The Prince – or better no prince?
The Strategic Value of Appointing a Successor*

Kai A. Konrad\textsuperscript{1} and Vai-Lam Mui\textsuperscript{2}

Abstract: Appointing a successor (the “prince”) allows the ruler (the “king”) to alter the structures of conflicts that take place between him and his potential challengers, as well as the structures of conflicts that take place among his potential challengers. Motivated by historical examples and using an infinite horizon rulership competition game, we show that while an appointed prince constitutes a powerful and dangerous threat to the incumbent ruler (the elevated threat effect), the appointed prince can also offer the incumbent ruler increased protection against other potential challengers (the barrier effect). We determine conditions when the overall effect of appointing a successor benefits the incumbent ruler and enables him to acquire a larger share of the governance rent in equilibrium.

Keywords: Coup, ruler, governance rent, successorship regimes
JEL Classification Numbers: D72, D74

\textsuperscript{1}Max Planck Institute for Tax and Public Finance, Marstallplatz 1, D-80539 Munich, Germany. Phone: +49-24246-5251. Email: kai.konrad@tax.mpg.de
\textsuperscript{2}Department of Economics, Monash Business School, Monash University, Clayton Victoria 3800, Australia. Phone: +61-3-9905-2349. Email: Vai-Lam.Mui@Monash.edu

* We thank Gary Magee, Kunal Sengupta, and Tridib Sharma for helpful conversations, and participants of the 2014 Australasian Public Choice Conference for helpful comments. The usual caveat applies.

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1 Introduction

“The king is dead, long live the king!” In a number of countries this proclamation was used to announce the death of the incumbent king and the immediate successorship by a previously designated prince. It hints at an important dimension of a wide range of governance structures, whether they are kingdoms, dictatorships or other autocratic regimes, democratic regimes, or even companies in the business world. The immediate succession of rulership in many of these contexts is assigned to a designated successor: a ‘prince.’ This paper studies when it is beneficial for a self-interested incumbent to have a prince than not having a prince. We also study how the appointment of a prince affects the rent captured by the incumbent, the appointed prince, and potential challengers to the rulership.

Appointing a prince allows the incumbent (the ‘king’) to alter not only the structures of conflicts that take place between him and his potential challengers, but also the structures of conflicts that take place among his potential challengers. The later include those conflicts that only take place after the incumbent’s “death.” The incumbent cares about the structures of those conflicts that take place after his death, and this is true even for an incumbent who has no concern about his legacy but is only motivated to maximize the rent he can capture during his rulership. Even for a self-interested incumbent, the structures of future conflicts for succession among the elite after his death matter because such structures affect potential challengers’ incentives to revolt against him. Appointing a prince changes the potential challengers’ strategic calculus regarding revolting. This affects the rent that the incumbent has to give them to discourage them from revolting.

More specifically, appointing a prince has two main effects. First, the prince constitutes an additional hurdle for contenders who aim at taking over the power from the incumbent. Appointing a prince may stabilize the regime of the incumbent, as the existence of a prince makes it more difficult for a member of the elite to replace the incumbent. Second, the appointment of an heir apparent places the prince in an elevated position: a position which makes a coup easier for the prince than for one of the many contenders. In case the incumbent leader dies or is removed, the prince is the natural successor. Hence, a prince offers increased protection against the rest of

\[1\] For simplicity, we shall use male pronouns instead of the more precise expression ”he/she” to refer to the ruler.
the elite (the *barrier effect*), but the prince himself becomes a powerful and potentially dangerous contender (the *elevated threat effect*).

The difficulties for the incumbent leaders to defend their elevated position to avoid “political death”–or even physical death–is well illustrated in autocracies. Eisner (2011) analyzes a large database on major monarchies in Europe ranging from AD 600 to 1800. He finds 219 sure or likely regicides, which was about 15 percent of all deaths. In about 40 percent of these regicides one of the members of the group associated with the assassination became the king. Eisner points out that this regicide rate is higher than any historical estimates of homicide rates in Europe’s general population during this time period. This regicide rate is also higher than the homicide rate in Ciudad Juarez in Mexico, which is one of the most murderous cities in the contemporary world. Eisner concludes that European kingship prior to the Industrial Revolution was “amongst the most dangerous occupations in the world” (Eisner, 2011, p.564), and also speculates about a possible relationship between violent conflict and succession rules (Eisner 2011, p.572). Similarly, Svolik (2012, p. 4n.) considers a database of 316 authoritarian leaders governing some time during 1946 and 2008, and finds that 205 of these were removed by insiders by coups and other non-constitutional means.

Aspects of the incumbents’ violent struggle for power have been described in many important papers in economics (see, e.g., Stephan and Ursprung (1998), Azam (2002), Azam and Mesnard (2003), Mehlum and Moene (2004), Acemoglu et al. (2009), and Virág (2009)). The ‘king’ and his ‘dukes’ are not just rival enemies, however. Some collaboration between them is necessary for the provision of elementary governance tasks. A incumbent needs the support of his powerful subordinates against external threats, as well as in the protection of property rights, the provision of other essential public goods, and the smooth operation of the governance system that yields tax revenue and keeps the ruler in power. This suggests that support and collaboration between the incumbent and the elite yields a positive governance rent, and also creates a distributional conflict between the incumbent and his elite.²

²Machiavelli (1988, p.82) observed that “a prince who is not himself wise cannot be soundly advised, unless he happens to put himself in the hands of a man who is very able and controls everything. Then he could certainly be well advised, but he would not last long, because such a governor would soon deprive him of his state.” Egorov and Sonin (2011) study the trade-off between loyalty and competence of persons in key positions. Competence helps stabilizing the regime and defending it against external threats. But a more competent deputy is also a threat to the incumbent. We disregard external threats in the main part of the paper, but focus on the competition between rival members of the elite.
In compensation for their continued support, the incumbent may share the spoils of rulership with the elite. In their pioneering work on the mutual dependency between a ruler and the ‘selectorates’–the group of players who have the power to support or replace the incumbent–political scientists Bueno de Mesquita et al. (2002, 2003) argue that it is these returns on their support that makes the elite willing to lend their support, rather than trying to replace the incumbent. As Bueno de Mesquita et al. (2003) have emphasized, the simultaneous existence of collaboration and competition between the incumbent and the elite applies to both autocracy and democracy, to party leaders and their high-ranking party officers in democracy, and even to CEOs and their immediate subordinates.3

In both economics and political science, some scholars have recently emphasized that while the literature on autocratic performance and autocratic stability traditionally focuses on the threat of popular revolts, more attention needs to be devoted to the importance of violent conflicts between the incumbent leader and the elite in determining regime stability and performance.4 Despite the fact that succession arrangements who may wage a coup. Sekeris (2011) considers a ruler’s choice of supporters from a heterogeneous set of individuals, how the ruler can use this choice to enhance his own rent, and how this choice depends on the ruler’s strength. Francois et al. (2014) pursue related questions focusing on the role of the experience of subordinates, where higher experience may increase their ability to stage a coup. Che et al. (2014) study a model of leader accountability in which the leader’s own decision regarding whether to perform or to embezzle affects his ability to use the prize of eventual promotion to leadership to discourage his subordinates from embezzling.


4In economics, drawing from Bueno de Mesquita et al. (2003), Besley and Kudamatsu (2008) present empirical evidence that effective threats by powerful selectorates to remove ineffective leaders lead to stronger performance in autocratic regimes. Acemoglu et al. (2010) emphasize that the military can help the leader maintain power but can also pose a threat to his rule. In political science, besides the pioneering work by Bueno de Mesquita et al. (2002, 2003), Magaloni (2008) and Svolik (2009, 2012) recently study power sharing, and Svolik (2012) also emphasizes that a dictator, when deciding how much resources to give to the military, balances the need to use the military to suppress popular revolts and the need to reduce the threat of a military coup. A related emerging literature examines how intraelite conflict leads to democratic transition. For example, Lizzeri and Persico (2004) and Llavador and Oxoby (2005) articulate related but different mechanisms regarding how conflict of interest within the elite led to franchise extension. Using data regarding ancient Greek city states, Fleck and Hanssen (2013) show that intraelite conflict in Greek poleis led to the emergence of tyranny, and the tyrant’s rule, through growth-promoting policies, laid the foundation for transition
are critical in shaping the interaction between the incumbent leader and the elite as well as among the elite, to our knowledge, this paper is the first contribution that formally analyzes how the incumbent can strategically choose succession arrangements to maximize his life-time rents in a dynamic model of mutual collaboration and competition between the incumbent and the elite.

