Markets. *Journal of Political Economy* 96(1), 132–163.
- White, A. B. (1933). *Self-government at the King's Command: A Study in the Beginnings of English Democracy*. The University of Minnesota Press.

## Appendix A Proofs of Lemmas and Propositions

**Proof of Lemma 1.** We prove the result stated in the lemma by showing that the inverses of (11) and (12), specifically:

$$\gamma_L > \gamma_T, \quad (\text{A.1})$$

$$\gamma_P > \frac{15\gamma_L - 7\gamma_T}{8} \equiv \underline{\gamma}, \quad (\text{A.2})$$

are *necessary* (but jointly not sufficient) conditions for  $P$ 's expected payoff from unit  $D_T$  to be higher under *Integration* than under *Separation*.

We start the proof by reporting  $P$ 's expected payoffs under *Integration* and *Separation*. Given  $\text{Var}(\theta_L) = \text{Var}(\theta_T) = \frac{\theta^2}{3}$  and  $\text{Var}(\theta_P) = \frac{\bar{\theta}^2}{3}$ , from (2), (6) and (7), it follows that  $P$ 's expected payoff under *Integration* is equal to:

$$\begin{aligned} U_P = & - \left\{ \frac{k_L}{2} (\gamma_P - \gamma_L)^2 + \frac{k_T}{2} \left[ 3(1 - \gamma_L)^2 + 2(1 - \gamma_T)^2 + (1 - \gamma_P)^2 \right] \right\} \frac{\theta^2}{3} \\ & - \left\{ \left[ \frac{k_L}{2} + \frac{k_T}{2} \right] (\gamma_P - \gamma_L)^2 + k_T (\gamma_L - \gamma_T)^2 \right\} \frac{\bar{\theta}^2}{3}. \end{aligned} \quad (\text{A.3})$$

From (2) and (9),  $P$ 's expected utility under *Separation* is:

$$\begin{aligned}
U_P = & - \left\{ \frac{k_L}{2} \left[ \left( (1 - \gamma_P) - \frac{3}{4} (1 - \gamma_L) \right)^2 + \frac{1}{16} (1 - \gamma_T)^2 \right] \right. \\
& + \frac{k_T}{2} \left[ \left( (1 - \gamma_P) - \frac{3}{4} (1 - \gamma_T) \right)^2 + \frac{1}{16} (1 - \gamma_L)^2 \right] \\
& + \left( \frac{k_L}{4} + \frac{k_T}{4} \right) \frac{1}{4} \left[ (1 - \gamma_L)^2 + (1 - \gamma_T)^2 \right] \left. \right\} \frac{\theta^2}{3} \\
& - \left\{ \frac{k_L}{2} \left( \gamma_P - \frac{3}{4} \gamma_L - \frac{1}{4} \gamma_T \right)^2 + \frac{k_T}{2} \left( \gamma_P - \frac{3}{4} \gamma_T - \frac{1}{4} \gamma_L \right)^2 \right. \\
& + \left( \frac{k_L}{4} + \frac{k_T}{4} \right) \frac{1}{4} (\gamma_L - \gamma_T)^2 \left. \right\} \frac{\bar{\theta}^2}{3}.
\end{aligned} \tag{A.4}$$

From (A.3),  $P$ 's expected loss from unit  $D_T$  under *Integration* equals:

$$\begin{aligned}
k_T \left\{ \left[ \frac{1}{2} \left[ (1 - \gamma_P)^2 + (1 - \gamma_L)^2 \right] + \left[ (1 - \gamma_L)^2 + (1 - \gamma_T)^2 \right] \right] \frac{\theta^2}{3} + \right. \\
\left. + \left[ \frac{1}{2} (\gamma_P - \gamma_L)^2 + (\gamma_L - \gamma_T)^2 \right] \frac{\bar{\theta}^2}{3} \right\}.
\end{aligned} \tag{A.5}$$

From (A.4),  $P$ 's expected loss from unit  $D_T$  under *Separation* is equal to:

$$\begin{aligned}
k_T \left\{ \frac{1}{2} \left[ \left( (1 - \gamma_P) - \frac{3}{4} (1 - \gamma_T) \right)^2 + \frac{1}{16} (1 - \gamma_L)^2 \right] + \frac{1}{16} \left[ (1 - \gamma_L)^2 + (1 - \gamma_T)^2 \right] \right\} \frac{\theta^2}{3} + \\
+ k_T \left\{ \frac{1}{2} \left( \gamma_P - \frac{3\gamma_T + \gamma_L}{4} \right)^2 + \frac{(\gamma_L - \gamma_T)^2}{16} \right\} \frac{\bar{\theta}^2}{3}.
\end{aligned} \tag{A.6}$$

From (A.5) and (A.6),  $P$  incurs a (strictly) smaller loss from  $D_T$  under *Integration* than under *Separation* if the left-hand-side in (10) takes a (strictly) negative value.

