The Great Political Divergence

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Abstract

This paper investigates a worldwide phenomenon of "political divergence" among the East and the West. During the 8th to 10th century, both Western Europe and China achieved political stability but through dramatically different routes. Western Europe developed parliamentary representation on the basis of a power balance between the aristocracy and the crown, whereas China consolidated absolutism with the help of state bureaucracy and exam-based meritocracy. This paper provides empirical evidence to document this *great political divergence*, and proposes a unified theory to understand the relationship between institutions and monarchy-aristocracy power balance and its implication on political stability and long-run political development.

1 Introduction

The medieval period witnessed a significant improvement in political stability in many regions of the world, especially in Western Europe and China. Scholars on Western European history have long emphasized the importance of parliamentary system in bringing in political stability and subsequent economic development in Europe (e.g. Strayer, 1970; Downing, 1989; Van Zanden et al., 2012; Blaydes and Chaney, 2013; among others). However, China never developed a parliamentary system, and yet China obtained political stability during the same period. In fact, three seemingly incompatible features – political stability, political competition, and consolidated absolutism – co-emerged in imperial China from the 8th century onward (Fukuyama, 2011; Fu, 1993).

In this paper, we first present empirical evidence for the aforementioned phenomena. We show that the medieval time witnessed a significant improvement in political stability in both Western Europe and China. And more importantly,

we argue that those regions achieved stability through different institutional solutions. In Western Europe, feudal representation put constraints on the crown and the parliamentary meetings offered a venue for peaceful conflict resolution. Whereas in China and some other countries in East Asia such as Korea, the creation of a state bureaucracy, the establishment of exam-based meritocracy, and the subsequent decline of aristocratic politics helped consolidate the power of the King and eventually led to absolutism.

With a worldwide panel of 112 historical states, we show that both parliamentary meetings and the establishment of the civil service examination system (CSE) were associated with improvements in political stability. Moreover, with the help of the Polity IV database, we show that the political equilibrium of imperial China was one with low executive constraint but high political competition; while the one in Western Europe was the opposite, with high executive constraint but low political competition. The dramatically different experience of Western Europe and that of China demonstrated a pluralism in institutional development and suggested a possible existence of multiple solutions to the issue of political instability.

How did parliamentary system and meritocratic bureaucracy contribute to stability? We argue that a critical source of instability for historical states is a mismatch between de jure political institutions and de facto political power. De jure or official institutions govern the allocation of government positions and political rents, while de facto power determines the outcome of a conflict should one happens. De facto power could be affected by a wide variety of factors, including personal capabilities and ambitions, knowledge, family wealth, and military talents.

A major insight of our model is that there could be stochastic shocks to de facto political power, which may not be reflected in de jure institution in a timely manner. An heir to the throne may not have personal qualities that live up to his responsibility, while a military genius could be born as a commoner. Premodern institutions tend to be hard to change due to various social, political, and technological constraints, and the mismatch is a result of both stochastic shocks to de facto power and institutional lags. Ottinger and Voigtländer (2020) documented a wide range of variations in monarchs' intellectual capability and its strong link to state performance. Aristocrats might see opportunities in an inept king, while every king fears ambitious and capable associates. In premodern societies, the mismatch between de jure institution and de facto power could frequently lead to political instabilities.

We propose a theoretical model to explore the implication of institutional mismatch on political stability and the conditions under which institutional improvement occurs. Institutions, such as regular meetings of parliaments and exam-based meritocratic bureaucracies, reduce the mismatch between de jure institution and de facto power. However, they differ in the way that they achieve the reduction. Parliament meetings provide a venue for the aristocrats to communicate with each other and to bargain with the King after the realization of personal shocks, whereas standardized exams provide publicly verifiable information about the Aristocrat's ability. We investigate the implication of these

institutions on stability and political mobility, as well as conditions under which institutional improvements may endogenously emerge.

The model provides three implications. First, when coups are moderately destructive, both parliamentary system and meritocratic bureaucracy enhances political stability. Secondly, meritocratic institution automatically brings in political mobility among the aristocrats while parliamentary system only does so when the cost of renegotiation is sufficiently low or the uncertainty of personal shocks sufficiently high. Thirdly, and maybe ironically, it is the monarchy who prefers meritocracy while aristocrats have an incentive to push for parliamentary system. This accords well with the history of political development of many regions during the medieval time. In East Asia, strong monarchies in China, Korea, and Vietnam adopted CSE while powerful aristocratic families in Japan blocked it and pushed for feudalism, which eventually created a social structure in Japan that was closer to other Western feudal countries than its East Asian neighbors (Liu, 2007; Duus, 1969; Lewis, 1974). In Western Europe, landed aristocracy first established parliamentary system in England while strong monarchies in Prussia and France experimented with meritocratic bureaucracy (Fukuyama, 2014; Chapman and Chapman, 2004).

CSE-type meritocracy has long been admired by enlightened intellectuals and scholars, such as Voltaire, Francois Quesnay, and maybe most famously Max Weber. In this paper, however, we provide a different perspective on meritocratic bureaucracy. We agree with the literature that bureaucracies are important for political development, but not as some impersonal administrative apparatus. Instead, bureaucracies are institutions with rules governing the allocation of political power; and in a pre-modern society, might serve as an alternative to other institutions, such as feudalism. Despite a positive impact meritocracy might have on the general population, it was the monarchy that had the strongest incentive to push for meritocracy; and meritocratic institutions, in turn, strengthened the power of the monarchy and helped consolidate absolutism in these societies.

Our paper proceeds as following. First, we review the related literature. Second, we present a quick tour of the historical background and provide empirical evidence on the phenomenon of political divergence between the East and the West. Third, we provide a benchmark model and discuss the implication of meritocratic and parliamentary institution. Fourth, we extend the main model to multiple aristocrats and investigate the impact of institution on political competition and mobility. Lastly, we conclude and present some broader implications of our findings.

2 Literature

Our paper touches on several areas of literature. The most relevant literature is on the political development of historical states (Blaydes and Chaney, 2013; Dincecco and Wang, 2018; Kokkonen and Sundell, 2014; Ko et al., 2018; Hariri, 2012; Wang, 2018). One missing element in the general literature on political de-

velopment is the role and functions of bureaucracy. Fukuyama and others have argued that the political development literature is almost entirely based on the experiences of Europe and since bureaucracy did not play a prominent role in the state building in Europe bureaucracy has not received adequate analytical attention. Fukuyama was among the first to argue that if political development is defined in Weberian terms, China exhibited a high level of political development almost a millennium ahead of Europe. Francis Fukuyama once claims that "they (China) were actually the first civilization not to create a state but to create a modern state: that is to say, a state that was centralized, bureaucratic and had aspirations to be impersonal" (Fukuyama 2014). Also, "China was the first society to create a rational meritocratic bureaucracy by implementing civil service examinations and appointing outside governors without local tribal ties. This led to a strong and cohesive state" (Fukuyama 2011).

There are two main arguments in the literature on the relationship between bureaucracy and political development. One argues that effective bureaucracies are important for state development, particularly when political elites are shortsighted and even irrational (Amsden, 1989; Evans, 1995). The other claims that bureaucratic organization can be self-interested. Particularly, in developing countries, when political organs and institutions are weak, bureaucrats have the opportunities to hijack and exploit the system (Riggs 1962; Huber and Shipan, 2001). Our paper agrees with the first strand of literature that bureaucracies are important for political development, but not as some impersonal administrative apparatus. Instead, we believe that bureaucracies are institutions with rules governing the allocation of political power; and in a pre-modern society, could serve as an alternative to other institutions, such as feudalism. In this paper, we strive for a truly comparative analysis of meritocratic bureaucracy against a more thoroughly studied institution–parliamentary system–based on a game theoretical framework. By doing so, we hope to provide a perspective on meritocratic bureaucracy which is different from that of enlightened intellectuals or scholars of modern bureaucracies.

Secondly, our paper revisits a seminal idea first proposed by Huntington (1968) and succinctly summarized by Fukuyama (1997): "[O]rder itself was an important goal of developing societies, independent of the question of whether that order was democratic, authoritarian, socialist, or free-market." The great divergence between Europe and China between 8^{th} and 11^{th} centuries illustrates this Huntingtonian conjecture. Both Europe and China attained "order"—defined as political stability—but through diametrically opposite institutional solutions. Europe achieved democratic order on the basis of a power balance between the aristocrats and the crown whereas China achieved autocratic order through a gravitation of power to the crown at the expense of the aristocracy. Regime types, which are arguably a second-order feature of a political system, have received a lion share of empirical attention in political science. By documenting the *the great divergence* in historical political institutions, our paper revisits this historical development of regime order.

This paper is also connected to the literature on formal theories of nondemocratic regimes (for a survey, see Gehlbach et al., 2016). A recent effort

has been trying to analyze non-democratic regimes using fully specified game-theoretic models. Our paper is most related to the branch of the literature that addresses the power balance among the ruling elites (Acemoglu et al., 2008; Egorov and Sonin, 2011; Svolik, 2009; Myerson, 2008). For example, Acemoglu et al. (2008) develop a model of coalition formation that clarifies a challenges to regime stability resulted from an inability to make credible commitments, and Myerson (2008) illustrates how institutions, such as parliament, may resolve the commitment problem by enabling the leader's supporters to coordinate on abandoning him, should he renege on his commitment. Svolik (2009), on the other hand, emphasizes a conflict coming from imperfect monitoring of the dictator's opportunistic behavior. The motivation of our paper is deeply rooted in observations of historical states, where primogeniture, inheritance, and other forms of political reproduction played an important role. Therefore, we propose a new source of instability for historical states – a mismatch between de jure institution and de facto political power. Similar to Acemoglu and Robinson (2006) and Svolik (2009), in our paper, the decision power bestowed by de jure institution resides in one party, but agents excluded from formal de jure institution can still exert influence on the outcome because of their de facto power to take actions against the other party.

The last area of literature is China-specific. The question why the Chinese political system was so durable has a very long pedigree. Partially inspired by the *Great Divergence* debate,[1] modern researchers have become increasingly interested in the potential impact of China's historical political institutions on its developmental trajectory. A distinctive feature of Chinese political history is the early rise of a centralized and bureaucratic state ruled by an absolutist ruler. A burgeoning branch of this literature seeks to understand the implications of this feature, with specific emphasis on centralization (Ko et al., 2018; Rosenthal and Wong, 2011), bureaucracy (Fukuyama, 2011; Xi, 2019; Huang and Yang, 2020), state capacity (Ma, 2013; Sng and Moriguchi, 2014; Sng, 2014), and conflicts and political stability (Dincecco and Wang, 2018; Bai and Kung, 2011; Wang, 2018).[2] Our paper contributes to this literature by proposing a mechanism based on the power balance between the crown and the aristocracy.

3 Historical Backgrounds

Many scholars have documented the increase of political stability in historical states during the medieval time. Two indicators are widely used in the literature to measure political stability of historical states (Blaydes and Chaney, 2013; Kokkonen and Sundell, 2014; Wang, 2018). One is ruler duration: the number of years that a ruler stayed in power. The second is the probability of ruler

[1] As one of the classic questions in the field of economic history, the vast literature on the Great Divergence includes many classic texts, such as Landes (1998); Jones (2003); Pomeranz (2009), among others.

[2] For a survey of quantitative studies on Chinese economic history, Mitchener and Ma. (2016).

being deposed. Political instability is presumed to have arisen when the rulers stay in power for shorter periods of time and when the chances of deposed exits rise relative to the natural exits of rulers or emperors. Various indicators largely demonstrate the same pattern of a rise in political stability in Western Europe between the 5th and the 15th century.

To explain the rise in stability, scholars on Western European history emphasize the importance of parliamentary system (e.g. Strayer, 1970; Downing, 1989; Van Zanden et al., 2012; Blaydes and Chaney, 2013; among others). According to Blaydes and Chaney (2013), the usual narrative describing the birth of representative, sovereign-constraining political institutions begins with the collapse of the western Roman Empire. The fiscal power of the Germanic successor states tended to be weak. Lacking the capacity to introduce a system of tax collection, Charlemagne required landholders to contribute troops instead of funds. This change increased the power of large landlords in many ways and led to the creation of a landed aristocracy in Western Europe, which later served as the main power base for exerting constraints on the crown.

The parliamentary system can be viewed as a codification, formalization and expansion of the feudal system that prevailed in much of Europe. Under the feudal system, the European barons held substantial land holdings and access to other economic opportunities. Parliament meetings provide them a venue to communicate with each other and to collectively bargain with the King. Many scholars argue that parliaments placed substantial constraints on the crown's opportunistic behavior and strengthened aristocracy's position (Myerson, 2008; North and Weingast, 1989).

However, China never developed a parliamentary system nor any of the executive constraints, and yet political stability improved in imperial China over the same period. We collect data on ruler duration and exits in China, from 221 BCE to 1911, and compare it with data on Western European monarchies used in Blaydes and Chaney (2013). The various measures are broadly consistent in highlighting the following pattern, as shown in Figure 1: political stability in imperial China, similar to that in Western Europe, has been largely increasing from the 5th century till the 19th century.

[Figure 1 about here.]