Our analysis will be cast in terms of interactions between the “king,” his “dukes” and the “prince.” The insights obtained from our analysis regarding how the incumbent balances the trade-off between the elevated threat effect and the barrier effect when making succession decisions, however, are also relevant for other settings characterized by simultaneous collaboration and competition between the incumbent and his powerful subordinates. These include, for example, interactions between party leaders and their high-ranking party officers in democracy, between CEOs and their immediate subordinates in firms, and between leaders and their subordinates in other organizations such as unions and possibly even criminal and terrorist organizations.\(^5\)

The fact that strategic considerations in conflicts surrounding succession are important in shaping societal and organizational governance has been recognized by scholars in many fields. The political scientist Herz (1952, p.30) refers to the “crown-prince problem”: To install a crown prince may come along with a transfer of authority, and a strong crown prince may challenge the king even prior to natural death or voluntary demise. Reflecting on succession arrangements in different societies, the anthropologist Goody (1966, p.2) argues that succession conflicts “may loom so large that some societies, both monarchies and party systems, refuse to name a successor lest he should be tempted to succeed too soon.” The economist Tullock (1987, p.151) argued that if a dictator formally appoints a successor, “this gives the successor both strong motives for assassinating him and reasonable security that he will get away with it.” In her study of successions in the Song dynasty in China, the historian Ebrey (2006, p.54) to democracy.

\(^5\)Leeson (2007, p.1050) observes that the internal governance of criminal organizations has received relative little attention in the literature on criminal organizations, and presents an analysis of the internal organization of pirates. His focus, however, is not on the question of succession. Gambetta (1993, p.283n13) observes that an appointed successor can pose a threat to the boss of a mafia and reports examples of succession warfares in mafia (p.282n10). Price (2012, p.19) argues that leaders of terrorist groups know that they “live and die by the sword,” and their concerns for possible coups against them make them reluctant to provide subordinates with the knowledge and skills to run their organization in their place. This makes succession problem particular severe in terrorist organizations.
observes that both emperors Taizong and Zhenzong were reluctant to name an heir, and argues that this reluctance reflected a deep understanding by these rulers that “the appointment of an heir apparent would change the political dynamics of their courts.” Students of corporate governance have also emphasized that the threat of challenges by insider senior executives against the CEOs—especially challenges by potential successors—is important in affecting the functioning of firms (Ocasio, 1994; Shen and Cannella, Jr., 2002). The economist Congleton (2011, p.62) suggests that founders of business organizations and political regimes often adopt organizational practices that make themselves irreplaceable, so as to avoid their removal. Such tactics imply that the exit or death of the founder often leads to crisis for the organization or the regime.

Using an infinite horizon rulership competition game, we analyze how appointing a prince changes the structure of rulership contests among possible contestants, and how this feeds back and determines the division of rents for the incumbent. In particular, we ask if the appointment of a prince increases the incumbent’s payoff. A prince is defined here as a designated successor in case of the incumbent’s death or removal from power. The existence of a designated successor changes the elite members’ incentives for a coup. The coup may become more attractive for the designated prince and less attractive for other members of the elite. In turn, this changes the equilibrium distribution of rents. Our key question is if and when the appointment of a prince is in the interest of the incumbent and stabilizes his regime. We show that under both the princeless regime and the regime with a prince, the total probabilities of success in a coup are proportional to the payments that are required to make such a coup unattractive. This implies that the incumbent’s rent in the regime with a prince is higher than in a comparable regime without a prince if the sum of the probabilities of success in a coup is smaller in the regime with a prince. Whether this condition holds depends on the institutional environment and technological conditions.

The literature on succession discussed above clearly recognizes that a successor can pose a threat to the incumbent, and there is also some recognition that appointing a successor can “change the dynamics” among the elite. To our knowledge, however, this paper is the first that articulates the barrier effect as an illustration of how appointing a successor can change the dynamics among the potential challengers to the incumbent. Our analysis also highlights the hitherto neglected insight that even a self-interested leader who does not care about his legacy per se has the incentive to use succession decisions to manipulate the structures of succession conflicts among the contenders for
the rulership, because the structures of conflicts after his death can still affect the rent that the incumbent can capture during his lifetime.

Our formal analysis focuses on the trade-off between the barrier effect and the elevated threat effect and how it affects the king’s rent in equilibrium. The rationale for appointing a prince may, of course, have many further dimensions. After presenting our analysis, we discuss how our model can be extended to deal with some other dimensions of the succession problem.

In Section 2, we use the experiences of imperial Rome to illustrate the role of successors. Section 3 analyzes and compares a governance structure with and without a prince. Section 4 discusses how an incumbent’s strategic choice of succession arrangement may differ from the one preferred by the elite or the citizen. Section 5 discusses several extensions. Section 6 concludes.

2 Imperial Rome

To motivate our analysis we briefly consider the rulership fights in the time period from Augustus to Titus in ancient imperial Rome.6 This episode was a smorgasbord to study the implications of designating a successor. It was a period that followed the end of the Roman republic and marked a regime change towards an autocratic regime. It also was a period of experimentation and variation that provides much anecdotal evidence. At the beginning of the period there were no strong traditions and norms regarding rulership or successorship. As described by Finer (1997, p.546), however, during this period, “dynastic sentiment was remarkably deep-rooted, and where an emperor had no sons the succession might pass to the one he had adopted. Military coups and civil wars generally occurred when an emperor who was killed had designated no one to succeed and avenge him.” Finer also makes clear that power transition was not an automatism. Overall there was an interplay between a possible successor’s legitimacy, the formal authority of the Senate, and the support by the military.

The time period shows emperors of very different personality. They also differed in their governance style. Some emperors designated successors, some did not. Some successors became strong and popular, sometimes too strong and popular for their

master’s taste. There was a considerable variety of princes, with very different fortunes. The period shows the designated successor as a person in a precarious and highly endangered position. Being too competent and powerful, he risked being removed and killed by the incumbent, and replaced by a weaker prince. But being too weak and innocuous was also dangerous for the prince. Strength was needed in the moment of actual transition of power, at the time when the incumbent stopped ruling.

Another aspect of this period that simplifies the picture was the absence of a real major threat from the outside. This is not to say that the whole period was peaceful. Fights and battles led to some border adjustments, or required some resources to cope with insurrections in provinces at the distant borders of the empire (see Christ 2009). But seemingly there was no big external threat of the order of magnitude of ‘Hannibal ante portas’ that could challenge the independence and very existence of the Roman empire from the outside. Such external threats might have changed the logic of internal governance, might have calmed down internal conflict and pacified rivals. An external threat needs strong military leaders and may provide important tasks for members of the supporting elite. Hence, it also might change the role of the supporting elite, including the designated prince.

The historian Winterling (2011), focusing on the regime of Tiberius’ successor, describes the incumbency fights during the regime of Tiberius who governed from AD 14 to AD 37. Tiberius himself followed emperor Octavianus Augustus, but only because he outlived a whole series of designated successors, such as Augustus’ nephew Marcellus, Augustus’ friend and army general Agrippa, and Augustus’ own grandsons and adopted sons Gaius and Lucius (see Christ 2009, p.179). The reign of Tiberius had a long sequence of designated candidates and their removal or premature death (see Winterling 2011, pp.19-51): The first ‘prince’ was Germanicus, who was a grandnephew of Augustus. Tiberius had adopted Germanicus who became a war hero and most popular among the population. But Germanicus suffered from a sudden death with 33 years of age. He enjoyed strong support by the population and might have been a potential danger for Tiberius. There is some uncertainty about the cause of his death, and he might have been poisoned. The next candidate for successorship, Tiberius’ son Drusus II was poisoned by his own wife, and the murder was initiated by the head of the Praetorians, the imperial guards. The next two in line were the older sons of Germanicus, Nero and Drusus III. As potential successors they were caressed by the aristocratic elite. This, in turn, turned out to be dangerous for them. Nero was the
next victim. He and his mother were arrested, he was declared “hostis”, enemy of Rome, and banned to a little island. He and his mother died not much later. Drusus III, next in line, was accused of conspiracy, arrested and incarcerated for the rest of his life.

The third son of Germanicus, the later emperor Gaius Caesar Germanicus Caligula, seemingly understood his difficult position early on. He calmly watched what happened to members of his family. He managed to hide his ability and ambitions for long enough. Then he entered into a conspiracy with the head of the Praetorian guards. This led to a successful takeover of power at a point when Tiberius was in bad health condition. The details of Tiberius’ death are opaque. Winterling (2011) reports about several possible versions: natural death, poisoning, suffocation and strangulation. He concludes (p.18) about the whole sequence of casualties: “This complete disappearance of the imperial family can hardly be judged in moral terms. It resulted from the political relevance of those familial relationships and the potential mortal danger menacing all the emperor’s kin.”

Tiberius’ successor Caligula governed along similar patterns. Christ (2009) attributes his ability to survive in the role as a potential successor of Tiberius to his weak health, his purposeful modesty and complete adaptation, such that he did not appear as a threat, neither to Tiberius nor to the chief of the Praetorians. When Tiberius died, he left behind two potential heirs: Caligula and Tiberius’ grandson Tiberius Gemellus. Caligula managed to take over, with the help of Macro, the head of the Praetorians. One of his early major headaches was Tiberius Gemellus, the official coheir and potential rival for power. He adopted him as his son. Thereby he avoided paying out the bequest which Tiberius wanted to leave for Gemellus. Later Caligula forced Gemellus into suicide. Caligula also replaced the head of the Praetorians Macro. Macro had helped Caligula into power, but Caligula seemingly preferred someone as head of the Praetorians whom Caligula himself had bestowed with power, rather than someone who had empowered Caligula. As emperor he did not designate a strong successor. His reign took only two years, was plastered with conspiracies and Caligula eventually became the victim of one of these conspiracies, leaving successorship uncertain at the point of his assassination.