From (10), the ‘local-state component’ is weakly positive (and equal to zero when  $\gamma_P = \gamma_L = \gamma_T = 1$ ). Thus, a necessary condition for  $P$  to incur a (strictly) smaller loss from  $D_T$  under *Integration* than under *Separation* is that the ‘common-state component’ in (10) is (strictly) lower than zero. From (10), this condition is equivalent to (A.2). Moreover, the ‘common-state component’ is zero if  $\gamma_L = \gamma_T$ , meaning that (A.1) must hold for  $P$  to incur a (strictly) smaller loss from  $D_T$  under *Integration* than *Separation*.

Having established that (A.1) and (A.2) are necessary conditions for  $P$  to expect a higher payoff from unit  $D_T$  under *Integration*, it follows that the inverses of these conditions – namely, (11) and (12) – are (individually) sufficient conditions for  $P$  to expect a higher payoff from unit  $D_T$  under

*Separation.* ■

**Proof of Proposition 1.** The proof to the proposition builds on condition (10). Specifically, from the proof of Lemma 1, we can conclude that a necessary condition for  $P$  to obtain a higher expected payoff from unit  $D_T$  under *Separation* is that the left-hand-side in (10) takes non-negative values. For ease of reference, we state this necessary condition:

$$\begin{aligned} & \frac{\theta^2}{3} \underbrace{\left\{ (1 - \gamma_P)^2 + \frac{45}{16} (1 - \gamma_L)^2 + \frac{15}{8} (1 - \gamma_T)^2 - \left[ 1 - \gamma_P - \frac{3}{4} (1 - \gamma_T) \right]^2 \right\}}_{\text{Local-State Component}} + \\ & + \frac{\bar{\theta}^2}{3} \underbrace{\left\{ (\gamma_P - \gamma_L)^2 - \left( \gamma_P - \frac{1}{4}\gamma_L - \frac{3}{4}\gamma_T \right)^2 + \frac{15}{8} (\gamma_L - \gamma_T)^2 \right\}}_{\text{Common-State Component}} \geq 0. \end{aligned} \quad (\text{A.7})$$

We analyze parts  $a$  and  $b$  separately.

Part a): Suppose first that  $\gamma_L = \gamma_T$ . From Lemma 1, the sufficient condition (11) holds, proving that  $P$ 's expected payoff from the urban area  $D_T$  is higher under *Separation*. Moreover, if  $\underline{\theta} > 0$  (i.e.,  $\text{Var}(\theta_i) > 0$ , for  $i = \{L, T\}$ ) and the 'local-state component' is strictly positive,  $P$ 's expected payoff from the urban area  $D_T$  is strictly higher under *Separation*.<sup>30</sup>

Consider now the case in which  $\gamma_T < \gamma_L$ . As a consequence of the reasoning presented in the previous paragraph, by continuity, if  $\underline{\theta} > 0$ ,  $P$ 's expected payoff from the urban area  $D_T$  remains higher under *Separation* for values of  $\gamma_T$  that are just below  $\gamma_L$ . Therefore, the threshold  $\delta$  is strictly greater than zero.

Part b): Suppose first that  $\gamma_P \leq \underline{\gamma}$ , where  $\underline{\gamma}$  is defined in (12). From Lemma 1, the sufficient condition (12) holds, proving that  $P$ 's expected payoff from the urban area  $D_T$  is higher under *Separation*. Moreover, if  $\underline{\theta} > 0$  (i.e.,  $\text{Var}(\theta_i) > 0$ , for  $i = \{L, T\}$ ) and the 'local-state component' is strictly positive,  $P$ 's expected payoff from the urban area  $D_T$  is strictly higher under *Separation*.