In fact, not only China did not develop parliamentary system, scholars have long noticed the co-emergence of political stability and absolutism in imperial China (Fukuyama, 2011; Fu, 1993). During the process of absolutism consolidation, the establishment of the civil service examination system (CSE) was considered a pivot point. The CSE system was established in China during the Sui dynasty (580-618), expanded and formalized during the Tang (618-907) and the Song dynasty (960-1279), and continued for more than a millennium until its abolition in 1905. The CSE was also introduced to other East Asian countries, including Korea, Vietnam, and Japan, a point we will discuss later in Section 6.

In China, the CSE was the major path to office for almost thirteen centuries. For example, during the Ming dynasty in the 15th to 16th century, it produced

about 50% to 70% of government officials depending on the year, followed by purchase which made up 20% to 40% and inheritance only 1% (Ho, 1962). Moreover, the CSE engendered arguably the world's first nationwide public school system. The imperial government set up public schools down to the prefecture level during the Sung dynasty (960-1279) and further to the county level in the Ming (1368-1644) and the Qing dynasty (1645-1912) (Schneewind, 2006). The schools were primarily funded by the government and open to all citizens conditional on passing a qualification exam.[3] Talents got recognized, and ambitions fulfilled.[4] In this way, the CSE and its supporting infrastructure operationalized the idea of "governance by merit", generated a class of "bureaucratic literati" in place of landed aristocracies, and promoted social mobility to a level that was substantial for a pre-modern world (Ho, 1962; Jiang and Kung, 2015; Elman et al., 2000; Maddison, 2007).

To empirically examine the impact of the two institutions on political stability, we combine data from Blaydes and Chaney (2013), Morby (1989), and additional data sources on East Asian countries (see the notes under Table 1). We come up with a dataset covering 4119 rulers in 564 dynasties from 112 historical countries around the world. We perform the following regression:

$$Duration_{it} = Parl_{it} + CSE_{it} + \alpha_j + \theta_t + \epsilon_{it}$$

where i index the ruler, t the century, and j the country. Variable $Parl_it$ is a dummy which equals to one if the ruler held at least one parliament meeting during his reign, while CSE_it is a dummy equal to one if the ruler held at least civil service examination during his reign.

The results are shown in Table 1. In a sample of 112 historical states spanning the Eurasia, both parliamentary meetings and the CSE variable are positively and significantly correlated with political stability indicators, even after controlling for country and century fixed effect.

[Table 1 about here.]

To take a closer look at the impact of the CSE, the following Figure 2 plots the time series of stability indices in two countries, China and Korea, against the scale of the CSE system.[5] The scale of CSE is measured by the annual number of Jinshi degree holders granted by the CSE system. As shown in Figure 2(a), CSE significantly increased ruler duration and lowered the probability of a ruler being deposed. The impact is even more prominant in the case of Korea. In Figure 2(b), political stability (as measured by both ruler duration and depose

[3]The schools were made open to all citizens during the Ming dynasty, excluding a small percentage of the population including criminals, clergy, and workers in the entertainment industry.

[4]Although there remains substantial debate about what kind of talent got recognized by the CSE – memorizing classics or genuine insights of statecraft, there is not much debate about its breaking down of aristocratic monopoly of political power.

[5]Vietnam was left out because of its substantial period of colonization under either imperial China or Western countries. Japan was left out because CSE never fully developed in the country, a point that will be further discussed in Section 6.

probability) had been on a continuous decrease since the 1st century. But the establishment of the CSE in the 11th century, especially the expansion of its scale during the 15th century, brought political stability to a dramatically higher level.

[Figure 2 about here.]

Under the two types of institutions, China and Western Europe eventually reached dramatically different outcomes. Even before the Industrial Revolution, imperial China and Western Europe already harbored systematic differences in their political systems. The Polity IV project provides the best data we can find that offers a cross-country comparison of historical political systems. As shown in Figure 3 Panel (a), at the beginning of the 19th century, China had a Democracy Index which was similar to that of Western Europe.[6] However, below the surface, the type of political equilibrium was very different. As shown in Figure 3 Panel (b) and (c), imperial China was an autocracy with low executive constraints and high political competition, while Western Europe had low political competition but high executive constraints. Over the centuries, China had evolved towards a "meritocratic absolutism" equilibrium dominated by the monarchy. Political stability was achieved by bestowing unquestionable authority on the King, with various institutions to regulate the elite such as the CSE. In comparison, Western Europe evolved towards a "power-sharing equilibrium" featuring frequent parliamentary meetings and power-sharing among the elite.

[Figure 3 about here.]

4 The Model

The comparison of Western Europe and China suggests the possibility of multiple institutional solutions to the issue of political instability, a point we will further develop in this section. We start out by setting up a theoretical model to examine the function of meritocratic and parliamentary institution under monarchies and the power dynamics between the crown and the aristocracy. Similar to Acemoglu and Robinson (2006, 2008), we model power dynamics based on an interaction between *de jure* institutions and *de facto* political power. *De jure* or official institutions in our setting govern the allocation of rents, while *de facto* political power determines the outcome of a conflict should a coup be staged. Hence, a player with no de jure institutional authority could still affect the outcome by making a threat based on his de facto power.[7]

A major insight of our model is that there could be frequent stochastic shocks to de facto political power, following birth, death, and new technology, which may not be reflected in de jure institutions in a timely manner. An heir to

[6] Korea and Vietnam was under foreign rule at the beginning of the 19th century, and hence their PolityIV indices were not used.

[7] De facto political power could be affected by a wide variety of factors, including personal capabilities and ambitions, knowledge, family wealth, and military talents.

the throne may not have the qualities that live up to his responsibility, while a military genius could be born as a commoner. Exogenous shocks could happen to the de facto power of either the King or the aristocrats. Either case it will create a mismatch between de jure institution and de facto power, and lead to political instabilities in a pre-modern world.

This mismatch is a result of both stochastic shocks to de facto power and institutional lags. In pre-modern societies, formal institutions cannot be revised frequently. The institutional lag, and hence the extend of the mismatch, is determined by a wide range of factors, including culture, traditions, social norms, transportation cost, and communication technologies. In this paper, we do not investigate the source of this mismatch; instead, we take the extend of the mismatch as a given parameter of our model, and investigate its implications on stability and institutional development.

Institutions, such as regular meetings of parliaments and CSE-type meritocratic bureaucracies, reduce the mismatch in different ways. In this section, we analyze a two-player game between the King and the Aristocrat, to highlight the implication of institutions on the power dynamics between the crown and the aristocracy. In Section 5, we extend the model to multiple Aristocrats and investigate the implication of institutions on political competition and mobility among the Aristocrats.

4.1 Benchmark: No Institution

We first consider a three-stage proposal game with two players, the King (K) and an Aristocrat (A). The King has a personal wealth of w^K, and the aristocrat has w^A. For notation simplicity, let $w_0 = w^A + w^K$. In Stage 1, the King makes a proposal to readjust the wealth. The proposal is indicated by $(r^K, r^A) \in R^2$, with the King receiving r^K and the Aristocrat receiving r^A. $r^A + r^K = 0$. For simplicity, we henceforth use r^A alone to indicate the King's strategy. When r^A is negative, the King takes wealth away from the Aristocrat. When $r^A > 0$, the King compensates the Aristocrat with some of his own wealth. The proposal is made before any individual shocks are realized, and hence represents the de jure institution.

In Stage 2, nature chooses an exogenous shock of e^A to the Aristocrat's de facto power.[8] The shock affects the Aristocrat's probability of winning a conflict should a coup be staged, but not his personal wealth. For simplicity, we assume that e^A can take only two values $e^A \in \{L = \frac{1}{\sigma}, H = \sigma\}$ with equal probabilities. Here, the parameter $\sigma \in [1, \infty)$ characterizes the amount of uncertainty in the underlying environment.

In a world with no institutional improvement, the shock e^A remains the Aristocrat's private information. In Stage 3, the Aristocrat chooses to accept the proposal (r^A, r^K) or to initiate a coup. If he decides to initiate a coup, he has a probability of winning which is proportional to his de facto power

[8] Strictly speaking, shocks to either the King or the Aristocrat could create uncertainty. For simplicity, in this paper we assume that any such shocks are captured by e^A. Allowing for shocks to both the King and the Aristocrat will not change the results.

relative to the King's. In other words, the Aristocrat succeeds with probability $P(e^A w^A, w^K) = \frac{e^A w^A}{e^A w^A + w^K}$. If he succeeds, a portion $1-\theta$ of the wealth gets destroyed in the process, but the Aristocrat gets all the remaining wealth θw_0 that is preserved ($0 < \theta < 1$). If he fails, he receives a payoff of zero, and the King gets all the remaining wealth θw_0. For simplicity, assume that both players' utility functions are linear in wealth, i.e. $U(x) = x$.

The following Figure 4 plots the time line of the benchmark game.

[Figure 4 about here.]

First, let's consider the Aristocrat's problem. Let the Aristocrat's strategy be denoted by (β_L, β_H), where β_{e^A} stands for his probability of initiating a coup after receiving a shock of e^A. Assume that the Aristocrat does not coup if he is indifferent between coup or not. Facing a proposal of r^A and a realized shock of e^A, the Aristocrat will initiate a coup if and only if the following is satisfied:

$$w_0 \theta P(e^A w^A, w^K) > w^A + r^A \tag{1}$$

Under the scenario, there could be a mixed strategy equilibrium where the Aristocrat is indifferent between coup and no coup when he gets a specific value shock. However, as long as $\theta < 1$, a pure strategy equilibrium where the aristocrat never revolts when he's indifferent is focal in the sense that the King strictly prefers it. Hence, we only focus on pure strategy equilibrium in this paper, $(\beta_L, \beta_H) \in \{0, 1\}$.

Given (β_L, β_H), the King chooses his optimal proposal r^A to maximize the following expected utility

$$\begin{aligned} & Max_{r^A} EU^K(\sigma, w^A, w^K) \\ & = \frac{1}{2} \sum_{e^A} \left[(1 - \beta_{e^A})(w^K + r^K) + \beta_{e^A} w_0 \theta \left(1 - P(e^A w^A, w^K)\right) \right] \end{aligned} \tag{2}$$

Given (β_L, β_H), EU^K strictly decreases in r^A. In an equilibrium, the King will propose a r^A that makes the aristocrat indifferent with coup or not either at $e^A = 1/\sigma$ or $e^A = \sigma$, but not both. We have the following theorem.

Theorem 4.1 (Equilibrium Under No Institution)**.** *For the benchmark game with no institution,*

- *If $\theta \leq \frac{1}{2}$, it has a unique stable equilibrium, where the King proposes $r^A = w_0 \theta P(\sigma w^A, w^K) - w^A$ and the Aristocrat never coups.*
- *If $\theta > \frac{1}{2}$, for every w^A, w^K, there exist a $\tilde{\sigma}$ such that when $\sigma \leq \tilde{\sigma}$, the game has a unique stable equilibrium similar to the one described above. When $\sigma > \tilde{\sigma}$, the game has a unique unstable equilibrium, where the King proposes $r^A = w_0 \theta P(\frac{w^A}{\sigma}, w^K) - w^A$ and the Aristocrat initiates a coup if and only if he receives a low value shock.*

Proof. Proof is given in Appendix 8.2. □

Figure 5 plots the two types of equilibria with parameter $w_0 = 9$ and $\theta = 0.7$. The orange region demonstrates the unstable equilibria, while the blue the stable equilibria with no coup.

[Figure 5 about here.]

Corollary 4.1.1. *The threshold institutional uncertainty $\tilde{\sigma}(w^A, w^K)$ has the following comparative statics:*

- *For each pair of w^A, w^K, $\tilde{\sigma}(w^A, w^K)$ decreases in θ;*
- *When $w^K \geq w^A$, $\tilde{\sigma}(w^A, w^K)$ increases in w^K;*
- *When $w^K < w^A$, $\tilde{\sigma}(w^A, w^K)$ decreases in w^K;*

In the benchmark game, political instability increases when the extent of mismatch is larger or the coup is less destructive. Also, the impact of institutional mismatch is amplified when the King and the Aristocrat has a more balanced power dynamics.

4.2 Meritocratic Institution

Meritocratic institutions, such as the CSE, can reduce information asymmetry by providing information about the Aristocrat's shock.

Definition 4.1. A *Meritocratic Institution* reduces information asymmetry by sending a public and verifiable signal of Aristocrat's de facto power shock.

In this section, we add one step in Stage 2 of the benchmark game's timeline before the Aristocrat makes coup decision. Assume that now we have a meritocratic institution. After the nature has determined the shock to Aristocrat's de facto power, the Meritocratic Institution would send a public and verifiable signal $s^A = s(e^A)$ to all the parties. The remaining of the game unfolds in the same way as what is outlined in Section 4.1. The timeline of the game under meritocratic institution is shown in Figure 6.

[Figure 6 about here.]