Caligula was followed by Claudius who was Caligula’s uncle. Claudius was not involved in the conspiracy that led to Caligula’s death and was reportedly in danger to be killed himself, as he was a member of the imperial family. But then he was picked
as a successor by the Praetorians. He is described as a person who was strongly handicapped: ugly, of weak health, stuttering and frequently confused (Christ, p.215/216). He was poisoned on October 13, AD 54. According to rumors, this murder was initiated by Agrippina, the highly ambitious daughter of Germanicus, who thereby advanced her 17 year old son Nero into power (Christ, p.228). Nero quickly adapted to the patterns of governance. In the year 55 AD he poisoned Britannicus, Claudius’ son, who had been a natural successor but had been outmaneuvered already by Nero’s mother Agrippina. Nero then killed his mother, Agrippina, 59 AD and induced the deaths of his former advisors, Burrus and Seneca, then executed his own wife Octavia 62 AD. Christ (2009, pp.236n.) reports Nero eliminating further contestants who gained reputation and popularity as military leaders, using his power to eliminate a number of persons he considered as dangerous, but also defending himself against major conspiracies.

Nero died without a designated successor. His death led to a situation with uncertainty about his successor and considerable rivalry. Galba, senator and formerly commander in Upper Germany, and imperial governor of Spain (see Finer 1997, p.547), came to power first. He tried to stabilize his rulership by adopting Calpurnius Piso Licianus and designating this person as successor. Piso was a member of the elite, but young and not too influential. A strong prince with huge political cloud could have augmented Galba’s power base. A strong prince would have established a major entry barrier for Galba’s rivals, but would also embody a major threat to Galba. Piso did not engage in a conspiracy or a coup, but he was also not sufficiently influential as a barrier to stabilize the situation. According to Christ (2009, 246), his adoption and nomination as ‘prince’ might have sped up the coming end of Galba’s rulership. M. Salvius Otho, senator and formerly governor of Lusitania (see Finer 1997, 247) might have hoped to attain the position as successor for himself. He formed an alliance with the Praetorians strong enough to overcome both Galba and his designated successor. Both Galba and Piso were killed 69 AD. Otho’s own rulership did not last for long, as he committed suicide on April 14, 69. He was succeeded by Vitellius, senator, consul and commander in Lower Germany (see Finer 1997, p.547) who, in turn, was killed in December 20, 69, to be followed by Vespasian who, similarly, was a senator, consul, formerly was proconsul of Africa, governor of Judaea (see Finer 1997, p.547).

This episode of strong rivalry among military leaders was followed by princeps Vespasian. His stable rule lasted from 69 to 96 AD. A special characteristic of this period was the role of Titus, his son and designated successor. Titus was considered as
a person with all the necessary prerequisites: educational training, talent, charisma, and attractive physical appearance. In comparison to designated successors of Augustus or Tiberius, Vespasian delegated a major share of his power to Titus, probably together with a major share in the rents from rulership. It might have been the generous sharing of power which Vespasian arranged for, together with the support which Titus provided to his father’s rule that stabilized this regime.

For the purpose of our analysis, the regimes of Tiberius, Caligula, Claudius, Nero, Galba, Otho, Vitellius and Vespasian, their political survival or failure, and the killings of designated successors unveils a number of aspects. First, the incumbent prince has a dangerous life. He may aspire the death of the incumbent most. And he may be able to mobilize strong helpers for a coup. Tiberius’ life, and the takeover of power by Caligula illustrates these two aspects. The prince is a major threat for the king, and the king has an incentive to eliminate any strong prince who has too much support. A strong prince may, however, stabilize matters if the king can gain the prince’s support, as Vespasian seemingly did. Vespasian changed the relationship between the ruler and the successor, made the successor powerful early on, and shared power and the benefits of ruling with his successor. And this was a more stable situation. But even a weak prince has a problem. He is a barrier for all other members of the elite who may aspire to become the king. Their only way to reach their goal is to remove the prince. One way to achieve this is to create the emperor’s mistrust and to destroy the imperial benevolence which the prince may enjoy. This is in line with the series of princes who have been killed, incarcerated or otherwise removed.

The first decades of the imperial Roman empire were full of idiosyncrasies. The particular characters and abilities of emperors matter. Accordingly, this episode is not an empirical test. But the evidence is suggestive for some of the trade-offs which we will unveil in the theory to be developed next.

3 The formal structure

We consider an infinitely repeated rulership game. There is a large set $K$ of players. At the beginning of each period $t$ there are 3 active players: one king and two dukes or one king, one duke and one prince. Whether or not there is a prince distinguishes two regimes which we analyze first separately and compare the outcomes subsequently. Players are infinitely lived. All players are identical in their preferences along all
dimensions, but in each period only 3 players are assigned to roles in which they can make active choices. All other players are inactive. Some of the inactive players have been dukes, kings, or princes, or a combination of these roles in previous periods, and will never be active in the future. As will become clear, one or more players in a given period may suffer a permanent loss of their status of active players and exit for the rest of the time horizon. All further inactive players are in the ‘replacement set’. Players who are inactive in a given period cannot make any decision and receive a period payoff of zero in this period. If, in the ongoing period, a duke or the king or a prince are forced to exit, the replacement set is used to make random draws from this set to replace these players for the next period.

3.1 The princeless structure

Consider first a governance structure without a prince. One of the players is the incumbent ruler at the beginning of any given period \( t = 1, 2, \ldots \). We refer to this player as the incumbent in \( t \) and denote this player \( R_t \). Further, there are two dukes at the beginning of each current period, and the set of these is \( S_t \equiv \{ S_{1t}, S_{2t} \} \). Possible actions and their sequencing in each period \( t \) is as follows. First, the king offers identical and non-negative shares \( s_t \) in the total governance rent to each of the two dukes in the current period.\(^7\) We limit the share to \( s_t \in [0, \frac{1}{2}] \), as the king cannot pay more than the governance rent. Next, each duke decides whether to accept the share \( s_t \), or whether to challenge the king in the respective period. We denote the decision of duke \( S_{it} \) at period \( t \) by \( \eta_{it} \in \{0, 1\} \), where \( \eta_{it} = 0 \) indicates willingness to accept the offer \( s_t \), and \( \eta_{it} = 1 \) denotes the decision to challenge the king.

If all dukes are willing to accept their shares in the governance rent, the economy stays peaceful in the respective period, a governance rent of size 1 accrues and is distributed between the king and his dukes according to the announced shares. Hence, the king receives \( 1 - 2s_t \), and each duke receives \( s_t \) in this case. This then ends period \( t \) and period \( t + 1 \) starts, without any change in the identity of the king, or in the set of dukes.

\(^7\)It is possible to allow for a set of heterogeneous shares and to discuss a whole set of possible types of collective decision making inside the group of supporters. For instance, if the decision to challenge the ruler must be taken by majority voting, the ruler may choose to give only to a subset of supporters. However, this is a different line of research which we do not pursue here.
As an alternative to agreeing to $s_t$, each duke can challenge the king and revolt. If such an attempt occurs, it destroys the governance rent in the respective period. What can be distributed between the king and the dukes in the respective period is zero. If a duke revolts, this action leads to the end for the king with probability $f^N(1)$. In this case the king becomes inactive in all future periods and receives a zero payoff in all future periods. Also, the revolting duke replaces the king as the incumbent at the beginning of the next period. If the coup is unsuccessful, the revolting duke is dismissed. All non-revolting dukes remain in place, regardless of the outcome of the revolt.\(^8\) Should both dukes revolt, the king is removed with probability $f^N(2)$, and each duke captures the rulership with probability $f^N(2)/2$. The loser in this competition is removed. We assume that $f^N(2)/2 \leq f^N(1)$.

Returning to the general specification of the model players who are active in a given period may condition their actions on different own or others’ actions in the past, and also on the identity of players in the different roles at different times, and this may lead to a whole wealth of possible equilibrium interaction outcomes. For each period $t$, for the king when choosing $s_t$, the history of the game is $h^t = [(S_0, R_0, s_0, \eta_{10}, \eta_{20}), \ldots, (S_{t-1}, R_{t-1}, s_{t-1}, \eta_{1t-1}, \eta_{2t-1}), S_t, R_t]$, and for each duke the history is $(h^t, s_t)$. Further, we may denote the set of all possible histories $h^t$ as $H^t$. Given this set-up, a behavior strategy for a player for the role as king and for the role as duke are sequences of mappings $s_t(h^t) : H^t \rightarrow [0, \frac{1}{2}]$, that maps any given history into the choice of an offer $s_t$, and $\eta_t(h^t, s_t) : H^t \times [0, \frac{1}{2}] \rightarrow \{0, 1\}$ that maps any given history into a decision whether or not to accept the payment offer $s_t$.\(^9\) An incumbent king’s expected payoff in the current and all future periods is the sum of all discounted expected period payoffs, and it depends on his and the other players’ actions and on the possible random outcomes in coup-periods. Similarly, a duke’s expected payoff in the current and all

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\(^8\) We borrow this assumption from Konrad and Skaperdas (2007) in their ‘conclave regime’. The evidence from ancient imperial Rome as well as for ancient imperial China is that non-revolting dukes need not lose their elevated position in the course of a revolt. As we shall discuss in Section 5 below, the experience of the rule of the Chinese Communist Party was that the paramount leaders survived all political conflicts, and it was the prince (the designated successor) who perished.