Consider now the case in which  $\gamma_P > \underline{\gamma}$ . As a consequence of the reasoning presented in the previous paragraph, by continuity, if  $\underline{\theta} > 0$ ,  $P$ 's expected payoff from the urban area  $D_T$  remains higher under *Separation* for values of  $\gamma_P$  that are just above  $\underline{\gamma}$ . Therefore, the threshold  $\eta$  is strictly greater than zero.

We conclude the proof by proving that, all else equal, the thresholds  $\delta$  and  $\eta$  are  $i$ ) increasing in the variance of the local state (i.e., in  $\underline{\theta}$ ), and  $ii$ ) decreasing in the variance of the common state (i.e., in  $\bar{\theta}$ ). To prove both parts  $i$ ) and  $ii$ ), recall that the 'local-state component' in (A.7) is always positive. Moreover, for any configuration  $\{\gamma_T, \gamma_L\}$  that violates (11) and (12) (i.e., for any point

<sup>30</sup>Given A2 and  $\gamma_L = \gamma_T$ , the 'local-state component' is zero if and only if  $\gamma_P = \gamma_L = \gamma_T = 1$ .

belonging to the white area below the 45° line in Figure 1), the ‘common-state component’ in (A.7) is negative. As a consequence, we can conclude that:

- i) all else equal, the region of parameter values for  $\{\gamma_T, \gamma_L\}$  that satisfy (11) expands as the variance of the local state increases. This is because a higher variance of the local state increases the relative importance of the ‘local-state component’ compared to the ‘common-state component;’
- ii) all else equal, the region of parameter values for  $\{\gamma_T, \gamma_L\}$  that satisfy (11) contracts as the variance of the common state increases. This is because a higher variance of the common state increases the relative importance of the ‘common-state component’ compared to the ‘local-state component.’ ■

**Proof of Lemma 3.** From Lemma 2 and  $F(1) > F(0)$ , we have that  $P$  prefers  $C_T = 0$  to  $C_T = 1$ . ■

**Proof of Lemma 4.** We denote a generic cutoff of the partitions by  $\theta_{P,n}$ , for  $n \in \{-\infty, \dots, +\infty\}$ . We make the following technical assumption:

$$\mathbf{A4}: \gamma_T \in [0, \underline{\gamma}], \text{ with } \underline{\gamma} = \frac{\bar{\theta} - \theta}{\theta + \bar{\theta}} \gamma_L.$$

**A4** (joint with **A1**) ensures that, for any  $\{\theta_L, \theta_T\}$ , there exists a realization of  $\theta_P$  such that  $A_L$  truthfully reports  $\theta_P$  to  $A_T$ . Define  $\theta_P^M$  as the state on the boundary between two partitions,  $[\theta_{P,n-2}, \theta_{P,n-1})$  and  $[\theta_{P,n-1}, \theta_{P,n}]$ , with  $\theta_P^M = \theta_{P,n-1}$ .  $A_L$  sends a message  $m_L^l$  (resp.,  $m_L^h$ ) when  $\theta_P \in [\theta_{P,n-2}, \theta_{P,n-1})$  (resp.,  $[\theta_{P,n-1}, \theta_{P,n}]$ ). When the realized state of nature is on the boundary between two partitions,  $A_L$  must be indifferent between communicating  $m_L = m_L^l$  and  $m_L = m_L^h$ . We can therefore write  $A_L$ ’s incentive constraint (IC) at the communication stage as follows (where  $B \equiv \frac{3\gamma_T + \gamma_L}{4}$  and  $T \equiv \frac{3}{4}((1 - \gamma_L)\theta_L - (1 - \gamma_T)\theta_T)$ ):

$$\left\{ \left[ T + \gamma_L \theta_P^M - B \mathbb{E}_T(\theta_P | m_L^l) \right]^2 + \frac{1}{4} \left[ -T - \gamma_L \theta_P^M + B \mathbb{E}_T(\theta_P | m_L^l) \right]^2 \right\} = \quad (\text{A.8})$$

$$\left\{ \left[ T + \gamma_L \theta_P^M - B \mathbb{E}_T(\theta_P | m_L^h) \right]^2 + \frac{1}{4} \left[ -T - \gamma_L \theta_P^M + B \mathbb{E}_T(\theta_P | m_L^h) \right]^2 \right\}. \quad (\text{A.9})$$