Under the Meritocratic Institution, a public signal is sent after the King has already proposed the de jure institution. Hence, it will not change the King's action ex post, but the fact that the signal is verifiable enables the King to make the de jure institution conditional on the signal. In other words, the King would propose (r_L^A, r_H^A) under a Meritocratic Institution, where $r_{s^A}^A$ is implemented when the signal turns out to be s^A. Even though there is no independent enforcement agency (e.g. court), the contracts are self-enforceable

and there would be no commitment problem as long as the signals are at least partially informative (i.e. $\pi_{HH} > \pi_{LH}$).[9]

Let $\{\pi_{e^A s^A}\}$ denote the probability of getting a signal of s^A when the Aristocrat's true shock is e^A, where $e^A s^A \in \{HH, HL, LH, LL\}$. First, consider the Aristocrat's problem. Given a realized shock of e^A and a public signal of s^A, he will coup if and only if the following is satisfied:

$$w_0 \theta P(e^A w^A, w^K) > w^A + r^A_{s^A} \tag{3}$$

Denote the Aristocrat's strategy as $\{\beta_{e^A s^A}\}$. Given the Aristocrat's strategy, the King chooses his optimal proposal (r^A_H, r^A_L) to maximize the following expected utility:

$$EU^K = \sum_{e^A, s^A} \frac{1}{2} \pi_{e^A s^A} [(1 - \beta_{e^A s^A})(w^K - r^A_{s^A}) + \theta w_0 \beta_{e^A s^A} (1 - P(e^A w^A, w^K))] \tag{4}$$

We have the following theorem.

Theorem 4.2 (Meritocratic Equilibrium)**.** *Under the Meritocratic Institution, the institution sends a public signal of $s(e^A) = s^A$.*

1. *When $\theta \leq \frac{\pi_{HL}}{\pi_{LL}+\pi_{HL}}$, the game has a unique stable equilibrium, where the King proposes an unconditional offer $r^A = w_0 \theta P(\sigma w^A, w^K) - w^A$ and A never coups.*

2. *When $\frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}} \geq \theta > \frac{\pi_{HL}}{\pi_{LL}+\pi_{HL}}$, there exist two types of equilibrium. For every w^A, w^K, there exist a $\tilde{\sigma}_1$ such that*

   (a) *When $\sigma \leq \tilde{\sigma}_1$, the game has a unique stable equilibrium similar to 1.*

   (b) *When $\sigma > \tilde{\sigma}_1$, the game has a unique unstable equilibrium, where the King offers (r^A_H, r^A_L) conditional on the signal, with $r^A_H = w_0 \theta P(\sigma w^A, w^K) - w^A$, $r^A_L = w_0 \theta P(\frac{w^A}{\sigma}, w^K) - w^A$, and the coup probability equals to $\frac{1}{2}\pi_{HL}$.*

3. *When $\theta > \frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}}$, there exist three types of equilibrium. For every w^A, w^K, there exist a pair of $(\tilde{\sigma}_1, \tilde{\sigma}_2)$ such that*

   (a) *When $\sigma \leq \tilde{\sigma}_1$, the game has a stable equilibrium similar to 1.*

   (b) *When $\tilde{\sigma}_1 < \sigma < \tilde{\sigma}_2$, it has a unique unstable equilibrium similar to 2.(b).*

[9] In many historical states, such as China, even though there was no explicitly stated contracts specifying the allocation of political power, the exam rankings and the promotions of the bureaucrats were public information. Hence, the public and verifiable nature of the institutional signal (exam ranking) and the repeated observation of history made the allocation of political power essentially a conditional offer.

(c) *When $\sigma > \tilde{\sigma}_2$, it has an unstable equilibrium, where the King proposes an unconditional offer $r_H^A = r_L^A = w_0\theta P(\frac{w^A}{\sigma}, w^K) - w^A$, and the coup probability equals to $\frac{1}{2}$.*

Proof. Proof is given in Appendix 8.2. □

Similar to Theorem 4.1, political uncertainty under the Meritocratic Institution also increases with θ, the portion of total wealth that is preserved after the coup, and σ, the extent of the institutional mismatch. The Meritocratic Institution, however, enables a third type of equilibrium, where the King proposes a de jure institution that is conditional on the signal. And this third type of equilibrium disappears when the signal structure becomes non-informative.

The following Figure 7 gives a numerical simulation of the equilibrium under Meritocratic Institution when $w_0 = 9$, $\theta = 0.7$, and the signal structure satisfies $\{\pi_{e^A s^A}\} = 0.7(HH), 0.3(HL), 0.6(LL), 0.4(LH)$. Similar to Figure 5, the blue region indicates the stable equilibria, the orange the unstable equilibria with coup probability equal to $\frac{1}{2}$, and the yellow region shows the third type of equilibrium where the King proposes a conditional offer and the Aristocrat coups with a probability of $\frac{1}{2}\pi_{HL}$.

[Figure 7 about here.]

Based on Theorem 4.2, we have the following corollaries.

Corollary 4.2.1 (King's Preference)**.** *The King always weakly prefers the Meritocratic Institution over no institution, and his expected utility under the Meritocratic Institution is increasing in the informativeness of the signal (i.e. larger π_{LL} and π_{HH}).*

Corollary 4.2.2 (Stability Improvement Under Meritocratic Institution)**.** *When $\theta > \frac{1}{2}$, the Meritocratic Institution decreases stability when σ is between $\tilde{\sigma}_1$ and $\tilde{\sigma}$, and increases stability when σ is between $\tilde{\sigma}$ and $\tilde{\sigma}_2$.*

Corollary 4.2.3 (Stability Improvement Under Meritocratic Institution)**.** *The Meritocratic Institution is more likely to improve political stability when the signals are more informative (i.e. larger π_{HH} or larger π_{LL} or both).*

A Meritocratic Institution will always benefit the King by giving him the ability to better differentiate between high-type and low-type Aristocrats. However, this ability to make conditional offer, despite reducing the mismatch between de jure institution and de facto power, may not necessarily improve the political stability in the society. This is because when the signals are informative enough, the King may find it optimal to lower the offer to the low-type Aristocrat and hence increases the probability of coup from a small portion of unlucky high-type Aristocrats that get low signals.

Corollary 4.2.4 (Aristocrat's Preference)**.** *The Aristocrat only prefers the Meritocratic Institution over no institution when σ is between $\tilde{\sigma}$ and $\tilde{\sigma}_2$.*

Figure 8 gives a numerical demonstration of the two parties' preference toward Meritocratic Institution when $w_0 = 9$, $\theta = 0.7$, and $\{\pi_{e^A s^A}\} = 0.7(HH), 0.3(HL), 0.6(LL), 0.4(LH)$. The red region indicates the parametric space where the King has an incentive to establish Meritocratic Institution, while the blue region where the Aristocrat has. The dashed lines indicate where political stability would be improved under a Meritocratic Institution.

In other words, a society could potentially witness the endogenous emergence of Meritocratic Institution based on a consensus of the crown and the aristocracy. And such an institutional improvement would greatly enhance the political stability of the society, especially when the Meritocratic Institution is truly "meritocratic" (with an informative information structure). This accords well the the history of the CSE. In most East Asian countries, the CSE was introduced through a peaceful process despite the crown being the major advocate. And the establishment of CSE was associated with a positive improvement in the political stability of these countries, as shown in Section 3.

[Figure 8 about here.]

4.3 Parliamentary Renegotiation

The Parliamentary Institution, in comparison, addresses the mismatch problem by allowing for renegotiation after the realization of shocks. Under Parliamentary Institution, the crown and the aristocrats hold regular meetings to discuss state affairs and solved grievances. A taxation or redistribution plan can only be implemented with endorsements from both parties. In other words, Parliamentary Institution changes the monarchy-aristocracy power dynamics in two ways: first, it enhances timely communication and resolves information asymmetry ex post. Secondly, it provides a venue for the Aristocrat to renegotiate with the King without resorting to coups. By doing so, it enhances the Aristocrat's bargaining power and changes the proposal game into a bargaining one.

Definition 4.2. A *Parliamentary Institution* resolves information asymmetry ex post and allows for renegotiation between the King and the Aristocrats after the realization of the shock.

We revise our benchmark model to capture the features of the Parliamentary Institution. In stage 1 before the realization of any shocks, the King proposes (r_1^K, r_1^A). In stage 2, the nature sends a shock e^A to the Aristocrat's de facto power. Then, the Parliament convenes, both the King and the Aristocrat learn about the shock, and they try to reach a new agreement on wealth readjustment (indicated by r_2^K, r_2^A). If r_2^A is different from the initial proposal r_1^A, then it incurs a personal cost c to the King. The parameter c captures the flexibility of the institutions in the society. If the King and the Aristocrat successfully reach an agreement, then payoffs realize in stage 3. Otherwise, a coup will be staged and each player has a probability of winning the coup which is proportional to his de facto power. The timeline of the game under the Parliamentary Institution is shown in Figure 9.

[Figure 9 about here.]

We solve the game by backward induction. During the renegotiation, the disagreement payoff for the two players are

$$U^K(d) = w_0\theta[1 - P(e^A w^A, w^K)] \tag{5}$$
$$U^A(d) = w_0\theta P(e^A w^A, w^K) \tag{6}$$

And the Nash bargaining solution solves the following maximization problem

$$Max_{r_2^A}[U^K(r_2^A) - c - U^K(d)][U^A(r_2^A) - U^A(d)] \tag{7}$$

Substitute Equation (5) and (6) into maximization (7) and solve for the F.O.C., we have

$$r_2^A = w_0\theta P(e^A w^A, w^K) + \frac{w_0(1-\theta) - c}{2} - w^A \tag{8}$$

We have the following theorem.

Theorem 4.3 (Parliamentary Equilibrium)**.** *Under the Parliamentary Institution,*

- *if* $c \geq w_0\theta\left(P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)\right)$*, there exist a unique equilibrium where the King proposes* $r_1^A = \frac{w^K - w^A - c + w_0\theta(2P(\sigma w^A, w^K) - 1)}{2}$*, and the Aristocrat always accepts the proposal regardless of his shock.*
- *If* $c < w_0\theta\left(P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)\right)$*, there exist a unique equilibrium where the King proposes* $r_1^A = \frac{w^K - w^A - c + w_0\theta(2P(\frac{w^A}{\sigma}, w^K) - 1)}{2}$*, the Aristocrat accepts the proposal when he gets a low shock, and demands renegotiation when he gets a high shock.*

Proof. Proof is given in Appendix 8.2. □

In either case, coups will not happen under Parliamentary Institution and political stability will be improved.

Corollary 4.3.1 (King's Preference)**.** *The King prefers the Parliamentary Institution over no institution if and only if*

$$c > max\{w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)], w_0(1-\theta)\}.$$

Corollary 4.3.2 (Aristocrat's Preference)**.** *The Aristocrat prefers Parliamentary Institution over no institution if one of the following is satisfied:*

- *When* $c < w_0(1-\theta)$*, the Aristocrat will prefer Parliament over no institution if* σ *s.t.* $P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) > \frac{1-\theta}{\theta}$ *or* $P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) < max\{\frac{c}{w_0\theta}, \frac{w_0(1-\theta)-c}{w_0\theta}\}$.

- *When $c \geq w_0(1-\theta)$, the Aristocrat will prefer Parliament over no institution if σ s.t. $\frac{c}{w_0\theta} > P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) > max\{\frac{1-\theta}{\theta}, \frac{c-w(1-\theta)}{w_0\theta}\}$.*

From the King's perspective, the attractiveness of the Parliamentary Institution always increases in c and decreases in σ, whereas the Aristocrat's preference is not monotone. Combining Lemma 4.3.1 and 4.3.2, a society will witness an endogenous emergence of Parliamentary Institution under consensus of both parties if and only if the cost of renegotiation is remarkably larger. In fact, the cost of renegotiation c has to be bigger than the cost of coup $w_0(1-\theta)$. In reality, this is very unlikely. Under the more realistic assumption of $c < w_0(1-\theta)$, only the Aristocrat would have an incentive to push for Parliamentary Institution, while the King wants to block it. This accords well with the history of England, where the development of the parliament features a prolonged process of conflicts and civil wars and was only established after the barons achieved major military success against the crown.

The following Figure 10 gives a numerical demonstration of the equilibrium when $\theta = 0.7, w_0 = 9, c = 1$. Figure 10a demonstrates the type of equilibrium under the Parliamentary Institution. The blue color shows the parametric space where there is no renegotiation in the equilibrium, and the green color the space where there is renegotiation when the Aristocrat receives a high value shock. Figure 10b shows the preference of the players. The blue region indicates where the Aristocrat has incentives to establish parliament, whereas the King always has an incentive to block it. And the dashed line indicates where political stability would be improved under a Parliamentary Institution.

[Figure 10 about here.]

4.4 Discussion and Institutional Comparison

There are three empirical facts that stand out prominently from the historical comparison of China and Western Europe in Section 3. First, both CSE and Parliament were associated with improvements in political stability. Secondly, the monarchies seemed to be the major advocates for CSE in East Asia while aristocracies pushed for Parliaments in Western Europe. Thirdly, the two regions henceforth evolved into two different types of long-run political outcomes: low executive constraints (autocratic) and high political mobility in China, and high executive constraints (democratic) and low political mobility in Western Europe.