\(^9\) This defines behavioral choices for players for situations which they will never enter; e.g., a player who is currently the king will never become a duke, and a king or a duke who has been removed from office will never be in the position to make these choices, and all players in the replacement set. However, it does not harm to specify behavioral strategies for these zero probability events and it avoids tedious notational distinctions.
future periods is also only a similar additive function of his current status as duke, and
of the king’s period choice \( s_t \), and so for all players.

We therefore analyze a game in which we constrain the local strategies of players
to be functions of players’ own current status (as incumbent ruler, or duke) and of
state variables in the current period other than the identity of other players. That is,
a player’s local strategy at a period \( t \) depends on the player’s role in this period. If
the player \( i \) is inactive in that period (member of the replacement set, or a replaced
king or duke), the choice set is empty and the period payoff is zero. If the player is
the incumbent king, his local strategy is a choice of \( s_i \in [0, \frac{1}{2}] \). If the player is an
incumbent duke, his local strategy at period \( t \) is a function \( \eta_d(s_i) : [0, \frac{1}{2}] \to \{0, 1\} \) of
his role as a duke and of the share offered in this period only. Note that this restriction
also includes a stationarity property: for instance, the local strategy of an incumbent
at period \( t \) is the same as the local strategy of this player at period \( t + k \) if this player
is also the incumbent ruler in period \( t + k \).

We show the following proposition:

**Proposition 1** The princeless regime has a peaceful Markov perfect equilibrium (MPE)
in stationary strategies with payments to each duke in each period of

\[
s_t = s^N \equiv \frac{\delta f^N(1)}{1 + 2 \delta f^N(1)} \tag{1}
\]

The king’s rent per period in this equilibrium is

\[
r^N = \frac{1}{1 + 2 \delta f^N(1)}. \tag{2}
\]

**Proof.** Consider the following candidate for a stationary Markov-perfect equilibrium:
at each period, the incumbent chooses \( s_t = s^N \) as in (1). Both dukes accept this offer.
For any offer higher than \( s_t = s^N \) both dukes also accept this offer. For offers smaller
than \( s_t = s^N \), both dukes reject the offer if

\[
\frac{f^N(2)}{2} \geq \delta f^N(1).
\]

One duke accepts the offer \( s_t = s^N \) and the other duke rejects this offer if

\[
\frac{f^N(2)}{2} < \delta f^N(1).
\]
To confirm optimality of \( s_t = s^N \) and the optimality of the dukes’ choices as a function of \( s_t \), we make use of the one-stage deviation principle.\(^{10} \) Assuming that all players choose actions according to the candidate equilibrium in all future periods \( t + 1, \ldots \), we consider payoffs that emerge for possible local deviations from equilibrium play in period \( t \).

First, we consider whether the candidate equilibrium describes the dukes’ mutual best responses regarding their choices \( \eta_{1t} \in \{0, 1\} \) and \( \eta_{2t} \in \{0, 1\} \) for given \( s_t \) in period \( t \). The combinations of the dukes’ local strategies \( \eta_{1t} \) and \( \eta_{2t} \) at period \( t \) have four possible payoff outcomes with payoffs for duke 1 and duke 2:

\[
\begin{array}{c|cc}
\eta_{1t} = 0 & \eta_{2t} = 0 \text{ (accept)} & \eta_{2t} = 1 \text{ (revolt)} \\
\text{(accept)} & s_t + \delta s^N \frac{1}{1-\delta}, & s_t + \delta s^N \frac{1}{1-\delta}, \\
\eta_{1t} = 1 & f^N(1)\delta \frac{(1-2s^N)}{1-\delta} & f^N(1)\delta \frac{(1-2s^N)}{1-\delta} \\
\text{(revolt)} & f^N(1)\delta \frac{(1-2s^N)}{1-\delta} & f^N(2)\delta \frac{(1-2s^N)}{1-\delta}
\end{array}
\]

In this matrix, for given \( s_t \) and candidate equilibrium play in all further periods,

\[
s_t + \delta \frac{s^N}{1-\delta}
\]

is the payoff of a duke if both dukes accept the offer. Furthermore,

\[
f^N(1)\delta \frac{(1-2s^N)}{1-\delta}
\]

is the expected payoff of a revolting duke if only this duke revolts. This value takes into consideration that the governance rent in the revolt period is zero and that the coup may fail and the duke has zero payoff in all periods \( t, t + 1, \ldots \) with probability \((1 - f^N(1))\). The value

\[
\delta \frac{s^N}{1-\delta}
\]

\(^{10}\) Using Theorem 4.2 in Fudenberg and Tirole (1991, p.110) the one-stage-deviation principle can be applied here if the game is continuous at infinity. For this condition we need to consider the present value of payoff differences that can result from strategies that differ only after period \( t \). We need to confirm that the supremum of these differences converges to 0 as \( t \to \infty \). By construction, any player’s period payoff cannot exceed 1 and cannot fall short of 0. Accordingly the present value of the supremum falls short of \( \delta^*/(1-\delta) \) and \( \lim_{t \to \infty} (\delta^*/(1-\delta)) = 0 \).
is a duke’s payoff if this duke does not revolt but the other duke revolts. It differs from (3) due to the fact that the other duke’s revolt ruins the governance rent in the ongoing period. Finally,
\[ \frac{f^N(2)}{2} \delta \frac{(1 - 2s^N)}{1 - \delta} \]  
(6)
is the expected payoff of a duke if both dukes revolt.

Comparison of (3) and (4) shows that a duke who expects that the other duke does not revolt is just indifferent between whether to attempt a coup or to peacefully accept the payment if \( s_t = s^N \) as in (1). A duke strictly prefers not to revolt if \( s_t > s^N \). This shows that \( \eta_{1t} = 0 \) and \( \eta_{2t} = 0 \), are mutually optimal replies for \( s_t \geq s^N \). Finally, turn to \( s_t < s^N \). The peaceful choices \((\eta_{1t}, \eta_{2t}) = (0, 0)\) are not mutually optimal replies for \( s_t < s^N \). To confirm this we observe that \( \eta_{1t} = 1 \) is an optimal reply to \( \eta_{1t} = 0 \) as the payoff in (3) exceeds (4) for \( s_t < s^N \). The choices \((\eta_{1t}, \eta_{2t}) = (1, 1)\) are mutually optimal replies if
\[ \frac{f^N(2)}{2} \delta \frac{(1 - 2s^N)}{1 - \delta} \geq \delta \frac{s^N}{1 - \delta}. \]  
(7)
Condition (7) can be written as
\[ \frac{f^N(2)}{2} \geq \delta f^N(1). \]  
(8)
This condition is fulfilled if the discount factor \( \delta \) is sufficiently small. If the reverse inequality holds in (7), then, for \( s_t < s^N \) both \((\eta_{1t}, \eta_{2t}) = (0, 1)\) and \((\eta_{1t}, \eta_{2t}) = (1, 0)\) are mutually optimal replies. This holds because, given \( \eta_{1t} = 1 \), duke 2 prefers not to revolt by our discussion of (7), and given \( \eta_{1t} = 0, \eta_{2t} = 1 \) is an optimal reply for \( s_t < s^N \), as has already been argued. Accordingly, for these mutually optimal replies, at least one of the dukes revolts if \( s_t < s^N \).

The next question is whether the king is willing to pay \( s^N \). Again, we apply the one-stage deviation principle. Taking candidate equilibrium play of dukes in the period subgame as just described, and equilibrium play of all active players in future periods into account, any \( s_t > s^N \), even though it will be accepted by the dukes, is dominated by \( s_t = s^N \). The alternative to \( s_t = s^N \) which has the highest period payoff among

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11This argument focuses on the case when \((\eta_{1t}, \eta_{2t}) = (0, 0)\) if the ruler offers a share \( s_t > s^N \). Note that for \( s_t > s^N \), both the peaceful choices \((\eta_{1t}, \eta_{2t}) = (0, 0)\) and the violent choices \((\eta_{1t}, \eta_{2t}) = (1, 1)\) constitute mutually optimal replies if \( \frac{f^N(2)}{2} \geq \delta f^N(1) \). However, even if the dukes play \((\eta_1, \eta_2) = (1, 1)\) when \( \frac{f^N(2)}{2} \geq \delta f^N(1) \), the ruler again cannot gain from deviating to offering a share \( s_t > s^N \). The
all alternatives other than \( s_t = s^N \) is \( s_t = 0 \). This choice will trigger the revolt by at least one duke. One, maybe both dukes will revolt and this reduces the period payoff to zero for all players. In addition, the king may not survive the coup. Accordingly, if both dukes revolt, the present value of expected payoff from \( s_t = 0 \) as a possible deviation from the candidate equilibrium is

\[
\delta (1 - f^N (2)) \frac{1 - 2s^N}{1 - \delta}.
\]  

(9)

If only one duke revolts, the payoff is

\[
\delta (1 - f^N (1)) \frac{1 - 2s^N}{1 - \delta}.
\]

For any \( s^N < (1/2) \) these values are smaller than \( (1 - 2s^N)/(1 - \delta) \) - the present value of rulership in the candidate equilibrium. Hence, there is no optimal individual deviation from the local strategy in the candidate equilibrium for both the king and for the dukes if \( 2s^N < 1 \). As

\[
2s^N = \frac{2\delta f^N (1)}{1 + 2\delta f^N (1)} < 1
\]

(10)

this condition holds.