Consider three cutoffs  $\{\theta_{P,n}; \theta_{P,n-1}; \theta_{P,n-2}\}$ , so that  $\mathbb{E}_T(\theta_P | m_L^l) = \frac{\theta_{P,n-2} + \theta_{P,n-1}}{2}$  and  $\mathbb{E}_T(\theta_P | m_L^h) = \frac{\theta_{P,n-1} + \theta_{P,n}}{2}$ . After replacing  $\theta_{P,n-1}$  for  $\theta_P^M$ , and given that  $\theta_L$ ,  $\theta_T$  and  $\theta_P$  are

independently distributed, we write (A.8) as:

$$- \left[ B^2 \left( \frac{\theta_{P,n-2} + \theta_{P,n-1}}{2} \right)^2 - 2B(T + \gamma_L \theta_{P,n-1}) \left( \frac{\theta_{P,n-2} + \theta_{P,n-1}}{2} \right) \right] \quad (\text{A.10})$$

$$- \frac{1}{4} \left[ B^2 \left( \frac{\theta_{P,n-2} + \theta_{P,n-1}}{2} \right)^2 + 2B(-T - \gamma_L \theta_{P,n-1}) \left( \frac{\theta_{P,n-2} + \theta_{P,n-1}}{2} \right) \right] \quad (\text{A.11})$$

$$= - \left[ B^2 \left( \frac{\theta_{P,n-1} + \theta_{P,n}}{2} \right)^2 - 2B(T + \gamma_L \theta_{P,n-1}) \left( \frac{\theta_{P,n-1} + \theta_{P,n}}{2} \right) \right] \quad (\text{A.12})$$

$$- \frac{1}{4} \left[ B^2 \left( \frac{\theta_{P,n-1} + \theta_{P,n}}{2} \right)^2 + 2B(-T - \gamma_L \theta_{P,n-1}) \left( \frac{\theta_{P,n-1} + \theta_{P,n}}{2} \right) \right]. \quad (\text{A.13})$$

After some manipulation, because  $\theta_{P,n}^2 - \theta_{P,n-2}^2 = (\theta_{P,n} - \theta_{P,n-2})(\theta_{P,n} + \theta_{P,n-2})$  we obtain the following non-homogeneous difference equation:

$$\theta_{P,n} - 2 \left( \frac{2\gamma_L - B}{B} \right) \theta_{P,n-1} + \theta_{P,n-2} = 4 \frac{T}{B}. \quad (\text{A.14})$$

We look for the general solution to (A.14). As a first step, we consider the homogeneous difference equation:

$$\theta_{P,n} - 2 \left( \frac{2\gamma_L - B}{B} \right) \theta_{P,n-1} + \theta_{P,n-2} = 0. \quad (\text{A.15})$$

Suppose  $\theta_{P,n} = Aw^n$ . Then, from (A.15), we obtain:

$$w^2 - 2 \left( \frac{2\gamma_L - B}{B} \right) w + 1 = 0 \quad \rightarrow \quad w = \frac{1}{B} \left[ 2\gamma_L - B \pm 2\sqrt{\gamma_L(\gamma_L - B)} \right], \quad (\text{A.16})$$

which gives us two distinct real roots. The general solution to (A.15) is:

$$\theta_{P,n} = A_1 \left\{ \frac{1}{B} \left[ 2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)} \right] \right\}^n \quad (\text{A.17})$$

$$+ A_2 \left\{ \frac{1}{B} \left[ 2\gamma_L - B - 2\sqrt{\gamma_L(\gamma_L - B)} \right] \right\}^n, \quad (\text{A.18})$$

where  $A_1$  and  $A_2$  are two generic constants.

As a second step, we find a particular solution to the non-homogeneous difference equation in (A.14). Because the term on the right-hand side is a constant, we have:

$$\theta_{P,n} = \frac{4 \frac{T}{B}}{1 - 2 \left( \frac{2\gamma_L - B}{B} \right) + 1} \quad \rightarrow \quad \theta_{P,n} = \frac{T}{B - \gamma_L}. \quad (\text{A.19})$$

Therefore, from (A.17) and (A.19), the general solution to (A.14) is:

$$\theta_{P,n} = A_1 \left\{ \frac{2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)}}{B} \right\}^n + A_2 \left\{ \frac{2\gamma_L - B - 2\sqrt{\gamma_L(\gamma_L - B)}}{B} \right\}^n + \frac{T}{B - \gamma_L}. \quad (\text{A.20})$$