The results of our model accords well with the first two empirical facts (the third will be discussed in Section 5). When a society started out in an unstable equilibrium, an institutional improvement towards either Meritocratic or Parliamentary Institution could reduce the coup probability and increase political stability. The destructiveness of a coup, as measured by θ, is a critical parameter in our model. When conflicts are very destructive (e.g. $\theta < 2/3$), coups are effectively deterred even under no institution. In this case, neither Meritocratic nor Parliamentary Institution improves stability. Only when coups are

mildly destructive ($\theta < \frac{1}{2}$), institutional improvements could improve political stability.

The two institutions provide different solutions to the same problem. Meritocratic Institutions, such as CSE, reduce the mismatch between de jure institution and de facto power by making the former inherently more flexible. It allows for rent allocation to be conditional on a public and verifiable signal. It does not resolve information asymmetry perfectly. But it mitigates the impact without any ex post changes to the de jure institution.

The Parliamentary Institution, in comparison, resolves the problem by allowing for ex post renegotiation. It provides a venue for the aristocrats to communicate and bargain with the King after shocks are realized, and thus enables timely readjustments of de jure institution. By doing so, it also enhances the bargaining power of the aristocrats and is largely disliked by the crown.

Because of the different solutions they offer, the two institutions have contrasting paths of development. It is possible for a Meritocratic Institution to receive support from both the crown and the aristocracy and to enjoy a peaceful transition, while a Parliamentary Institution is more likely to emerge through conflicts and military success of the aristocrats (as in England) or necessities and compromises of the crown (as in the Carolingian Empire). When both options are available, the King generally prefers the Meritocratic Institution while the Aristocrat the Parliaments.

So far, we have not considered the evolution of power dynamics over time. However, given the King and the Aristocrat's preference and a natural assumption that institutional improvements are more likely to be initiated by the player with more power, a positive feedback loop would easily emerge between political power and institutional improvements. Societies with slightly more powerful monarchies would be able to establish CSE-type meritocratic institutions, which then goes back to consolidate absolutism and the power of the King.

Moreover, random events at the early stage of political development could have a lasting impact on the society. Individuals could utilize temporary shocks and establish favorable institution that shapes the equilibrium in the long run. The Huang-Chao Peasant Rebellion in the mid-870s in China brought a temporary blow to the medieval aristocracy (Tackett, 2014), which might enabled the Song dynasty to formalize the CSE institution and permanently change the monarchy-aristocracy power dynamics in China. This line of argument is essentially linked to the path dependence of institutional development (Pierson, 2000; Mahoney, 2000; Thelen, 1999; Acemoglu and Robinson, 2012). According to Acemoglu, Egorov, and Sonin (2020), path dependence refers to the fact that the process of institutional change is shaped by historical conditions and initial institutional choices. Some small random shocks in the early stage of political development could have a lasting impact on the trajectory, and two similar societies with small differences might end up with dramatically different equilibrium outcome in the long-run. Even though our current model does not have a dynamic feature, a similar argument could easily be carried over to a dynamic setting.

5 Multiple Aristocrats and Political Mobility

So far in this paper, we have only considered the power dynamics between the crown and the aristocracy as a group. In this section, we extend the main model to multiple aristocrats and investigate the implication of institutions on political mobility among the Aristocrats.

We consider an extension of the main model with three players, the King (K) and two identical Aristocrats (A_1, A_2). The model setting is identical to the one in Section 4, except the presence of two Aristocrats. The equilibria are also similar to those in Section 4, except the added uncertainty of multiple Aristocrats (imperfect information with no institution or Meritocratic Institution and perfect information with Parliament). Therefore, we only offer simulation results in this section so as to foster a meaning discussion, and leave formal proofs to Appendix 8.2.

Denote the King's proposal of de jure institution as $(r^K, r^{A1}, r^{A2}) \in R^3$, with the King receiving r^K and Aristocrat A_i receiving r^{Ai}. In Stage 2, Nature determines an exogenous shock of e^i to Aristocrat A_i's de facto power. The shocks (e^1, e^2) are independent and can take only two values $e^i \in \{L = \frac{1}{\sigma}, H = \sigma\}$ with equal probabilities. In the benchmark model with no institution, the shocks remain each Aristocrat's private information. Under the Meritocratic Institution, public signals of the shocks would be sent to all players before the Aristocrats' move. Under the Parliamentary Institution, the private information would be revealed to all players when Parliament convenes.

In Stage 3, the Aristocrats can each choose to accept the proposal or to initiate a coup. We assume that no one can be neutral: if an aristocrat is not rebelling against the King, he supports the King. If any of the Aristocrats decides to initiate a coup, they have a probability of winning which is proportional to the total de facto power of the rebelling party relative to that of the King and his supporters.

Finally, if the rebelling party succeeds, each member of the rebelling party gets a portion of what is left proportional to his de facto power as a share of the total de facto power of the group. Let $P(x, y) = \frac{x}{x+y}$ denote the winning probability of the rebelling party if they have a total de facto power of x while the King and his supporters have y. If only A_1 rebels against the King, he succeeds with probability $P(e^1 w^A, w^K + e^2 w^A)$ and his expected utility is

$$R^A(e^1 w^A, w^K + e^2 w^A | e^1 w^A) = \frac{\theta w_0 e^1 w^A}{e^1 w^A + w^K + e^2 w^A}.$$

In comparison, if A_1 joins A_2 and rebel against the King together, they succeed with probability $P(e^1 w^A + e^2 w^A, w^K)$ and A_1's expected utility is

$$R^A(e^1 w^A + e^2 w^A, w^K | e^1 w^A) = \frac{\theta w_0 e^1 w^A}{e^1 w^A + e^2 w^A} \cdot \frac{e^1 w^A + e^2 w^A}{e^1 w^A + e^2 w^A + w^K}.$$

Here A_1 gets the exact same expected utility whether he rebels against the King alone or in a group holding the other's shock constant. In other words,

we assume away any synergy in coup coordination and instead focus on the difference between institutions.

In a world with no institutions, the King weighs against two options: making a high offer and keeping the Aristocrats happy regardless of the shocks, or making a low offer and risking coups from time to time. Similar to that in Section 4.1, the trade off between the two depends on parameters. The higher the uncertainty of the environment (i.e. larger σ), the less destructive the coups (i.e. larger θ), the more likely an unstable equilibrium to arise. Figure 11a gives a numeric simulation with parameter $w_0 = 9$ and $\theta = 0.6$. The orange region shows the unstable equilibrium where the Aristocrats coup with a probability equals to $\frac{3}{4}$, while the blue region the stable equilibrium where they never coups. Either case, the King will make the same offer to both Aristocrats since the latter are identical ex ante.[10] Hence, the temporary shocks to de facto power are not reflected in the allocation of rents, and political mobility among the Aristocrats are low in a world of no institution.

Under the Meritocratic Institution, similar to Section 4.2, the King will propose a conditional offer (r_L^A, r_H^A) to both Aristocrats, where $r_{s^A}^A$ is implemented when the signal turns out to be s^A. From the King's perspective, the two types of equilibrium under no institution are still available under the Meritocratic institution. However, a Meritocratic institution gives the King the additional flexibility to distinguish the high type Aristocrats from the low type. The following Figure 11b gives a numerical simulation of equilibrium under Meritocratic Institution when $w_0 = 9$, $\theta = 0.6$, $\{\pi_{e^A s^A}\} = 0.6(HH), 0.4(HL), 0.7(LL), 0.3(LH)$. The blue region indicates the stable equilibria where the Aristocrats never coup, while the yellow region demonstrates the unstable equilibria where the Aristocrats coup if they get a high value shock but a low signal. Under the Meritocratic Institution, political mobility among the Aristocrats is greatly enhanced even without changes to the de jure institution. The allocation of political rents automatically readjusts based on the signals, and further improvement on political mobility can be easily achieved by increasing the accuracy of the signaling structure.

[Figure 11 about here.]

The Parliamentary Institution, in comparison, improves on the case with no institution by providing a venue for the Aristocrats to reveal their private information and to bargain with the King. With the presence of multiple Aristocrats, it also allows the Aristocrats to bargain among themselves.

Similar to the case of no institution, the King initially proposes a de jure institution of $(r_1^K, r_2^{A1}, r_2^{A2})$. Since the Aristocrats are identical ex ante, their initial offer must be the same $r_2^{A1} = r_2^{A2}$. In Stage 2, after the realization of shocks, the Aristocrats decide as a group whether they want to renegotiate with the King; and if so, incur a personal cost of c to the King. After reaching an

[10] We assume that the King cannot discriminate based on identity alone. In other words, he cannot offer A_1 a proposal that is different from A_2 as long as A_1 and A_2 are identical except their identities.

agreement with the King, the Aristocrats then decide whether they want to renegotiate the split of the pie among themselves; and if so, incurs another cost of c due to bargaining and institutional adjustment.

It is easy to solve for the equilibrium. The dynamics between the King and the Aristocrats remains the same as that in Section 4.3. Where as for the split among the Aristocrats, they have two options: to accept the existing de jure institution and enjoy an even split no matter the shocks, or to engage in renegotiation among themselves and incur a cost of institutional adjustment. Because a Nash bargaining outcome gives them the same expected utility as an even split if and only if c is zero, the Aristocrats would prefer to avoid the cost of institutional adjustment and commit to an even split if they have the commitment power. In the absence of commitment power, the occurrence of renegotiation among the Aristocrats would depend on the parameters: the lower the renegotiation cost (i.e. smaller c), the higher the uncertainty of the environment (larger σ), the more likely for the Aristocrats to renegotiate among themselves. Therefore, political mobility among the Aristocrats would be higher under the Parliamentary Institution compare to that under no institution but lower than Meritocratic Institution.

The following Figure 12b and 12b gives a numerical comparison of political mobility under Meritocratic and Parliamentary Institution when $w_0 = 9$, $\theta = 0.6, c = 2$. In Figure 12b, The blue region indicates the equilibria with no renegotiation with the King, while the green region the ones with renegotiation with King. In both Figure 12b and 12b, the dashed lines indicate the region with political mobility among the Aristocrats. As one can see, political mobility is much higher under the Meritocratic Institution compare to that under the Parliamentary Institution.

[Figure 12 about here.]

From a theoretical perspective, an even split among the Aristocrats is preferable because it yields the same expected return as renegotiation and it avoids any cost associated with institutional adjustment or risk aversion on the aristocrats' side. In our model, the implication of risk aversion is not discussed mainly due to unnecessary mathematical complications. But it is straightforward to see that since two options yield the same expected return, the aristocrats would dislike frequent readjustment to personal shocks because of the additional risk it brought in.

Historically, political mobility tends to be lower if it is left to the aristocrats to decide how to split the pie among themselves. As shown in Section 3, political competition was consistently higher in China compare to Western Europe throughout the 19th century, despite the latter's continual effort to improve its democracy. Political competition and political mobility in Western Europe was only gradually increased over a period of several centuries, following significant advancement of Industrial Revolution, development of market economy, and improvements in communication technology. The historical observation fits well with the prediction of our model, where political mobility under Parlia-

ments would be improved with decreasing cost of renegotiation and increasing uncertainty of the environment.

6 Political Development in Medieval Time

The historical political development of many regions of the world can be understood against the implications of the model. Imperial China, given its sheer size, started out with considerable institutional uncertainty and a strong monarchy, who initiated significant institutional improvements in the form of CSE. In fact, in Imperial China, the monarchies were consistently the supporters and advocates of CSE (for more details on the history of CSE in China, see the Appendix). Aided by CSE, imperial China evolved into a stable society in the long run featuring a strong monarchy, low executive constraints, and high political competition.

A similar pattern holds true for other East Asian countries. Since the 8th century, the idea of a meritocratic bureaucracy had been introduced to regions throughout East Asia by monks and court diplomats. Similar institutions were quickly set up in Korea (958-1894), Vietnam (1075-1913), and Ryukyu (early 15th century-1609)[11], and influenced their respective political systems profoundly. However, a meritocratic system never took roots in Japan, despite the fact that the Japanese court was the first other than China to experiment with CSE (as early as the Heian period, 794AD - 1185). The CSE system faced tremendous opposition from the hereditary aristocratic families in Japan, and was abolished after a few decades of "experimentation" (Liu, 2007). Eventually, medieval Japan evolved into a society with a power structure much closer to other Western feudal countries (Duus, 1969; Lewis, 1974), despite the fact that it shared more commonalities with China in terms of culture and religion.[12]

Around the world, there were many examples of monarchies in pre-modern societies initiating institutions that advocated ideas of "governance by merit" or "promotion by merit".

Sultans in the Muslim world, for example, inherited capable bureaucracies from conquered Byzantine and Sassanid lands and introduced mamlukism— or the use of slave soldiers imported from non-Muslim lands— as the primary means of elite military recruitment. Scholars argue that an entrenched military class such as the mamluks appeared to develop in Islamic societies beginning with the ninth-century Abbasid Caliphate of Baghdad (Ayalon 1994a, 25). Over

[11] Ryukyu was invaded by Japan in 1609 and became a tribute to the Tokugawa shogunate. Some of its traditional political institution was abolished since the invasion.