The king’s rent is \( r^N = 1 - 2s^N \) in each period. Inserting the equilibrium value (10) and simplifying yields (2). This completes the proof.

Proposition 1 describes a peaceful MPE in stationary strategies for a regime without a prince. Among the peaceful MPEs in stationary strategies, the equilibrium described in Proposition 1 is the one with the smallest shares given to the dukes.\(^{12}\) Furthermore, note that \( r^N > s^N \): the king is always better off than each duke in the equilibrium.

\(^{12}\)Suppose a stationary peaceful MPE exists for which the share given to each duke is \( \hat{s} < s^N \). In this case the dukes’ payoff for \((\eta_{1t}, \eta_{2t}) = (0, 0)\) is

\[
\hat{s} + \delta \frac{\hat{s}}{1 - \delta} < s^N + \delta \frac{s^N}{1 - \delta}
\]

and, hence,

\[
\delta (1 - f^N (1)) \frac{1 - 2\hat{s}}{1 - \delta} > \hat{s} + \delta \frac{\hat{s}}{1 - \delta}
\]

This shows that at least one of the dukes had an incentive to revolt, and this contradicts the claim that the MPE with compensation shares \( \hat{s} \) is peaceful.
In this equilibrium, the king offers $s_t = s^N$ as in (1) and both dukes accept the offer. The proof of Proposition 1 shows that if the king offers a share $s_t < s^N$, then depending on whether the condition $f^{N(2)} \geq \delta f^{N(1)}$ holds, different outcomes can constitute mutual best responses for the dukes. Importantly, regardless of whether $f^{N(2)} \geq \delta f^{N(1)}$ or $f^{N(2)} < \delta f^{N(1)}$, when $s_t < s^N$, the choices that constitute mutual best responses by the dukes will always have at least one duke rebelling. Hence, the king can never gain from deviating to offer a share $s_t < s^N$. Such a deviation will lead to both a current and a future loss, as a revolt destroys the governance rent in the current period and leads to a zero payoff for the king, and it further exposes the king to the risk of losing his rulership. Any offer with $s_t > s^N$ will be accepted by the dukes, but such deviation is unprofitable for the king as it involves giving an unnecessarily high amount of rent to the dukes.\footnote{In the analysis of out-of-equilibrium behavior in one-stage deviations we focus on mutually optimal replies of dukes in pure strategies. We note that the set of local mutually optimal replies between dukes may be richer. For some parameter range it may include mixing between $\eta_1$ and $\eta_2$ for this out-of-equilibrium behavior. The pure-strategy choices receive additional support, however, if we allow for an endogenous sequentiality of choices $\eta_1$ and $\eta_2$ (as in Hamilton and Slutsky 1990), or if the opportunity to revolt emerges for each duke in each period, but at a different moment: the sequential choices emerging in this case lead to the same out-of-equilibrium behavior as the pure strategies we consider. Alternatively, suppose that if the king deviates to offer $s_t \neq s^N$, the two dukes will play a mixed strategy equilibrium when one exists when deciding whether to revolt when facing such an offer. It can be shown that in this case, the king will always get a lower expected utility with such deviating offers compared to offering $s_t = s^N$.}

The MPE in Proposition 1 has intuitively plausible properties. The rent allocation is determined by the dukes’ threats, i.e., by the success probabilities of rebelling. Discounting matters. The king’s period rent is positive and is smaller if the future is more important, i.e., for a higher $\delta$. The extreme case reveals the intuition. For $\delta = 0$ it is not worthwhile to revolt, even if $s_t$ is negligible, because this reduces payment in the current period to zero and, for $\delta = 0$, whatever could be gained in the future, is discounted to zero.

### 3.2 The regime with a prince

We now consider a governance structure that is identical to the baseline structure, except for the modification which is at the focus of our research: starting with an incumbent king and two dukes, the king can give one of the dukes a special and
recurrent role and appoints this duke as his designated successor, or, borrowing from the terminology used in monarchies, a ‘crown prince’ (hereafter simply ‘prince’). The existence of the prince changes the game in each period, as the prince is the natural successor for a king who is replaced. This framework gives the prince a pole position, should some misfortune happen to the king.

Compared to the case when he was a duke, the prince’s elevated status can make it easier for him to succeed in launching a coup against the king. Furthermore, when he succeeds he is in the position to get control of the king’s resources which may give him a strategic advantage when facing possible challenge by a duke. These effects make the prince a more dangerous adversary for the incumbent than a duke. We shall refer to this as the elevated threat effect when the king appoints a prince. At the same time, because the prince possesses a pole position, even if the duke who is not elevated as the prince succeeds in eliminating the king, the prince can become the king and will be armed with the king’s resources when engaging in conflict with the rebelling duke. This implies that a rebelling duke now needs to eliminate the king and the additional barrier of the prince-turned king. This barrier effect makes it more difficult for a duke to become a king, and reduces the duke’s threat. We are interested in comparing these two effects and in determining conditions under which one effect dominates the other.

More precisely, the set-up is as follows. The king determines the share $p_t$ in the governance rent that is awarded to the prince, and the share $s_t$ of the governance rent that is awarded to the duke. These shares are, again, firmly committed and paid in the concurrent period. If a coup is launched in the concurrent period, the coup destroys the governance rent of the ongoing period completely, regardless of who initiates the coup and whether it is successful or not. The governance rent is zero in this case and this also reduces the value of these shares to zero. The governance rent is positive and equal to 1 if no coup is launched within this period. Possible conflicts are between the king and the prince, the king and the duke, and the prince and the duke.

Timing and the rules of conflict are as follows. First, the king announces the shares $s_t$ and $p_t$. Then the prince must decide whether or not to revolt. If the prince accepts $p_t$, then the executive government in that period consists of a king and a prince. In this case, next, the duke has the option to challenge the king and the prince. Independent of its success or failure, the revolt destroys the governance rent in this period. A successful coup by the duke requires a removal of both the king and the prince. We assume that the duke’s revolt either removes both the king and the prince or none of
them. If the coup fails, the king and the prince stay in office, but remove the duke and replace it by a new one. If the coup succeeds, then the duke becomes the new king, and this king draws a new prince and a new duke from the replacement set. We denote the probability of a single revolting duke to succeed in this coup as $f_s$.

If the prince challenged the king, the prince wins against the king with some probability. If the prince is not successful, the prince will be removed and replaced by a new prince at the beginning of the next period; if the prince is successful, the prince replaces the king and the king is replaced for the current and all future periods. In any case an attack by the prince leads to a situation in which there is an incumbent king but no prince for the remainder of the period. This may seem an opportunity for the duke, as he has to overthrow only one person, rather than two, in order to get a chance to succeed as the incumbent king in the next period.

We denote $\pi_p$ the probability that a prince who challenges the king overcomes the incumbent. Should a prince who overcame the incumbent king be attacked by the duke, in analogy with the princeless regime we denote the probability that the duke overcomes the prince in this attack as $f^N(1)$. We define

$$f_p = \pi_p (1 - f^N(1)).$$

This is the probability by which a prince’s revolt is eventually successful and by which the prince becomes the new incumbent ruler in period $t + 1$ if he challenges the incumbent in period $t$, and, if this challenge is successful, is attacked by the duke in the same period $t$.

Returning to the general set-up we can state the following proposition

**Proposition 2** A regime with a prince has a peaceful Markov perfect equilibrium in stationary strategies with payments to the prince of

$$p_t = p = \frac{\delta f_p}{1 + \delta f_s + \delta f_p}, \quad (11)$$

and to the duke of

$$s_t = s = \frac{\delta f_s}{1 + \delta f_s + \delta f_p}, \quad (12)$$

in each period if $f^N(1) > f_s$. Moreover, the king’s per-period rent net of these payments in this equilibrium is

$$r = \frac{1}{1 + \delta f_p + \delta f_s}. \quad (13)$$
Proof. Consider the following candidate for a stationary Markov-perfect equilibrium: The king offers \((p_t, s_t) = (p, s)\) as in (11) and (12) in all periods. When \(p_t \geq p\) and \(s_t \geq s\), the prince accepts \(p_t\) and the duke accepts \(s_t\). When \(p_t < p\) or \(s_t < s\), both the prince and the duke will revolt.

We make use of the one-stage deviation principle again. Consider first the duke’s decision for given offers \(s_t\) and \(p_t\) if the prince did not launch a coup. For a given offer \(s_t\), the duke compares the payoff from launching a coup, which is

\[ f_s(1) \delta \frac{1 - p - s}{1 - \delta} \]

and the payoff from accepting the offer and enjoying peace in the respective period, which is

\[ s_t + \delta \frac{s}{1 - \delta} \]

The \(s_t = s\) that equalizes these present values is

\[ s = \frac{(1 - p) \delta f_s}{1 + \delta f_s} \]

(14)

Given the perspective of playing the peaceful candidate equilibrium in all future periods, if the prince did not revolt, for the duke it is optimal not to revolt if \(s_t \geq s\), and it is optimal for the duke to revolt if \(s_t < s\).