In order to find values for  $A_1$  and  $A_2$ , we impose the following condition:

$$\theta_{P,0} = \frac{T}{B - \gamma_L} \rightarrow A_1 + A_2 = 0 \rightarrow A_1 = -A_2. \quad (\text{A.21})$$

The equality in (A.21) holds because  $A_L$  has no incentive to lie when  $\theta_P = \frac{T}{B - \gamma_L}$ . The second equality we exploit to find the solution to our difference equation is:

$$\theta_{P,1} = A_1 \left\{ \frac{2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)}}{B} \right\} + A_2 \left\{ \frac{2\gamma_L - B - 2\sqrt{\gamma_L(\gamma_L - B)}}{B} \right\} + \frac{T}{B - \gamma_L}, \quad (\text{A.22})$$

After substituting  $A_1 = -A_2$  in (A.22), we obtain:

$$A_1 = \frac{B}{4\sqrt{\gamma_L(\gamma_L - B)}} \left( \theta_{P,1} + \frac{T}{\gamma_L - B} \right), \quad A_2 = -\frac{B}{4\sqrt{\gamma_L(\gamma_L - B)}} \left( \theta_{P,1} + \frac{T}{\gamma_L - B} \right).$$

We use these expressions to rewrite (A.20):

$$\theta_{P,n} + \frac{T}{\gamma_L - B} = \frac{B \left( \theta_{P,1} + \frac{T}{\gamma_L - B} \right)}{4\sqrt{\gamma_L(\gamma_L - B)}} \left\{ \frac{1}{B} \left[ 2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)} \right] \right\}^n \quad (\text{A.23})$$

$$+ \frac{B \left( \theta_{P,1} + \frac{T}{\gamma_L - B} \right)}{4\sqrt{\gamma_L(\gamma_L - B)}} \left\{ \frac{1}{B} \left[ 2\gamma_L - B - 2\sqrt{\gamma_L(\gamma_L - B)} \right] \right\}^n. \quad (\text{A.24})$$

Take 2 cutoffs,  $n - x$  and  $n$ . Let  $Q = -T \equiv \frac{3}{4}((1 - \gamma_T)\theta_T - (1 - \gamma_L)\theta_L)$ . After defining  $H_+ \equiv 2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)}$  and  $H_- \equiv 2\gamma_L - B - 2\sqrt{\gamma_L(\gamma_L - B)}$ , we have:

$$\frac{\theta_{P,n-x} - \frac{Q}{\gamma_L - B}}{\theta_{P,n} - \frac{Q}{\gamma_L - B}} = \frac{\frac{B \left( \theta_{P,1} + \frac{T}{\gamma_L - B} \right)}{4\sqrt{\gamma_L(\gamma_L - B)}} \left\{ \left[ \frac{1}{B} (H_+) \right]^{n-x} - \left[ \frac{1}{B} (H_-) \right]^{n-x} \right\}}{\frac{B \left( \theta_{P,1} + \frac{T}{\gamma_L - B} \right)}{4\sqrt{\gamma_L(\gamma_L - B)}} \left\{ \left[ \frac{1}{B} (H_+) \right]^n - \left[ \frac{1}{B} (H_-) \right]^n \right\}}. \quad (\text{A.25})$$

As we let  $n$  go to infinity to solve for the most informative partition, we obtain:

$$\frac{\theta_{P,n-x} - \frac{Q}{\gamma_L - B}}{\bar{\theta} - \frac{Q}{\gamma_L - B}} = \left[ \frac{2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)}}{B} \right]^{n-x} \left[ \frac{B}{2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)}} \right]^n, \quad (\text{A.26})$$

because  $\lim_{n \rightarrow \infty} \left[ \frac{2\gamma_L - B - 2\sqrt{\gamma_L(\gamma_L - B)}}{B} \right]^{n-x} = 0$ . From (A.26), we obtain:

$$\theta_{P,n-x} - \frac{Q}{\gamma_L - B} = \left[ \frac{B}{2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)}} \right]^x \left( \bar{\theta} - \frac{Q}{\gamma_L - B} \right), \quad (\text{A.27})$$

which gives the cutoffs of the finest incentive-compatible partitions:

$$\theta_{P,n} - \frac{Q}{\gamma_L - B} = (\alpha_L)^{|n|} \left( \bar{\theta} - \frac{Q}{\gamma_L - B} \right), \quad \text{with } n \in \{-\infty, \dots, +\infty\}, \quad (\text{A.28})$$

where  $\alpha_L = \frac{B}{2\gamma_L - B + 2\sqrt{\gamma_L(\gamma_L - B)}} \in [0, 1]$ , with  $B \equiv \frac{3}{4}\gamma_T + \frac{1}{4}\gamma_L$  and  $Q \equiv \frac{3}{4}((1 - \gamma_T)\theta_T - (1 - \gamma_L)\theta_L)$ .