[12] Historians have long argued that political institutions in medieval Japan "closely resembled those of feudal Europe" (Duus 1969, 10), emphasizing in both cases the importance of "heavily armed horsemen who became the elite fighting forces of the time" (Lewis 1974, 26). Despite the existence of important differences between the two contexts, there is evidence that the introduction of feudal institutions in Japan was associated with longer ruler duration. Using data on ruler duration from Morby (1989), Blaydes and Chaney (2013) finds a break in the Japanese stability trend around 1142 AD, a date quite close to when historians argue Japanese feudalism emerged.

time, Mamluks became a powerful military knightly class in various societies that were controlled by Muslim rulers, and mamlukism became a defining feature of Muslim polities for a period of more than 800 years (Crone 2003, 79).

Mamluks were purchased from non-Muslim lands at a young age and went through years of rigorous military training.[13] A typical Mamluk career might begin in the ranks and then progress through the grades of Amir of ten (number of Mamluks in his retinue), Amir of forty, and Amir of one hundred. In addition to these promotions, a Mamluk might receive positions in the military-political administration, from posts as governors of small towns or larger cities to commander of the army or even vice sultan. Particularly in Egypt, but also in the Levant, Mesopotamia, and India, mamluks held political and military power. In some cases, they attained the rank of sultan, while in others they held regional power as emirs or beys.[14]

There is element of loyalty as well as meritocracy incorporated into the operation of Mamlukism. In fact, various measures were put in place to segregate mamluks from the local population and to prevent political reproduction within the mamluks, which worked well at least in the early years. Every mamluk had to graduate from austere training, and proved skills of war were an important criteria for promotion. As freeborn Muslims, the sons of Mamluks were theoretically excluded from the system. In actuality, upon reaching the sultanate many Mamluks attempted to pass the office on to their sons, but with substantial difficulties.[15] Many of the sons of Mamluks, known collectively as *awlad al-nas* ("sons of the people," that is, of those who matter), pursued careers in other endeavors (Martin, 2016).

Scholars argue that mamlukism enabled Muslim rulers to circumvent the emergence of the type of landed aristocracy that was prominent in the history of Europe. Local elites in the Muslim world did not serve as the source of elite military recruitment and, thus, were poorly positioned to impose the types of constraints on the executive that became evident in Europe (Blaydes and Chaney, 2013). Mamlukism enabled the ruler to bypass local elites in the raising of a military, leading to a concentrated, but brittle, form of power held by Muslim sovereigns compared to their European counterparts (Blaydes and Chaney, 2013).

Comparing mamlukism of the Muslim world to the CSE of East Asia, the former did have some meritocratic elements but gave much more emphasis to loyalty and patronage. From a theoretical perspective, the signalling structure of the CSE was much more objective and informative than that of mamlukism. And as predicted by our model, a meritocratic institution with noisy signaling structure could have a negative impact on political stability, even though it still

[13] Both the sultan and leading Mamluk amirs would purchase Mamluks of their own.

[14] Most notably, mamluk factions seized the sultanate centered on Egypt and Syria, and controlled it as the Mamluk Sultanate (1250–1517).

[15] While we thus see apparent "dynasties" of sultans from the same lineage— the most famous being that descended from alMalik al-Nasir Muhammad ibn Qalawun (third reign, 1309–1340)— most of these sultans were in fact puppets, controlled by the senior Mamluk amirs who were maneuvering to take the throne themselves (Martin, 2016).

strengthens the power of the King. Indeed, Figure 13a shows that political instability of the Muslim world seemed to be on the rise compare to that of China and Western Europe. Moreover, Figure 13b compares the political institution of the Muslim world against that of China and Western Europe based on the Polity IV project. It is interesting to see that the political equilibrium of the Muslim world resided somewhere between the Chinese and the Western European equilibria. Especially at the beginning of the 19th century, the Muslim world had lower executive constraints and higher political competition compare to Western Europe, but similar level of executive constraints and lower political competition compare to China.

[Figure 13 about here.]

In Europe, bureaucracies had a much less prominent role in the history of political development, but it was not because of a lack of idea. Meritocratic bureaucracies were widely admired by enlightened scholars and intellectuals. Western perception of China even in the 18th century admired the Chinese bureaucratic system as favourable over European governments for its seeming meritocracy; and Chinese bureaucracy was admired by many including Voltaire and François Quesnay.

Most bureaucratic institutions in Europe were set up much later than China and Central Asia and long after democracy was consolidated. There were a few examples of monarchies attempting to reform the bureaucracy. In his book *Political Order and Political Decay*, Francis Fukuyama argues that Prussian bureaucracy was the model of modern bureaucracy. Fukuyama wrote that, "When Max Weber wrote his famous description of modern bureaucracy early in the twentieth century, he was not thinking of the American bureaucracy... Weber was thinking, rather, of the bureaucracy of his native Germany... In Brandenburg-Prussia, the opposite happened (England model: parliament had the power to block the king): the estates were weak and divided, and a series of resourceful and strong-minded rulers— the Great Elector Frederick William, King Frederick William I of Prussia, and Frederick II- succeeded in progressively stripping them of political power and concentrating it in the hands of a centralized royal administration... The shift from a patrimonial to a modern bureaucracy in Prussia took place only in stages between 1640 and the conclusion of the Stein-Hardenberg reforms in the early nineteenth century. The Great Elector began the process in the second half of the seventeenth century with the separation of the civil and military bureaucracies, and the organization of the former into a series of technical *Regierungen* or councils. The need to raise resources made the war commissariat the primary instrument of centralization; its ability to administer an increasingly complex taxation system and its function as a military supply administration drove its evolution into the nation's chief economic policy body" (Fukuyama, 2014).

Another yet somewhat less successful example is France. In her book *Private ambition and political alliances*, historian Sara Chapman evaluates the bureaucratic system in France under Louis XIV (the King of France from 1638 to

1715). She argues that up to Louis XIV, instead of strictly relying on formal bureaucratic institutions, informal political institutions still dominated the French court. Besides kinship and marriage, personal connections and patron-client network was especially popular in France. Chapman also recognizes that she was not the first one to notice the importance of informal connections in medieval France. She wrote, "Other historians of France, such as William Beik, James Collins, Sharon Kettering, Roger Mettam, and Orest Ranum, have continued to explore the changing relationship between these networks of political authority created by political patrons and clients as well as the impact of the networks on the evolving French state." Why did the French court rely heavily on informal political networks to extend its authority to the local levels? Chapman and many historians believe that it was because France was not really "absolute", and the royal authority was much weaker than we imagined. King and ministers relied on "elites for the functioning of the state and the restitution of order..... The king and ministers, had a co-operative relationship with most local elites in the provinces who, in turn, had their own local clienteles" (Chapman and Chapman, 2004).

In summary, many regions of the world had made attempts at meritocratic institutions during the medieval time. Ironically, it seems that it was the strong monarchies that were able to break the hold of the local nobility and establish meritocratic institutions; and these institutions, in turn, helped to consolidate absolutism in these countries and potentially led to less favorable conditions for democratization in the long run.

7 Conclusion

This paper investigates a worldwide phenomenon of "political divergence" among historical states, with a focus on the comparison between China and Western Europe. During the 8th to 10th century, both Western Europe and China achieved political stability but through dramatically different routes. In Western Europe, feudal representation put constraints on the crown and the parliamentary meetings offered a venue for peaceful conflict resolution. Whereas in China and some other countries in East Asia such as Korea, the creation of a state bureaucracy, the establishment of exam-based meritocracy, and the subsequent decline of aristocratic politics helped consolidate the power of the King and eventually led to absolutism. This paper provides empirical evidence to document this *great political divergence*, and presents results showing that both parliamentary meetings and the establishment of CSE were associated with improvements in political stability.

Motivated by the empirical evidence, we propose a theory to understand the relationship between institutions and monarchy-aristocracy power balance. We argue that a critical source of instability for historical states is a mismatch between de jure political institutions and de facto political power. There could be stochastic shocks to de facto political power, which may not be reflected in de jure institutions in a timely manner. This inevitably leads to political

instabilities.

We argue that institutional improvements, such as the establishment of parliaments or meritocratic bureaucracies, are mechanisms to reduce the mismatch between de jure institution and de facto power. We analyze a two-player game between the King and the Aristocrat, where the outcome of a conflict between the two is determined by their de factor political power. We use the model to investigate the conditions under which institutional improvement occurs.

The model provides two implications. First, when coups are moderately destructive, both parliamentary system and meritocratic bureaucracies enhances political stability. Secondly, and maybe ironically, the monarchy always weakly prefers meritocracy while aristocrats have incentive to push for parliamentary system. This accords well with the history of political development in medieval time. Despite positive impact meritocracy might have on the general population, it was the monarchies that had the incentive to push for meritocracy in these societies; and meritocratic institutions, in turn, strengthened the power of the monarchies and helped consolidate absolutism in these countries.

One missing element in the general literature on political development is the role and functions of bureaucracy. In this paper, we strive for a truly comparative analysis of meritocratic bureaucracy against more thoroughly studied institution, such as parliamentary system, based on a game theoretical framework. By doing so, we hope to provide a perspective on meritocratic bureaucracy which is dramatically different from that of enlightened intellectuals or scholars of modern bureaucracies.

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8 Appendix

8.1 More Historical Details on the Civil Service Examination System in China

In China, similar to the rise of executive constraints around 9th or 10th centuries in Europe, China in the 8th century went through a profound transformation. There is an overwhelming consensus among China historians that the most important development during this period was the establishment, formalization and expansion of civil service examination (CSE) system. We will show that the rise of meritocracy served the same stabilizing function as the European parliamentary system. The dating of the establishment of the CSE may not be precise. As early as the Western Han dynasty (206 BCE–9 BCE), a version of the CSE already existed, but it was small in scale and informal in operation. Prior to the Sui (580-618), candidates were first recommended and then tested. By necessity, recommendations relied on personal knowledge and relationships.

The consensus among historians is that the CSE was formally inaugurated during the Sui dynasty, around 605. At the time of its establishment, most of the candidates were drawn from the capital city and nearby regions, such as Chang'an and Luoyang, and from elite aristocratic families. The person who broke the aristocratic capture of the CSE and of the bureaucracy as a whole, according to Elman (1991), was Wu Zetian. Wu was an extraordinary individual: She was the only female emperor in all of Chinese history. Empress Wu (690–705), from an ultimate outsider status, needed an instrument to break the power of the entrenched interests who were hostile to her. That instrument was the CSE.

Empress Wu expanded both the scale and the scope of the CSE in order to decimate the Chinese aristocracy. The method by which she accomplished this task is both nuanced and direct. She moved the capital from Chang'an in the northwest to Luoyang in the north, moving the center of political gravity from the aristocratically strong northwest to the north, which was populated by commoners. She actively recruited people from northern China to participate in the CSE at the expense of the aristocratic incumbents from the northwestern part of the country. One of the lasting contributions of the Sui dynasty was the replacement of the recommendation system by an application-based CSE, but the Sui dynasty also instituted many restrictions. For example, members of merchant households were not allowed to participate in the CSE. Empress Wu changed the CSE from a conditional open-access system to one that was nearly universally open. Members of merchant households were allowed to take the CSE.

The nuance in her method was her elevation of one type of examination (known as the Jinshi) over another type of examination (known as the Mingjing). At the time of the Tang dynasty, the Jinshi examination focused heavily on essay compositions and poetry writing. The Mingjing examination focused heavily on memorizing classical texts. Thus, these two categories of examinations sorted on different types of capabilities. The Jinshi examination—not to be confused

with its rote memorization namesake during the Ming dynasty—selected on the basis of innate talent and creativity. The Mingjing examination was biased in favor of sheer memorization. By elevating the Jinshi examination, Empress Wu was biasing the selection in favor of creative talent. This sorting mechanism led to another difference, a difference in the socioeconomic nature of examinees. The Mingjing examinations implicitly favored those households endowed with assets, such as those rich, privileged incumbent aristocratic households possessing books and classical texts. By downplaying the Mingjing examinations, Empress Wu broadened participation by drawing candidates from the lower socioeconomic commoner classes (Paludan, 1998). (We note here that CSE, in its entire existence, was only open to the male gender only.)

If the European parliamentary system codified the power division and the rights allocations between the monarchs and landed aristocracy, CSE led to a demolition of an autonomous landed aristocracy altogether. CSE did so by "democratizing" access to political power, broadening the pipeline to bureaucracy to the commoners, and diluting the aristocratic access to political power in the process. In addition, CSE imposed procedures that further limited access to the highest echelons of power on the part of wealth-holding class.

These two functions together, the access and control functions, might have contributed to the aforementioned long and rising duration of rulers and to the stability of the imperial system as a whole.

CSE lowered the entry barrier through meritocracy. Chinese imperial regimes were able to recruit human capital into its bureaucracy with less regard to lineage, family backgrounds, and economic status of individuals, all of which were heavily hereditary in pre-modern Europe. This famous, if sometimes exaggerated, meritocratic function earned CSE admirations from many European enlightenment thinkers such as Montesquieu and Rousseau. Our claim is that meritocracy also performed a political function.