Turn next to the optimal choice of a duke if the prince revolted in a given period \(t\). There is no active prince in period \(t\) in this case. Either the prince was successful and replaced the king, or the prince was unsuccessful and is removed, but not replaced in the ongoing period. The probability that a duke is replacing the incumbent king (who then has no prince on his side) is \(f_N(1)\). Let

\[ f_N(1) > f_s(1), \]

which says that it is easier to overthrow a single incumbent king than to overthrow both an incumbent and a prince. Note that the governance rent in period \(t\) is zero due to the prince’s revolt, which makes the duke’s optimal choice independent of the share \(s_t\) in this period and makes revolting optimal. Formally, the duke will always revolt when the prince revolted because

\[ f_N(1) \delta \frac{1 - p - s}{1 - \delta} > f_s(1) \delta \frac{1 - p - s}{1 - \delta} = s + \delta \frac{s}{1 - \delta} > \delta \frac{s}{1 - \delta} \]

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We take this into consideration when we now return to the choice of the prince, as the duke’s revolt is what a prince expects to happen if he challenges the incumbent and is successful. The prince observes \((p_t, s_t)\) and needs to decide whether to revolt. The size of \(p_t\) obviously matters, but \(s_t\) is important for the prince, too. This \(s_t\) guides the behavior of the duke in case the prince did not revolt.

Consider first the case \(s_t \geq s\), for which the duke does not revolt if the prince did not revolt. In this case, if the prince revolts, his payoff is

\[
\delta f_p \frac{1 - p - s}{1 - \delta}.
\]

This anticipates that the revolt destroys the governance rent in period \(t\) and makes the duke revolt, for whatever \(s_t\) was promised. If the prince accepts \(p_t\), the duke will not revolt given that \(s_t \geq s\), and the prince has a payoff from accepting of

\[
p_t + \delta \frac{p}{1 - \delta}.
\]

Accordingly, the prince accepts if

\[
p_t \geq p = \delta f_p \frac{1 - s}{1 + \delta f_p},
\]

and revolts otherwise.

Inserting this \(p\) into (14) and solving for \(s\) yields

\[
s = \frac{\delta f_s}{1 + \delta f_s + \delta f_p} \quad \text{and} \quad p = \frac{\delta f_p}{1 + \delta f_s + \delta f_p}.
\]

We have shown that if \(p_t \geq p = \frac{\delta f_p}{1 + \delta f_s + \delta f_p} \), \(s_t \geq s = \frac{\delta f_s}{1 + \delta f_s + \delta f_p}\), both the prince and the duke will not revolt.

Now consider \(s_t < s\), the prince’s payoff from revolting is again (15). If the prince accepts \(p_t\), then the duke revolts. The payoff of the prince becomes

\[
\delta(1 - f_s) \frac{p}{1 - \delta}.
\]

Because \(s = \frac{\delta f_s}{1 + \delta f_s + \delta f_p}\) and \(p = \frac{\delta f_p}{1 + \delta f_s + \delta f_p}\), and \(1 > \delta(1 - f_s)\),

\[
\delta f_p \frac{1 - p - s}{1 - \delta} > \delta(1 - f_s) \frac{p}{1 - \delta}.
\]

For any offer with \(s_t < s\), the duke is paid too little and will revolt even if the prince does not. This in turn implies that the prince will prefer to revolt even if \(p_t \geq p\).
Summing up, the best responses of the prince and the duke are as follows: When $p_t \geq p$ and $s_t \geq s$, the prince accepts $p_t$ and the duke accepts $s_t$. When $p_t < p$ or $s_t < s$, both the prince and the duke will revolt.

Using the one-stage deviation principle, we now show that the king prefers payments of $s_t = s$ and $p_t = p$ in period $t$ to any other alternatives in period $t$. At a cost of $p + s$, the king can prevent both the prince and the duke from revolting by offering $p_t = p$ and $s_t = s$. Because only offers with $p_t \geq p$ and $s_t \geq s$ will be accepted by both the prince and the duke, any offer other than $(p, s)$ that will be accepted by both the prince and the duke must have a cost $s_t + p_t > p + s$ and are dominated by $(p, s)$. Furthermore, any offers with $p_t < p$ or $s_t < s$ trigger revolt and destroy the governance rent in the ongoing period and further exposes the king to the risk of being displaced, and are therefore dominated by $(p, s)$.

Finally we calculate the king’s rent as $r = 1 - s - p$, or

$$r = \frac{1}{1 + \delta f_s + \delta f_p}.$$ 

This completes the proof. ■

Among all peaceful MPEs in stationary strategies, the MPE in this proposition is the one with the highest payoff for the king. A proof that there is no other peaceful MPE in stationary strategies that yields a higher $r$ than the MPE in Proposition 1 follows lines similar to the ones in footnote 12. Such an MPE would have to be peaceful and would require either a lower $s$ or a lower $p$. Together with a higher $r$, this is incompatible with both the prince and the duke prefer to abstain from revolting.

The equilibrium in Proposition 2 also has intuitive properties. Rents in the equilibrium are determined by success probabilities of revolt. The probability by which the prince or a duke is successful in a coup if they initiate a coup determines the size of the king’s rent. The higher this probability, the more attractive is a coup for the respective type of player, and the higher the compensation that is required to prevent the respective type from initiating a coup, which, in turn, reduces the king’s rent. Further, $r > s$ and $r > p$. The prince is better off than the duke if $f_p > f_s$. The comparative static results are also intuitively plausible. The king’s period rent $r$ is smaller if the prince or the duke impose a higher threat, and if the future is less strongly discounted.
3.3 Comparing regimes

We can now compare the king’s rents in the two regimes for the peaceful Markov perfect equilibrium that is characterized in Propositions 1 and 2. We find

**Proposition 3** For the comparison of the king’s rents it holds that \( r > r^N \) if \( f_p + f_s < 2f^N(1) \).

**Proof.** The result follows directly from comparing (2) to (13).

Using a dynamic model, we show that under both the princeless regime and the regime with a prince, the total probabilities of success in a coup are proportional to the amounts of payments that are required to make a coup unattractive. This translates into the condition in Proposition 3: the king’s rent in the regime with a prince is higher than in a comparable regime without a prince if the sum of revolt success probabilities of potential challengers to the king is smaller in the regime with a prince. This condition can be re-written as \( f_p - f^N(1) < f^N(1) - f_s \). If the prince has a higher revolt success probability than a duke under a princeless regime, then the leader will appoint a prince only if appointing a prince leads to a significant enough offsetting decrease in the revolt success probability of the duke who is not appointed as the prince.

4 Rent-maximizing versus conflict-minimizing succession arrangements

Our analysis so far focuses on when an incumbent who is only concerned about maximizing his life-time rent will find it in his own interest to appoint a successor. The fact that conflicts among the contenders for successorship that occurred after his political or physical death impose significant costs on both the citizens and the elite is of no concern to such a purely self-interested incumbent. On the other hand, the threat of conflicts that occurred after the incumbent’s departure can affect potential challengers’ incentives to revolt against the incumbent, and our analysis shows how the incumbent can strategically manipulate the structures of such conflicts to his advantage when making succession decisions.\(^{14}\) A strategic, rent-maximizing incumbent may

\(^{14}\) Konrad and Skaperdas (2007) illustrate in a formal model that the threat of violent conflict among the set of the possible would-be rulers may be beneficial for the incumbent ruler. The threat of violent
prefer high rivalry between potential successors to promote his own political survival, even if his preferred succession arrangement—including not appointing a successor—can lead to much succession conflict after his own death and leads to instability and collapse of the regime itself. In short, the succession arrangement chosen by a strategic rent-maximizing incumbent ruler may often not be conflict-minimizing.

In contrast, the existing literature on succession emphasizes how succession arrangements may reduce the conflicts among contenders after the incumbent’s departure, often (implicitly) emphasizing how avoiding such conflicts is beneficial to the elite, the citizens, and an incumbent who has concerns about his legacy. For example, Tullock (1987, p.162) argued that while hereditary succession does not always guarantee a peaceful transition from father to son, it “seems to be more peaceful than other methods.” Political scientists acknowledged that power transition may create a wasteful struggle for power (see Kokkonen and Sundell (2014), for a survey of this literature). The insecurity in the period of power transition is seen as a problem to be avoided (Herz, 1952). Kurrild-Klitgaard (2000) suggests that an automatic and unambiguous succession rule may be a possible solution to this problem. Using a dataset covering 961 monarchs ruling 42 European states between 1000 and 1800, Kokkonen and Sundell (2014) find that fewer monarchs were deposed in states practicing primogeniture than in states practicing alternative succession rules.