Finally, the quality of communication improves ( $\alpha_L$  approaches 1) as  $\gamma_T$  tends to  $\gamma_L$ . ■

**Proof of Lemma 5.** From Section 3.2.2, when  $\mathbf{g} = \{T, 1\}$ ,  $P$ 's expected payoff is given by (A.4) minus the cost of communication  $f$ . We start by distinguishing between the case in which  $f = 0$  and the case in which  $f > 0$ .

- 1) Suppose first that the cost of communication is zero (i.e.,  $f = 0$ ). Comparing (A.4) and (A.29) (where (A.29) is reported in Appendix B),  $P$  prefers *direct* communication to *indirect* communication,  $\forall k_T$ . When comparing (A.4) and (A.29), we have that, for  $f = 0$ , the information loss caused by *indirect* communication negatively affects  $P$ 's payoff from both units. To prove that  $P$  incurs a loss from  $D_T$ , note that the information loss implied by *indirect* communication leads to less adaptation and less external coordination within this unit. To prove that  $P$  incurs a loss from  $D_L$ , note that 1)  $\mathbb{E}((\mathbb{E}\theta_P)^2) \leq \frac{\bar{\theta}^2}{3}$ , 2) the term that multiplies  $\mathbb{E}((\mathbb{E}\theta_P)^2)$  in (A.29) is negative when  $k_T = 0$ , and 3) the sum of the two terms that multiply  $\mathbb{E}((\mathbb{E}\theta_P)^2)$  and  $\frac{\bar{\theta}^2}{3}$  in (A.29) is equal to the term that multiplies  $\frac{\bar{\theta}^2}{3}$  in (A.4). We can therefore conclude that, when  $f = 0$ , the difference between  $P$ 's expected payoffs from *direct* and *indirect* communication is positive and increases linearly with  $k_T$ .
- 2) As  $f$  increases and takes positive values,  $P$ 's expected payoff from *direct* communication shifts downward, whereas  $P$ 's expected payoff from *indirect* communication remains unaffected. As a consequence, because *i*) the difference between the two expected payoffs is positive when  $f = 0$ , and *ii*) this difference increases with  $k_T$ ,  $\forall f$ , for sufficiently high values of  $f$  there exists a threshold  $\hat{k}(f, \cdot) \geq 0$ , increasing in  $f$ , such that  $P$ 's expected payoff is higher under *direct* than under *indirect* communication for values of  $k_T \geq \hat{k}(f, \cdot)$ .

Let us define as  $\underline{f}$  the value of  $f$  such that  $\hat{k}(\underline{f}, \cdot) = 0$ .<sup>31</sup> For  $f \leq \underline{f}$ , our reasoning in part 1)

<sup>31</sup>The threshold  $\underline{f}$  is therefore defined such that  $P$ 's expected payoff from *direct* and *indirect* communication are the same when  $k_T = 0$ .

continues to hold:  $P$ 's expected payoff is higher under *direct* than under *indirect* communication,  $\forall k_T$ , proving part *i* in the lemma. For  $f \in (\underline{f}, \bar{f}]$ , from the reasoning presented in part 2), we have that  $P$  prefers *direct* (resp., *indirect*) to *indirect* (resp., *direct*) communication for  $k_T \geq \hat{k}$  (resp.,  $k_T \in [0, \hat{k})$ ). This proves part *ii* in the lemma. ■

**Proof of Proposition 2.** Consider first the case in which at least one of the conditions specified in parts *a* and/or *b* of Proposition 1 is met. Then, under complete information, a threshold  $\underline{k}$  for  $k_T$  exists such that  $P$  chooses *Integration* for  $k_T < \underline{k}$ , and *Separation* for  $k_T \geq \underline{k}$  (see Corollary 1).