One way to conceptualize CSE's political function is to view it from the perspective of the selectorate theory developed by De Mesquita et al. (2005). According to the selectorate theory, a rational autocrat is motivated to increase the size of the nominal selectorate—defined as those who are potentially eligible to join the political establishment. This selectorate logic does not hinge on increasing the size of the political system but on increasing the size of the pipeline to the political system. CSE, by inducing investments in basic, functional and ideological literacy on the part of the male population, increased the size of the nominal selectorate, which in turn increased the costs of defections by the incumbents. In economics terminology, low entry barriers to the bureaucracy lead to perfect competition among bureaucrats and make each bureaucrat perfectly substitutable. Another channel CSE could have contributed to the enhanced stability is by introducing newcomers to the system who have interests different from the aristocrats and hence makes collective actions against the crown more difficult. The result is enhanced loyalty to the ruler.

CSE "democratized" access to bureaucratic recruitment, and hence, strengthened political control on the members of the bureaucracy. The access function of CSE altered the incentives of the masses away from resorting to violence as

shown by Bai and Jia (2016), but also altered the incentives of the political elites away from challenging and defecting from the emperor. The political incentive effect modelled by us and the social mobility effects modelled by other scholars reinforced one another.

8.2 Proof of Theorems

This section provides the proof for theorems in Section 4 and 5.

8.2.1 Proof for Section 4.1

Theorem 8.1 (Equilibrium Under No Institution)**.** *For the benchmark game with no institution,*

- *If $\theta \leq \frac{1}{2}$, it has a unique stable equilibrium, where the King proposes $r^A = w_0\theta P(\sigma w^A, w^K) - w^A$ and the Aristocrat never coups.*
- *If $\theta > \frac{1}{2}$, for every w^A, w^K, there exist a $\tilde{\sigma}$ such that when $\sigma \leq \tilde{\sigma}$, the game has a unique stable equilibrium similar to the one described above. When $\sigma > \tilde{\sigma}$, the game has a unique unstable equilibrium, where the King proposes $r^A = w_0\theta P(\frac{w^A}{\sigma}, w^K) - w^A$ and the Aristocrat initiates a coup if and only if he receives a low value shock.*

Proof. The benchmark game could have three types of equilibrium,

1. $\beta_L = \beta_H = 0$, $r^A = w_0\theta P(\sigma w^A, w^K)$;
2. $\beta_H = 1, \beta_L = 0$, $r^A = w_0\theta P(\frac{w^A}{\sigma}, w^K)$;
3. $\beta_L = \beta_H = 1$, $r^A = -w^A$;

Denote the King's expected utility under either type of equilibrium as $EU^K i, i = 1, 2, 3$. First, $EU^K 3 - EU^K 2 = -\frac{w_0(1-\theta)}{2}$. Hence, as long as $\theta \leq 1$, $EU^K 3 \leq EU^K 2$. Secondly, $EU^K 1 - EU^K 2 = \frac{w_0}{2}\left[(1-\theta) - \theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)]\right]$. Let $F(\sigma, w^A, w^K) = P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)$. Since $F(\sigma, w^A, w^K)$ increases in σ monotonically, for every pair of (w^A, w^K), $EU^K 1 - EU^K 2$ reaches its minimum $\frac{w_0}{2}(1-2\theta)$ at $\sigma = +\infty$ and its maximum $\frac{w_0}{2}(1-\theta) > 0$ at $\sigma = 1$.

Hence, when $\theta \leq \frac{1}{2}$, the benchmark game only has a type 1 stable equilibrium. when $\theta > \frac{1}{2}$, for every w^A, w^K, there exist a $\tilde{\sigma}$ s.t. $F(\tilde{\sigma}, w^A, w^K) = \frac{(1-\theta)}{\theta}$. When $\sigma < \tilde{\sigma}$, the benchmark game has a type 1 stable equilibrium; and when $\sigma > \tilde{\sigma}$, the game has a type 2 unstable equilibrium where the Aristocrat coups if and only if he receives a high value shock. □

8.2.2 Proof for Section 4.2

Theorem 8.2 (Meritocratic Equilibrium)**.** *Under the Meritocratic Institution, the institution sends a public signal of $s(e^A) = s^A$.*

1. *When* $\theta \leq \frac{\pi_{HL}}{\pi_{LL}+\pi_{HL}}$, *the game has a unique stable equilibrium, where the King proposes an unconditional offer* $r^A = w_0\theta P(\sigma w^A, w^K) - w^A$ *regardless of the signal, and A never coups.*

2. *When* $\frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}} \geq \theta > \frac{\pi_{HL}}{\pi_{LL}+\pi_{HL}}$, *there exist two types of equilibrium. For every* w^A, w^K, *there exist a* $\tilde{\sigma}_1$ *such that*

   (a) *When* $\sigma \leq \tilde{\sigma}_1$, *the game has a unique stable equilibrium similar to 1.(a).*

   (b) *When* $\sigma > \tilde{\sigma}_1$, *the game has a unique unstable equilibrium, where the King offers* (r_H^A, r_L^A) *conditional on the signal, with* $r_H^A = w_0\theta P(\sigma w^A, w^K) - w^A$, $r_L^A = w_0\theta P(\frac{w^A}{\sigma}, w^K) - w^A$, *and the coup probability equals to* $\frac{1}{2}\pi_{HL}$.

3. *When* $\theta > \frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}}$, *there exist three types of equilibrium. For every* w^A, w^K, *there exist a pair of* $(\tilde{\sigma}_1, \tilde{\sigma}_2)$ *such that*

   (a) *When* $\sigma \leq \tilde{\sigma}_1$, *the game has a stable equilibrium similar to 1.(a).*

   (b) *When* $\tilde{\sigma}_1 < \sigma < \tilde{\sigma}_2$, *it has a unique unstable equilibrium similar to 2.(b).*

   (c) *When* $\sigma > \tilde{\sigma}_2$, *it has an unstable equilibrium, where the King proposes an unconditional offer* $r_H^A = r_L^A = w_0\theta P(\frac{w^A}{\sigma}, w^K) - w^A$, *and the coup probability equals to* $\frac{1}{2}$.

Proof. For the same reason as outlined the in previous session, the equilibrium will make the Aristocrat indifferent between coup or not at some level of (e^A, s^A). There could be six types of equilibrium.

1. $\beta_{HH} = \beta_{HL} = \beta_{LH} = \beta_{LL} = 0$, and
   $r_H^A = r_L^A = w_0\theta P(\sigma w^A, w^K) - w^A$;

2. $\beta_{HL} = 1, \beta_{HH} = \beta_{LH} = \beta_{LL} = 0$, and
   $r_H^A = w_0\theta P(\sigma w^A, w^K) - w^A$, $r_L^A = w_0\theta P(\frac{w^A}{\sigma}, w^K) - w^A$;

3. $\beta_{HL} = \beta_{HH} = 1, \beta_{LH} = \beta_{LL} = 0$, and
   $r_H^A = r_L^A = w_0\theta P(\frac{w^A}{\sigma}, w^K) - w^A$;

4. $\beta_{HL} = \beta_{LL} = 1$, $\beta_{HH} = \beta_{LH} = 0$, and
   $r_H^A = w_0\theta P(\sigma w^A, w^K) - w^A$, $r_L^A = -w^A$;

5. $\beta_{HH} = \beta_{HL} = \beta_{LL} = 1$, $\beta_{LH} = 0$, and
   $r_H^A = w_0\theta P(\frac{w^A}{\sigma}, w^K) - w^A$, $r_L^A = -w^A$;

6. $\beta_{HH} = \beta_{HL} = \beta_{LH} = \beta_{LL} = 1$, and $r_H^A = r_L^A = -w^A$;

The King chooses the optimal (r_H^A, r_L^A) to achieve his preferred equilibrium. Let $EU^K i$ denote the King's expected utility under type i equilibrium. Among the five potential types of equilibrium, $EU^K 3 - EU^K 6 = \frac{w_0}{2}(1-\theta) > 0$ as long

as $\theta < 1$, $EU^K2 - EU^K4 = EU^K3 - EU^K5 = \frac{w_0}{2}\pi_{LL}(1-\theta) > 0$ as long as $\theta < 1$ and $\pi_{LL} > 0$. Hence, type 4,5, and 6 will never be the equilibrium.

$EU^K1 - EU^K2 = \frac{w_0}{2}[\pi_{HL}(1-\theta) - \theta\pi_{LL}F(\sigma, w^A, w^K)]$, where $F(\sigma, w^A, w^K) = P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)$ as defined in Section 4.1. When $\theta \leq \frac{\pi_{HL}}{\pi_{LL}+\pi_{HL}}$, $EU^K1 > EU^K2$ always holds true. When $\theta > \frac{\pi_{HL}}{\pi_{LL}+2\pi_{HL}}$, there exist $\tilde{\sigma}_1$, s.t. $F(\tilde{\sigma}_1, w^A, w^K) = \frac{\pi_{HL}(1-\theta)}{\theta\pi_{LL}}$. For any $\sigma < \tilde{\sigma}_1$, $EU^K1 > EU^K2$; and $EU^K1 < EU^K2$ otherwise.

$EU^K2 - EU^K3 = \frac{w_0}{2}[\pi_{HH}(1-\theta) - \theta\pi_{LH}F(\sigma, w^A, w^K)]$. When $\theta \leq \frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}}$, $EU^K2 > EU^K3$ always holds true. When $\theta > \frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}}$, there exist $\tilde{\sigma}_2$, s.t. $F(\tilde{\sigma}_2, w^A, w^K) = \frac{\pi_{HH}(1-\theta)}{\theta\pi_{LH}}$. For any $\sigma < \tilde{\sigma}_2$, $EU^K2 > EU^K3$; and $EU^K2 < EU^K3$ otherwise.

Because $\pi_{LH} < \frac{1}{2} < \pi_{HH}$, we have $\frac{\pi_{HL}(1-\theta)}{\theta\pi_{LL}} < \frac{(1-\theta)}{\theta} < \frac{\pi_{HH}(1-\theta)}{\theta\pi_{LH}}$. Since $F(\sigma, w^A, w^K)$ increases in σ, we have $\tilde{\sigma}_1 < \tilde{\sigma} < \tilde{\sigma}_2$.

In summary, when When $\theta \leq \frac{\pi_{HL}}{\pi_{LL}+\pi_{HL}}$, the game under CSE Institution has only one equilibrium, type 1. When $\frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}} \geq \theta > \frac{\pi_{HL}}{\pi_{LL}+\pi_{HL}}$, it has two types of equilibrium, type 1 and 2. And When $\theta > \frac{\pi_{HH}}{\pi_{LH}+\pi_{HH}}$, there exist three types of equilibrium, type 1, 2, and 3. □

Corollary 8.2.1 (Stability Improvement Under Meritocratic Institution)**.** *When $\theta > \frac{1}{2}$, the Meritocratic Institution decreases stability when σ is between $\tilde{\sigma}_1$ and $\tilde{\sigma}$, and increases stability when σ is between $\tilde{\sigma}$ and $\tilde{\sigma}_2$.*

Proof. Comparing Theorem 4.1 and 4.2, we have stability of the game decreases when $\sigma \in [\tilde{\sigma}_1, \tilde{\sigma}]$ and increases when $\sigma \in [\tilde{\sigma}, \tilde{\sigma}_2]$. □

Corollary 8.2.2 (The Selection of the Aristocrat)**.** *The King is more likely to propose a conditional offer when the signal is more informative (i.e. larger π_{LL} or larger π_{HH}).*

Proof. Given any θ, there exist $\tilde{\sigma}_1$ and $\tilde{\sigma}_2$ ($\tilde{\sigma}_2$ could be $+\infty$) such that the King proposes conditional offers when $\sigma \in [\tilde{\sigma}_1, \tilde{\sigma}_2]$. According to the proof of Theorem 4.1 and 4.2, $F(\tilde{\sigma}, w^A, w^K) = \frac{(1-\theta)}{\theta}$, $F(\tilde{\sigma}_1, w^A, w^K) = \frac{(1-\theta)(1-\pi_{HH})}{\theta\pi_{LL}}$, and $F(\tilde{\sigma}_2, w^A, w^K) = \frac{(1-\theta)\pi_{HH}}{\theta(1-\pi_{LL})}$. Since $F(\sigma, w^A, w^K)$ increases in σ, we have both $\tilde{\sigma} - \tilde{\sigma}_1$ and $\tilde{\sigma}_2 - \tilde{\sigma}$ increasing in π_{LL} and π_{HH}. Hence, the parametric space where King makes conditional offer expands when either π_{LL} or π_{HH} increases. □

Corollary 8.2.3 (Stability Improvement Under Meritocratic Institution)**.** *The Meritocratic Institution is more likely to improve political stability when the signals are more informative (i.e. larger π_{HH} or larger π_{LL} or both).*

Proof. Similar to the proof above, stability will improve under Meritocratic Institution when σ is between $[\tilde{\sigma}, \tilde{\sigma_2}]$. Here $\tilde{\sigma_2}$ is decided by $F(\tilde{\sigma}_2, w^A, w^K) = \frac{(1-\theta)\pi_{HH}}{\theta(1-\pi_{LL})}$. Since $F(\sigma, w^A, w^K)$ increases in σ, $\tilde{\sigma}_2 - \tilde{\sigma}$ increases in π_{LL} and π_{HH}. □

8.2.3 Proof for Section 4.3

Theorem 8.3 (Parliamentary Equilibrium)**.** *Under the Parliamentary Institution,*