These observations suggest that the elite and the citizens face a political agency problem in the choice of succession arrangements. Suppose we relax the assumption that the incumbent only cares about his own life-time rent, and allow for the possibilities that he may care about his legacy, has concerns about the survival of the regime beyond his own political survival, or has altruistic concerns for his designated successor (though still mindful about the threat posed by the successor). Even for an incumbent with concerns beyond his narrow self-interest, from the perspectives of the elite and the citizens, the incumbent will always be putting excessive weights on his own political survival and rent maximization while putting insufficient weights on how succession conflicts may impose costs on others.

Our current analysis is cast in the context of a self-interested incumbent deciding
whether to appoint a successor when there is no socially-instituted rules governing succession, but it also sheds lights on when the incumbent may want to deviate from existing norms or institutional arrangements governing succession. The evolution of succession rules in many societies and organizations can be thought as driven to some extent by attempts of the elite—and to a lesser extent the citizens, through their threat of popular revolt—to impose constraints on the rulers and force them to internalize some of the costs borne by the citizens and the elite when succession conflicts occurred.

Our analysis suggests that if the formal appointment of a specific successor according to the existing succession rule increases the total probabilities of success in a coup compared to the alternatives of delaying the formal appointment or appointing an alternative successor, then the incumbent may prefer to deviate from the established rules of succession. This can occur if the appointment of the successor designated by the existing rules does not generate a significant barrier effect, or if this successor poses too much of a threat to the incumbent. In her study of successions in the Song dynasty in China, Ebrey (2006, p.54) points out that Taizong—who succeeded his elder brother and founder of the dynasty Taizu when the latter died in somewhat suspicious circumstances—did not follow the established norm of appointing his eldest son as his successor. Furthermore, he was reluctant to appoint an heir at all, and when he finally appointed his third son as his heir, he was uneasy that the people were pleased with this appointment.

Future research can study more carefully this political agency problem in the choice of succession arrangements faced by the elite and the citizens under different environments to understand when socially-instituted rules are effective and when they fail in binding the behavior of the incumbent. For example, the literature on political transition emphasizes how splits among the elite (Przeworski, 1991) and succession crises (Geddes, 1999) open up windows of opportunity for democratic transition in autocracy. A careful study of the political agency problem in succession may generate useful insights and policy implications regarding how divergent interests and strategic interactions among the incumbent, the elite, and the citizens facilitate or prevent the emergence of such windows of opportunity for democratic transition.

5 Extensions

In this section we consider some extensions and discuss directions for future research.
Natural death  We assumed that an incumbent ruler lives forever. This made the
analysis of Markov perfect equilibrium in stationary strategies tractable. It is possible
to generalize the analysis by introducing a stationary decay process. If all players are
affected by this decay process and may die, this generates many possible states in each
period: all players die, the two dukes die, one duke and one king dies, one duke dies,
the king dies, or none of the active players dies. This large state space makes the
analysis cumbersome. We may however simplify the question, assuming that only the
king can die a natural death in every period, with probability \((1 - \lambda)\), and that death
occurs once the king made payment offers \(s_t\) or \((s_t, p_t)\), respectively, but before the
other players can react to these offers.\(^{15}\)

If the king does not die, the game continues in this period as in Section 3. If the
king dies, in the regime without a prince the two dukes compete. One becomes king
with probability \(1/2\). The other duke perishes. The fight destroys the governance rent
in this period. New dukes are drawn from the replacement set. This ends the period \(t\).
In the regime with a prince, if the king dies, the former prince becomes the new king.
The duke can compete against the prince who became king. The duke has a probability
of \(f^N(1)\) to defeat the new king (given that there is no new prince yet appointed). The
fight destroys the governance rent. All vacant positions are refilled by new draws from
the replacement set. At the beginning of period \(t + 1\) the whole set of players that
constitute the elite is established. The following generalized proposition holds:

**Proposition 4** If the incumbent king dies a natural death with a small probability
\(1 - \lambda \geq 0\) after making payment offers, then the condition that ensures that the king’s
rent is higher under the regime with a prince than in the princeless regime is given by
the same condition as in Proposition 3: \(2f^N(1) > f_p + f_s\).

The proof of this proposition is in the Appendix. Note that the proposition focuses
on the comparison of the conditions that just prevent dukes and the prince from revolt
and how the natural decay changes these arbitrage conditions. It does not present a
generalized proof for the existence results established in Proposition 1 and Proposition
2 to this more general framework.

\(^{15}\)The decay of single players need not follow a stationary probability model. Rather, there may be a
natural lifetime pattern for individuals, making a death less likely when young, but increasingly likely
when old. This complicates matters as the stationarity property of the framework ceases to exist.

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The invariance of the condition in the proposition has a natural interpretation. The possible natural death of a king in each given period reduces the present value of being king. It makes an attack less attractive, and this increases what the king can keep in equilibrium. Natural death also makes it likely that rivals such as dukes or princes eventually become kings even without a coup. This also reduces what the king needs to give to the dukes, or to the duke and the prince, in order to prevent them from a coup. But it reduces these amounts in proportion to the probability for a natural death. Accordingly, the life as the prince or a duke becomes slightly less attractive in all regimes, but it does not change the relative advantage of one regime versus the other for the king.

**Attacking only the prince** So far we assumed that a duke or the prince may revolt or abstain from revolting against the king. However, the prince may as well become the only target of the attack. The duke may try to replace the prince if this can bring him to the pole position. Particularly if the king may die naturally, this may be important, but even otherwise this may be useful for the duke if the payment to the prince is higher than the payment to the duke. Also the king may remove the prince. In our framework this may happen if the prince is too strong. Consider the king’s period rent in the regime with a prince:

\[
    r = \frac{1}{1 + \delta f_p + \delta f_s}. \tag{16}
\]

It shows that it is expensive to prevent a strong prince with a high \( f_p \) from revolting. Of course, heterogeneity among princes about their \( f_p \) and the option to replace a prince would change the nature of the game and it is not possible to make clear-cut predictions based on our constrained framework. Intuitively, we would expect that it may be less expensive to replace a strong prince at some cost. If a new prince has a strength that is drawn from some random distribution, or if a weaker prince can be drawn, and if the king has a means or choice whether to replace a prince, then there should be a cut-off level of \( f_p \) such that a king replaces the prince whenever \( f_p \) becomes sufficiently high.

**Changes and asymmetries in strength** The analysis suggests that the power of the prince and/or dukes and the likelihood of success of a coup are important for the office rent of the king. In the equilibrium analysis in the main part of the paper we assumed symmetry, complete information and time invariance of the main parameters.
Going back to the historical accounts, none of these assumptions may hold strictly. There were strong and weak princes, and their appearance and their ability to hide their true strength matter. A king who finds out that a prince is very strong may either increase the payment to the prince or may use his power to replace the prince. These further elements also may explain why regicide, revolt and other types of violence within the ruling elite are observed. However, these issues would have to be investigated in future research.

The experience of the rule of the Chinese Communist Party (CCP) under Mao and Deng was that the prince (the designated successor) perished. Mao purged his deputy Liu Shaoqi and designated Lin Biao as his official successor. Lin was later accused of plotting an assassination against Mao and died while fleeing China. Commenting on these purges, Sandschneider (1985) observes that under the rule of the CCP, a person who succeeds in establishing a claim to succession “immediately and almost inevitably enters a state of vulnerability that is characteristic of his position” (Sandschneider 1985, p.650). Deng removed his designated successor—the then general secretary of the CCP Hu Yaobang— in 1987, and replaced him with Zhao Ziyang. Zhao was in turn purged in 1989. Perhaps reflecting a keen awareness of the danger of being the designated successor, Zhao displayed reluctance in accepting his new role, and said in an American television interview about a month before being publicly appointed to the job that “I’m not that fit to be the general secretary” (Yardley, 2005).

In these examples, the successor perished either because he was attacked by another contender and he was not backed by the leader, or he was essentially attacked by the leader. This latter option is also exercised in the period of imperial Rome, as illustrated by the long sequence of designated successors that have been removed, expelled or killed by the emperor or on behalf of the emperor.

**Bystander dukes** In order to focus on the barrier and elevated effects of appointing a prince, we removed a number of other aspects from the picture. We assume that a failed coup leads to a replacement of the revolting duke, but it allows all other dukes to be bystanders and to continue in their position. Alternatively, dukes may be forced to take sides, and may be replaced in case of a failed coup or in case of a change in government, depending on the side they chose. Intuitively, what speaks in favor of this assumption is the uncertainty which a king may feel about who was involved in a failed coup and a general mistrust, which may make it in the interest of the king to remove
all dukes.

Both the need to make the dukes take sides and the elements of uncertainty or loyalty considerations are absent in our formal model. As discussed, historical examples suggest that a large share of the dukes may survive a coup. The experience of the rule of the Chinese Communist Party was that the paramount leader survived all political conflict. Similar evidence exists for coups in imperial Rome. If the share of the elite that was involved in a coup was large and the boundaries of the set were uncertain, it was not viable for the king who survived the coup to prosecute or eliminate the whole elite.