Under incomplete information, if  $P$  chooses *Integration*, Lemmas 2 and 3 establish *a*) that she chooses *indirect* communication and *b*) that her expected payoff equals that under complete information. Likewise, if  $P$  chooses *Separation*, from Lemma 5, she chooses *direct* communication. Therefore, because  $f = \epsilon$  (with  $\epsilon$  set arbitrarily small), her expected payoff closely approximates that under complete information (becoming identical for  $f = 0$ ). Thus, under incomplete information, there exists a threshold  $\tilde{k}$  for  $k_T$  such that  $P$  chooses *Integration* with *indirect* communication for  $k_T < \tilde{k}$ , and *Separation* with *direct* communication for  $k_T \geq \tilde{k}$  (with  $\tilde{k} = \underline{k}$  when  $f = 0$ ).

Consider now the case in which none of the conditions specified in parts *a* and *b* of Proposition 1 hold. Then, under complete information,  $P$  chooses *Integration* for all  $k_T$ , as it yields a higher payoff for *both* units compared to *Separation*. Given Lemma 2, Lemma 3, and  $f = \epsilon$  (with  $\epsilon$  set arbitrarily small), the same reasoning applies to the case of incomplete information. Therefore,  $P$  chooses *Integration* with *indirect* communication for all  $k_T$ . ■

## Appendix B Additional Computations

$P$ 's expected payoff under *Separation* and *indirect* communication,  $U_P(T, 0)$ , is as follows (see Online Appendix Section A for details):

$$\begin{aligned}
& - \left\{ \frac{k_L}{2} \left[ \left( (1 - \gamma_P) - \frac{3}{4} (1 - \gamma_L) \right)^2 + \frac{1}{16} (1 - \gamma_T)^2 \right] \right. \\
& \quad + \frac{k_T}{2} \left[ \left( (1 - \gamma_P) - \frac{3}{4} (1 - \gamma_T) \right)^2 + \frac{1}{16} (1 - \gamma_L)^2 \right] \\
& \quad + \left( \frac{k_L}{4} + \frac{k_T}{4} \right) \frac{1}{4} \left[ (1 - \gamma_L)^2 + (1 - \gamma_T)^2 \right] \left. \right\} \frac{\theta^2}{3} \\
& - \left\{ \frac{k_L}{2} \left( \gamma_P - \frac{2}{3} \gamma_L \right)^2 + \frac{k_T}{2} \gamma_P^2 + \left( \frac{k_L}{4} + \frac{k_T}{4} \right) \frac{4}{9} \gamma_L^2 \right\} \frac{\bar{\theta}^2}{3} \\
& - \mathbb{E} \left( \mathbb{E}_T(\theta_P) \right)^2 \left\{ \left( \frac{k_L}{18} + \frac{k_T}{2} \right) \left( \frac{3}{4} \gamma_T + \frac{1}{4} \gamma_L \right)^2 + \left( \frac{k_L}{4} + \frac{k_T}{4} \right) \frac{4}{9} \left( \frac{3}{4} \gamma_T + \frac{1}{4} \gamma_L \right)^2 \right. \\
& \quad \left. - 2 \left( \frac{3}{4} \gamma_T + \frac{1}{4} \gamma_L \right) \left[ \frac{k_L}{6} \left( \gamma_P - \frac{2}{3} \gamma_L \right) + \frac{k_T}{2} \gamma_P + \left( \frac{k_L}{4} + \frac{k_T}{4} \right) \frac{4}{9} \gamma_L \right] \right\} - f,
\end{aligned} \tag{A.29}$$

where (with  $\alpha_L$  defined in the proof of Lemma 4):

$$\begin{aligned} \mathbb{E} \left( (\mathbb{E}_T \theta_P)^2 \right) &= \frac{1}{4} \left[ \left( 1 + \frac{\alpha_L (1 - \alpha_L)}{1 - \alpha_L^3} \right) \bar{\theta}_P^2 - \left( 1 - \frac{3\alpha_L (1 - \alpha_L)}{1 - \alpha_L^3} \right) \left( \frac{\underline{\theta}}{\gamma_L - \gamma_T} \right)^2 \right. \\ &\quad \left. \times \left( \frac{(1 - \gamma_L)^2}{3} + \frac{(1 - \gamma_T)^2}{3} - \frac{(1 - \gamma_L)(1 - \gamma_T)}{2} \right) \right]. \end{aligned} \quad (\text{A.30})$$