- *if* $c \geq w_0\theta\left(P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)\right)$*, there exist a unique equilibrium where the King proposes* $r_1^A = \frac{w^K - w^A - c + w_0\theta(2P(\sigma w^A, w^K) - 1)}{2}$*, and the Aristocrat always accepts the de jure institution regardless of his shock.*
- *If* $c < w_0\theta\left(P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)\right)$*, there exist a unique equilibrium where the King proposes* $r_1^A = \frac{w^K - w^A - c + w_0\theta(2P(\frac{w^A}{\sigma}, w^K) - 1)}{2}$*, the Aristocrat accepts the de jure institution when he gets a low shock, and demands renegotiation when he gets a high shock.*

Proof. In Stage 2, if the Aristocrat accepts the initial proposal r_1^A, the two players will each get

$$U^A(accept) = w^A + r_1^A \tag{9}$$
$$U^K(accept) = w^K - r_1^A \tag{10}$$

If he renegotiates with the King, the two players will each get

$$U^A(reneg|e^A) = w_0\theta P(e^A w^A, w^K) + \frac{w_0 - c - w_0\theta}{2} \tag{11}$$
$$U^K(reneg|e^A) = -w_0\theta P(e^A w^A, w^K) + \frac{w_0 - c + w_0\theta}{2} \tag{12}$$

Assume that the Aristocrat will accept the initial proposal if he is indifferent between accepting not. Then the King is optimizing among the following three scenario:

1. The King proposes r_1^A such that $U^A(accept) = U^A(reneg|e^A = H)$, and the Aristocrat accepts the initial offer regardless of his shock. In this case,

$$U^K = -w_0\theta P(\sigma w^A, w^K) + \frac{w_0 + c + w_0\theta}{2}$$

$$U^A = w_0\theta P(\sigma w^A, w^K) + \frac{w_0 - c - w_0\theta}{2}$$

2. The King proposes r_1^A such that $U^A(accept) = U^A(reneg|e^A = L)$, and the Aristocrat demands renegotiation when $e^A = H$. In this case,

$$U^K = \frac{w_0 - w_0\theta(P(\frac{w^A}{\sigma}, w^K) + P(\sigma w^A, w^K) - 1)}{2}$$

$$U^A = \frac{w_0 - c + w_0\theta(P(\frac{w^A}{\sigma}, w^K) + P(\sigma w^A, w^K) - 1)}{2}$$

3. The King proposes r_1^A such that $U^A(accept) < U^A(reneg|e^A = L)$, and the Aristocrat renegotiates to get a new offer r_2^A regardless of his shock. In this case,

$$U^K = \frac{w_0 - c - w_0\theta(P(\frac{w^A}{\sigma}, w^K) + P(\sigma w^A, w^K) - 1)}{2}$$

Hence, depending on parameter c and $w_0\theta\left(P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)\right)$, the King optimally chooses among the three types of equilibrium.

- if $c \geq w_0\theta\left(P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)\right)$, there exist a unique equilibrium where the King proposes $r_1^A = \frac{w^K - w^A - c + w_0\theta(2P(\sigma w^A, w^K) - 1)}{2}$, and the Aristocrat always accepts the offer regardless of his shock.
- If $c < w_0\theta\left(P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)\right)$, there exist a unique equilibrium where the King proposes $r_1^A = \frac{w^K - w^A - c + w_0\theta(2P(\frac{w^A}{\sigma}, w^K) - 1)}{2}$, the Aristocrat accepts the offer when he gets a low shock, and demands renegotiation when he gets a high shock.

□

Corollary 8.3.1 (King's Preference)**.** *The King prefers the Parliamentary Institution over no institution if and only if*

$$c > max\{w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)], w_0(1-\theta)\}.$$

Proof. Consider the King's expected utility. There are two types of equilibrium under no institution, and two types of equilibrium under Parliamentary Institution.

$$EU^K_{None} = \begin{cases} w_0 - w_0\theta P(\sigma w^A, w^K) & \text{if Stable Eqm} \\ \frac{w_0 + w_0\theta - w_0\theta[P(\frac{w^A}{\sigma}, w^K) + P(\sigma w^A, w^K)]}{2} & \text{if Unstable Eqm} \end{cases} \tag{13}$$

$$EU^K_{Parl} = \begin{cases} -w_0\theta P(\sigma w^A, w^K) + \frac{w_0 + c + w_0\theta}{2} & \text{if No Renegotiation} \\ \frac{w_0 + w_0\theta - w_0\theta[P(\frac{w^A}{\sigma}, w^K) + P(\sigma w^A, w^K)]}{2} & \text{if Renegotiation} \end{cases} \tag{14}$$

Compare the four equations above, we have the following:

1. $EU^K(No\ Renegotiation|Parl) > EU^K(Stable\ Eqm|No\ Inst)$ holds if and only if $c > w_0(1-\theta)$.
2. $EU^K(No\ Renegotiation|Parl) > EU^K(Unstable\ Eqm|No\ Inst)$ holds if and only if $c > w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)]$.
3. The King's expected utility under an unstable equilibrium is always the same as that under a parliamentary equilibrium with renegotiation.

4. The condition that allows the King to enjoy a higher expected utility under a parliamentary equilibrium with renegotiation compare to a stable equilibrium under no institution also makes the stable equilibrium infeasible.

Therefore, in summary, the King will have a higher expected utility under parliamentary institution compare to no institution if and only if
$c > max\{w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)], w_0(1-\theta)\}$. □

Corollary 8.3.2 (Aristocrat's Preference)**.** *The Aristocrat prefers Parliamentary Institution over no institution if one of the following is satisfied:*

- *When $c < w_0(1-\theta)$, the Aristocrat will prefer Parliament over no institution if σ s.t. $P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) > \frac{1-\theta}{\theta}$ or $P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) < max\{\frac{c}{w_0\theta}, \frac{w_0(1-\theta)-c}{w_0\theta}\}$.*
- *When $c \geq w_0(1-\theta)$, the Aristocrat will prefer Parliament over no institution if σ s.t. $\frac{c}{w_0\theta} > P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) > max\{\frac{1-\theta}{\theta}, \frac{c-w(1-\theta)}{w_0\theta}\}$.*

Proof. Consider the Aristocrat's expected utility.

$$EU^A_{None} = \begin{cases} w_0\theta P(\sigma w^A, w^K) & \text{if Stable Eqm} \\ \frac{w_0\theta}{2}\left[P(\sigma w^A, w^K) + P(\frac{w^A}{\sigma}, w^K)\right] & \text{if Unstable Eqm} \end{cases} \tag{15}$$

$$EU^A_{Parl} = \begin{cases} w_0\theta P(\sigma w^A, w^K) + \frac{w_0 - c - w_0\theta}{2} & \text{if No Renegotiation} \\ \frac{w_0 - c - w_0\theta + w_0\theta[P(\frac{w^A}{\sigma}, w^K) + P(\sigma w^A, w^K)]}{2} & \text{if Renegotiation} \end{cases} \tag{16}$$

Compare the four equations above, we have the following:

1. When $c < w_0(1-\theta) - w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)]$, $EU^A_{Parl} > EU^A_{None}$ regardless of the type of equilibrium.
2. When $w_0(1-\theta) > c \geq w_0(1-\theta) - w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)]$, the Aristocrat always has higher expected utility under Parliaments except $EU^A_{Parl}(Renegotiation) \leq EU^A_{None}(Stable\ Eqm)$.
3. When $w_0(1-\theta) \leq c < w_0(1-\theta) + w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)]$, the Aristocrat always has lower expected utility under Parliament except $EU^A_{Parl}(No\ Renegotiation) \leq EU^A_{None}(Unstable\ Eqm)$.
4. When $c \geq w_0(1-\theta) + w_0\theta[P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K)]$, the Aristocrat always has lower expected utility under Parliament.

Therefore, in summary,

- When $c < w_0(1-\theta)$, the Aristocrat will prefer Parliament over no institution if σ s.t. $P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) > \frac{1-\theta}{\theta}$ or $P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) < max\{\frac{c}{w_0\theta}, \frac{w_0(1-\theta)-c}{w_0\theta}\}$.

- When $c \geq w_0(1-\theta)$, the Aristocrat will prefer Parliament over no institution if σ s.t. $\frac{c}{w_0\theta} > P(\sigma w^A, w^K) - P(\frac{w^A}{\sigma}, w^K) > max\{\frac{1-\theta}{\theta}, \frac{c-w(1-\theta)}{w_0\theta}\}$.

□

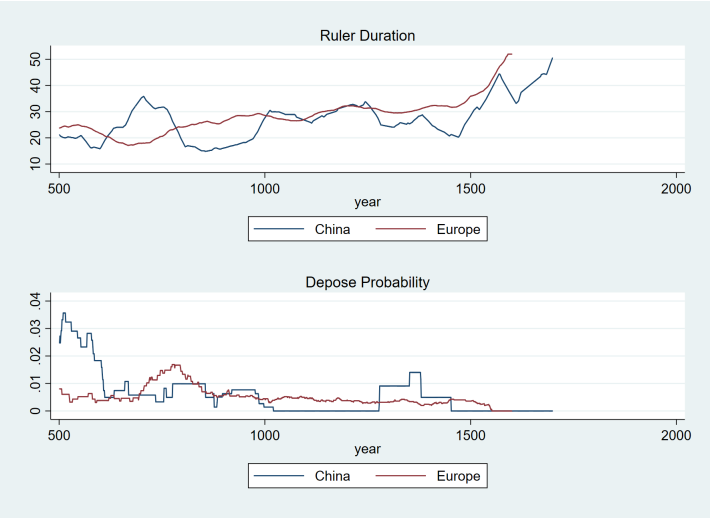
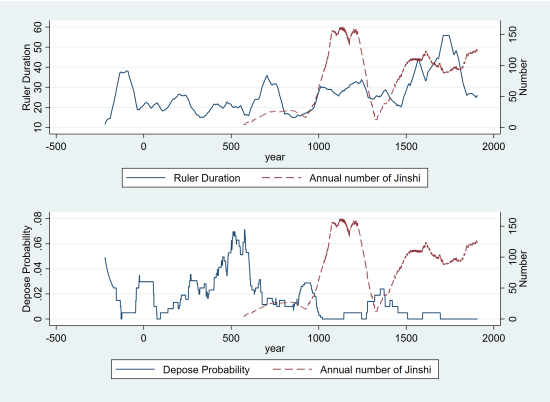
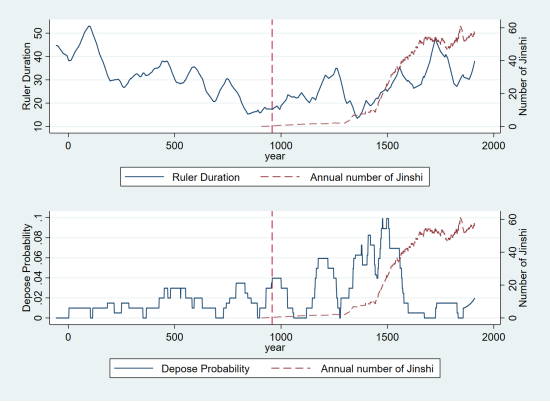


Figure 1: Political Stability of China vs. Europe

Note: The above picture shows the 100-year moving average of ruler duration and annual probability of ruler being deposed. The data on China is collected by the author based on Chronologies of Chinese Emperors and Their Families edited by Du (1995) and other supporting sources, while the data on other countries are based on Morby (1989).