**Probabilistic and more sophisticated appointment choices**  In our formal framework the leader makes a zero-one choice regarding whether to elevate one of the dukes to be the prince. A more refined treatment can have the incumbent decides how much to elevate the duke. That is, the incumbent chooses how much “power” to give to the prince, which determines how “easy” it will be for the prince to take over the leadership should the incumbent perish either because he is killed by the prince or a duke. The equilibrium level of elevation should be such that the marginal cost of the increased elevated threat equals the marginal benefit of the increased barrier effect.

This observation is of course tautological as it is, but it opens up avenues for richer analysis of the interactions between the incumbent and potential challengers. Our analysis suggests that the incumbent finds it attractive to appoint a prince who has a low ability to challenge the incumbent, but one who is very capable defending himself. Power struggles between the prince and the incumbent can be thought as the result of both the incumbent and the prince, in particular the incumbent, responding to shocks in the system and attempts to re-adjust the equilibrium level of elevation offered to the prince. As a prince’s ability to attack the incumbent or to defend himself are subject to changes over time, such considerations may provide novel insights regarding why so much violence occurred in the historical examples in imperial Rome, and why the prince was so frequently the victim in struggles for power, such as in imperial Rome and under the rule of the Chinese Communist Party.

Several other dimensions may enter into the picture. A duke may care about the specific characteristics and the identity of the prince: he may prefer one prince to another on the basis of the respective person’s competence, personal or family relationships with particular persons and other aspects. Succession may create another
barrier effect: the incumbent can appoint a successor that is so undesirable for the potential challengers—a person who every duke believes will be a terrible tyrant for them, or a truly mean or incompetent deputy dean—such that no one would like to challenge the incumbent because they are afraid that this bad prince can take over. It will be interesting to extend our framework to explore how incorporating these dimensions may help explain the considerable amount of violence in incumbency fights observed in many environments.

6 Concluding remarks

This analysis studies the strategic value of appointing a prince for the incumbent. We find that the appointment of a designated successor changes the elite members’ incentives for a coup. The coup may become more attractive for the prince and less attractive for other members of the elite. In turn, this changes the equilibrium distribution of rents. We studied how these two effects balance each other and identified conditions when the governance structure with a prince gives a higher rent to the king.

Our framework has its limitations. In particular, we made it a simple and uncoordinated choice for members of the elite whether to revolt. In our current analysis, we made it easy for players to trigger a coup. We assume that the coup has an uncertain outcome, but can be triggered by a single duke. In a more sophisticated environment in which a coup requires a conspiracy and joint action, the outcome of the coup may depend on the choices of the majority of the dukes. In fact a coup may require establishing a network or a group in a conspiracy. One of the consequences of this is that players care much more about which player launches a coup. And, as far as a successful coup or a failed coup have externalities to other dukes, it raises issues of coordination and collusion.

Evidently, there are a whole wealth of questions regarding how succession arrangements can affect the relationship between an incumbent and the elite who may support his regime or may stage a coup. Our formal analysis focuses on the single question regarding how appointing a successor affects the stability of a ruler’s regime and the allocation of governance rents, but the discussion in Section 5 illustrates how the framework can be extended to investigate a whole wealth of questions. We are hopeful that the framework can form the basis for further investigations concerning how the incumbent ruler’s strategic choices regarding succession arrangements alter the structure of
rulership competition and shape the evolution of governance structures.

7 Appendix

This appendix proves Proposition 4. Consider first the 2-dukes regime. The king offers $s_t$ and survives with probability $\lambda$. If the king dies, the dukes compete. Each duke’s probability for becoming the king in this fight is $1/2$. There is no governance rent in this period. If the king survives, one or both dukes may revolt or both take the payments $s_t$ offered to them, as in Section 3. The condition that makes a duke indifferent about whether to revolt if the king survives and the other duke does not revolt that replaces the characterization of the stationary Markov perfect equilibrium in Section 3 becomes

$$\frac{1}{1 - \lambda \delta} s^N + (1 - \lambda) \frac{\delta \lambda}{2(1 - \lambda \delta)} r^N \frac{1}{1 - \delta \lambda} = f^N(1)r^N \frac{\delta \lambda}{1 - \lambda \delta}. (17)$$

Here, $r^N = 1 - 2s^N$ is the king’s per-period equilibrium surplus if he stays alive in this period. If a single duke revolts, this gives the revolting duke a present value of his payoff on the right-hand side of (17). It differs from (4) by an increase in the discount factor to $\lambda \delta$. If none of the dukes revolts, this gives each duke a present value that consists of several terms. The first term is the present value of the rent as duke along the peaceful path for which the king survives forever and the dukes never revolt. But the king dies with probability $(1 - \lambda)$ in the given period. At this point one of the dukes becomes the king, the other duke loses the competition and disappears. Both outcomes occur with probability $1/2$. If the duke becomes the king, he receives the king’s surplus $r^N$ in each future period until he dies. He receives this surplus from the period $t + 1$ on, but only if he survives in period $t + 1$. This expected present value is $\frac{\delta \lambda}{1 - \lambda \delta}$, because the payoff stream starts only one period after the old king’s death, and it starts only if the new king does not die in period $t + 1$. As the king can die in every period, this possible rent can start in each of all future periods. Summing up all these yields the additional term $1/(1 - \delta \lambda)$.

Consider next the regime with a prince. The most natural assumption, corresponding with the assumption in the no-prince regime, is that the prince has the right to replace the king. The duke may revolt and is likely to do this: the duke would have to fight a king and a prince in future periods, and the future payments $s$ are low, as they account for these difficulties. In the current period, the duke needs to overcome only the newly crowned king but no prince. So the duke will revolt once the king dies. If
the king does not die, for the prince we have a payoff from revolt of

$$f_p \frac{\lambda \delta}{1 - \lambda \delta} r.$$ 

Again, $\lambda \delta$ replaces $\delta$, and $r = 1 - p - s$ is the king’s per-period equilibrium surplus if the king is alive in the respective period and in the absence of revolt. The prince’s payoff from not challenging the king consists of several components. The prince receives $p$ in the respective period, and, taking the king’s mortality into consideration, this contributes to his payoff a present value of $\frac{1}{1 - \delta \lambda} p$ from the random path along which the king survives. In addition, there is the present value of becoming the king as a natural successor. In a given period $t$, the king dies with probability $(1 - \lambda)$. In this case the prince is to succeed. However, the duke will take his chance. Whoever succeeds in this revolt becomes king. This king survives into the next period with probability $\lambda$, and we have to take into consideration discounting. Accordingly, the present value of the expected payoff from these instances is $(1 - \lambda) \frac{\lambda \delta}{1 - \lambda \delta} r (1 + \lambda \delta + ...)$, or

$$(1 - \lambda) \frac{\delta \lambda}{1 - \lambda \delta} \frac{1}{1 - \lambda \delta} r.$$ 

This takes into consideration that the return of being the new king starts flowing only one period after the period in which the old king died. This explains the factor $\delta \lambda$, where $\delta$ accounts for the one period delay and $\lambda$ for the fact that the newly crowned king may already die prior to receiving the first rewards as king in his first regular office period. So, in equilibrium the prince is just indifferent whether to challenge the king if:

$$\frac{1}{1 - \delta \lambda} p + (1 - \lambda)(1 - f_N(1)) \frac{\delta \lambda}{1 - \lambda \delta} \frac{1}{1 - \lambda \delta} r = f_p \frac{\lambda \delta}{1 - \lambda \delta} r.$$ 

(18)

Turning to the single duke, the indifference condition for not revolting is

$$\frac{1}{1 - \delta \lambda} s + (1 - \lambda) f_N(1) \frac{\delta \lambda}{1 - \lambda \delta} \frac{1}{1 - \lambda \delta} r = f_s \frac{\lambda \delta}{1 - \lambda \delta} r.$$ 

(19)

The right-hand side is the duke’s present value payoff from revolting in a regular period. The left-hand side is the present value from not revolting as long as the king survives into the next period, but revolting against the prince if the king died.

Now we use $r^N = (1 - 2s^N)$ to transform (17) into

$$\frac{2s^N}{1 - 2s^N} = 2f_N(1) \delta \lambda - (1 - \lambda) \frac{\delta \lambda}{1 - \lambda \delta}.$$ 

(20)
and we add up the respective sides of equations (18) and (19) and multiply by \((1 - \lambda \delta)\) to obtain

\[
(p + s) + (1 - \lambda)(1 - f^N(1)) \frac{\delta \lambda}{1 - \lambda \delta} r + (1 - \lambda)f^N(1) \frac{\delta \lambda}{1 - \lambda \delta} r = f_p \lambda \delta r + f_s \lambda \delta r.
\]

Sorting terms, making use of \(r = 1 - p - s\) and dividing by \((1 - p - s)\) yields

\[
\frac{p + s}{1 - p - s} = (f_p + f_s) \delta \lambda - (1 - \lambda) \frac{\delta \lambda}{1 - \lambda \delta}.
\]

The two equations (20) and (21) have a similar structure. It follows that \(2s^N > p + s\) if

\[
2f^N(1) > f_p + f_s.
\]

This is the same condition as in Proposition 3 for the king to prefer the regime with a prince.

References


[37] Shen, Wei, and Albert Cannella, Jr., 2002, Power dynamics within top management and their impacts on CEO dismissal followed by insider succession, Academy of Management Journal, 45(6), 1195-1206.