(a) China



(b) Korea

Figure 2: Political Stability and CSE in East Asia

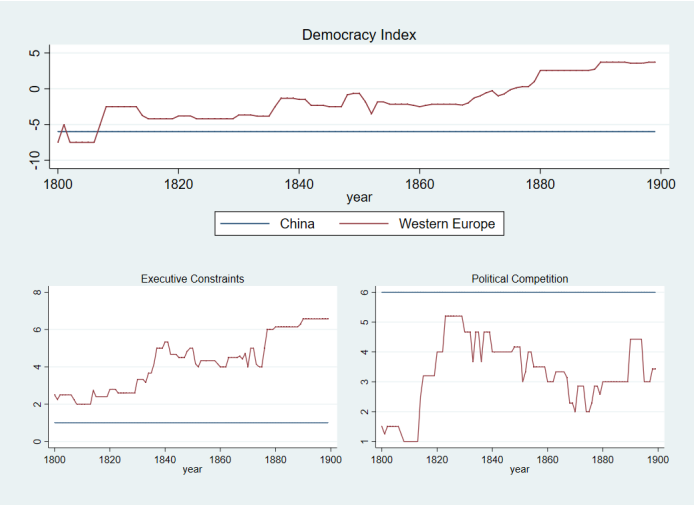


Figure 3: Institutional Comparison of China and Europe in the 19th Century

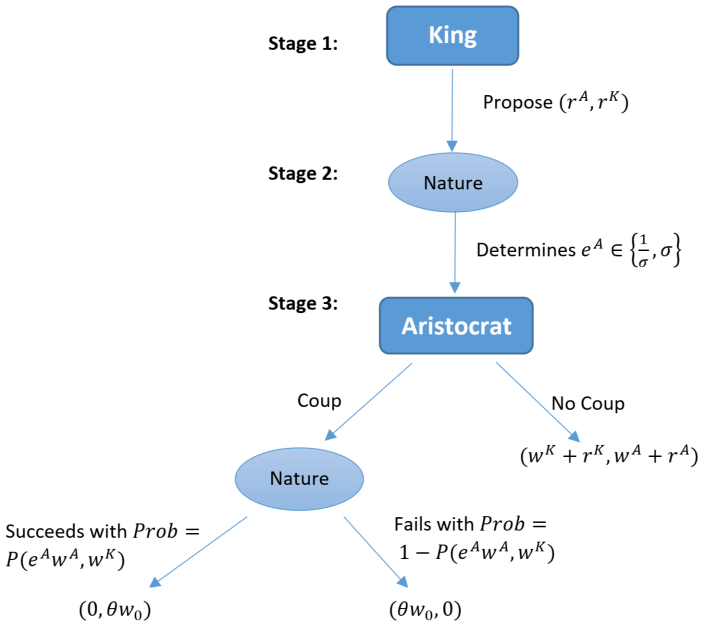


Figure 4: Timeline of the Benchmark Game

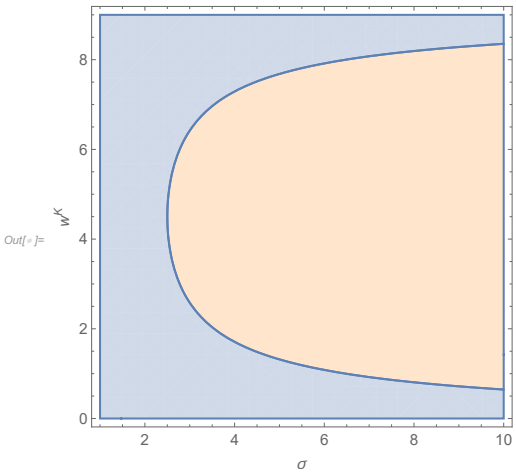


Figure 5: Equilibrium of the Benchmark Game

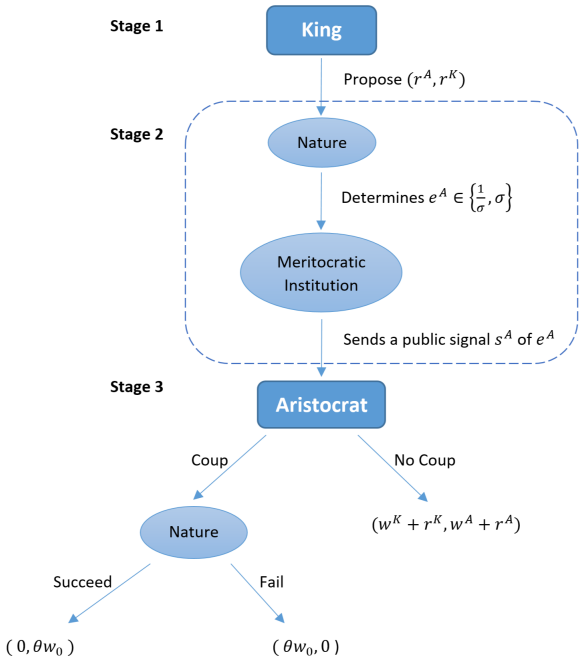


Figure 6: Timeline of the Game under Meritocratic Institution

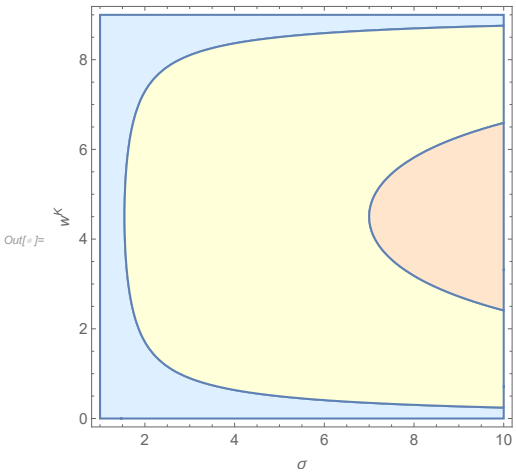


Figure 7: Equilibrium Under Meritocratic Institution

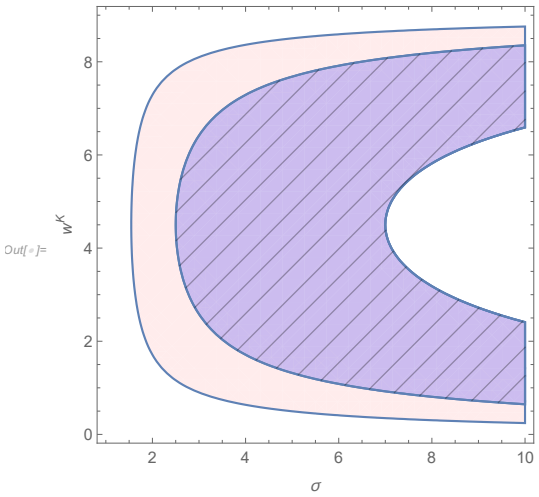


Figure 8: Stability Improvement Under Meritocratic Institution

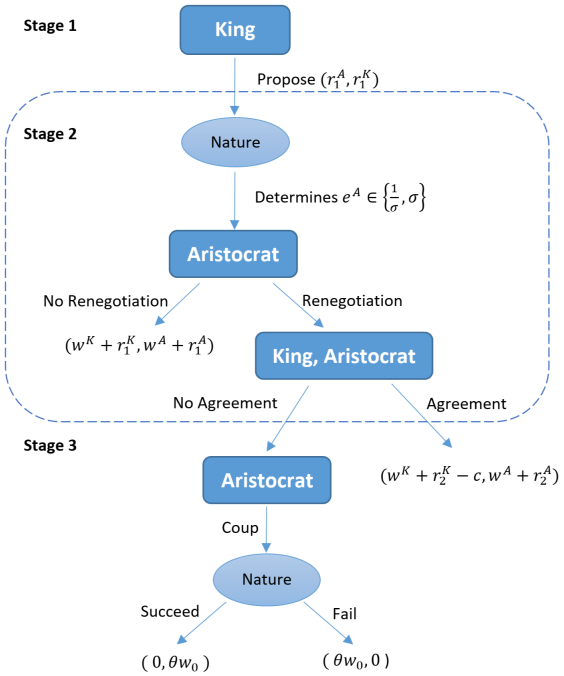
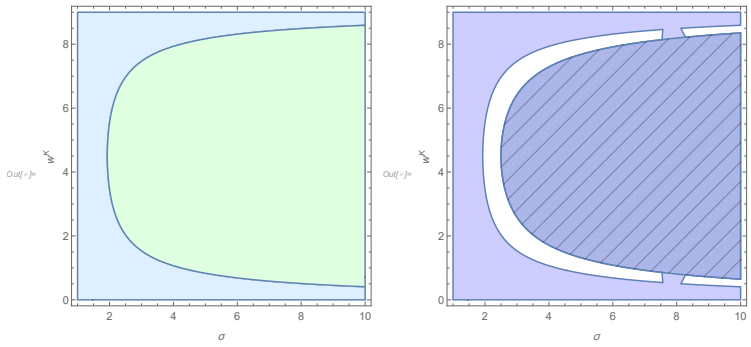
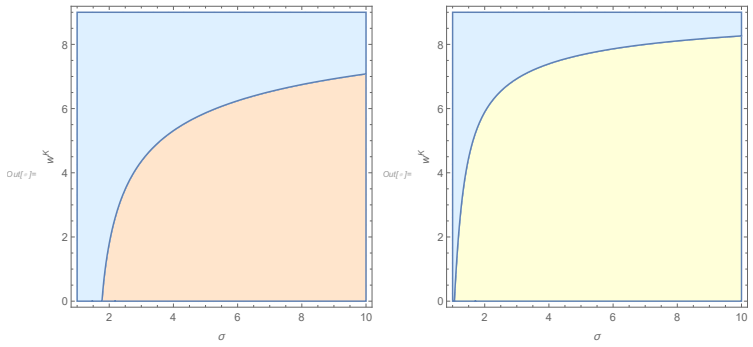


Figure 9: Timeline of the Game under Parliamentary Institution



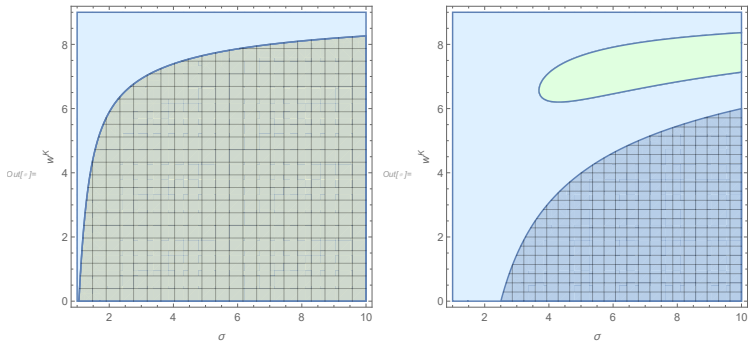
(a) The Equilibrium (b) Institutional Improvement

Figure 10: Equilibrium Under Parliamentary Institution



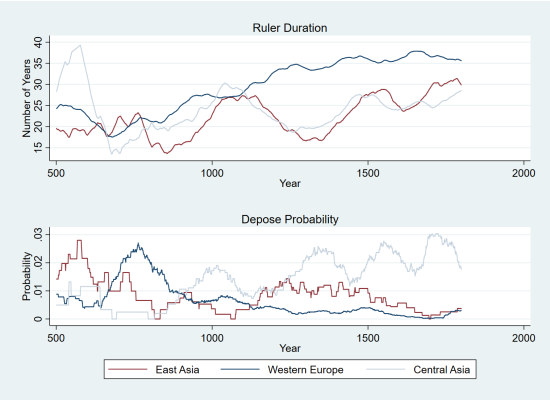
(a) No Institution (b) Meritocratic Institution

Figure 11: Equilibrium Under Meritocratic Institution



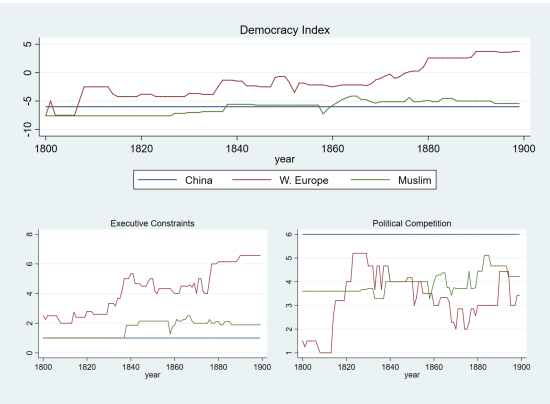
(a) Meritocratic Institution (b) Parliamentary Institution

Figure 12: political mobility Under Institutional Improvements



(a) Political Stability

Note: The picture shows the 100-year moving average of ruler duration and annual probability of ruler being deposed. The data on China is collected by the author based on Chronologies of Chinese Emperors and Their Families edited by Du (1995) and other supporting sources, while the data on other countries are based on Morby (1989).



(b) Institutional Comparison

Note: The data shown in the above picture comes from the Polity IV project.

Figure 13: Comparison of East Asia, Western Europe, and Muslim World

Table 1: The Impact of Institutions on Political Stability, Global Evidence

VARIABLES	(1) Ruler duration	(2) Ruler duration	(3) Depose Prob.	(4) Depose Prob.
Parliament meeting	4.000***	3.816**	-0.00542	0.00221
	(1.516)	(1.514)	(0.0404)	(0.0407)
CSE dummy	4.854***		-0.362***	
	(1.634)		(0.0706)	
CSE scale		0.0479**		-0.000309
		(0.0201)		(0.000564)
Regional dummy: compare to East Asia				
West Europe	4.310*	1.230	-0.499***	-0.291***
	(2.357)	(2.207)	(0.0609)	(0.0460)
Iberia	-5.594	-6.143	-0.0231	-0.00356
	(7.775)	(7.775)	(0.194)	(0.195)
Islamic	7.644**	3.686	-0.605***	-0.385***
	(3.867)	(3.654)	(0.113)	(0.105)
Constant	18.72***	20.11***	0.294***	0.295***
	(3.223)	(3.259)	(0.0742)	(0.0748)
Century & Country FE	Y	Y	Y	Y
Observations	3,126	3,126	1,891	1,891
R-squared	0.176	0.175	0.191	0.179

Note: the unit of analysis is ruler-reign. Robust standard errors in parentheses. *** indicates $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. The variable CSE Scale is the number of graduates who passed the Civil Service Examinations during the ruler's reigning period, and the variable Parliamentary is a dummy variable which equals to one if at least one parliamentary meeting was held during the ruler's reign. The data on Western Europe and Islamic countries comes from Blaydes and Chaney (2013). The data on ruler duration of East Asian countries comes from Morby (1989). The data on the number of CSE graduates comes from three sources: The Complete History of the Civil Service Examination System in China (2015), Sama Pangmok (1993), and Dai Viet Lich Trieu Dang Khoa Luc (1963).