Appendix

Figure A1: Sensitivity Analysis
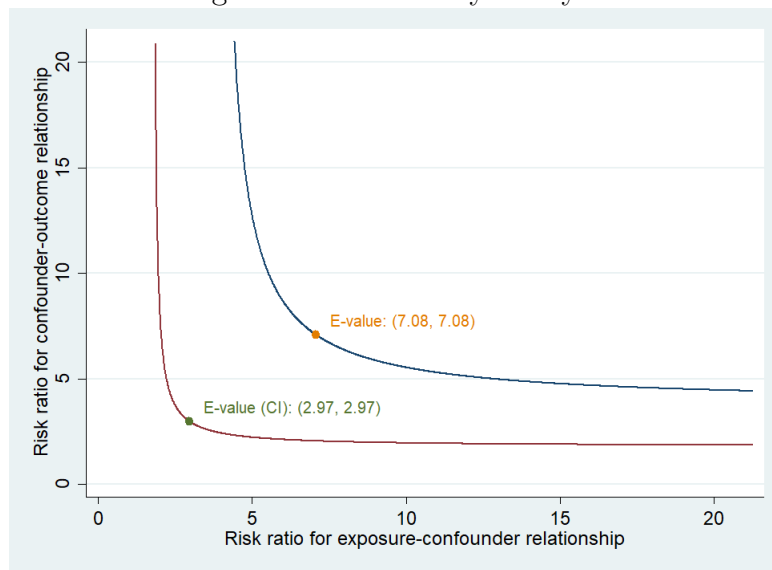

Figure A2: Robustness Checks for the Operationalization of VSNs
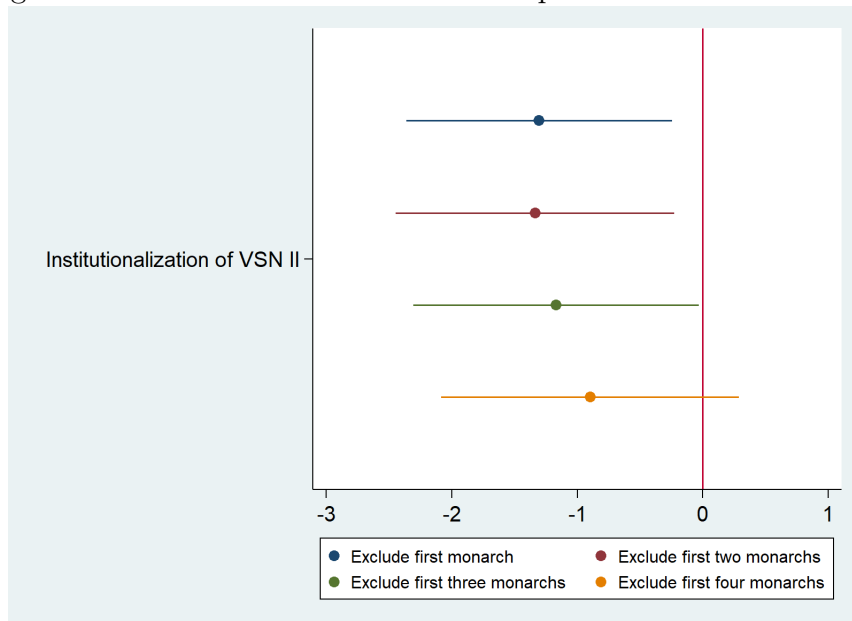
Table A1: Cox Models with Stratification

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Institutionalization I	-0.591^{+} (0.303)		-0.784^{*} (0.323)		-0.847^{*} (0.348)		-0.798^{*} (0.337)	
Institutionalization II		-0.943^{*} (0.376)		-1.158^{**} (0.397)		-1.215^{**} (0.418)		-1.207^{**} (0.418)
Length of ruling (t-1)			0.004 (0.009)	0.005 (0.009)	0.006 (0.010)	0.008 (0.010)	0.005 (0.010)	0.008 (0.010)
Exit mode (t-1)			0.250 (0.299)	0.183 (0.299)	0.265 (0.306)	0.245 (0.305)	0.273 (0.308)	0.246 (0.306)
External threat					0.005 (0.165)	0.154 (0.164)	0.035 (0.167)	0.167 (0.164)
Number of counties					0.313 (0.272)	0.173 (0.262)		
Number of titles							-0.279 (0.284)	-0.107 (0.285)
Observations	357	357	340	340	340	340	340	340

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A2: Cox Models with Stratification and Century Fixed Effects

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Institutionalization I	-2.054^{***} (0.575)		-2.113^{***} (0.584)		-2.018^{***} (0.596)		-1.981^{***} (0.592)	
Institutionalization II		-1.275^{**} (0.475)		-1.364^{**} (0.494)		-1.311^{*} (0.510)		-1.329^{**} (0.511)
Length of ruling (t-1)			-0.000 (0.010)	0.005 (0.010)	0.001 (0.010)	0.006 (0.010)	0.001 (0.010)	0.006 (0.010)
Exit mode (t-1)			0.070 (0.311)	0.140 (0.307)	0.098 (0.314)	0.179 (0.310)	0.102 (0.315)	0.177 (0.310)
External threat					0.280 (0.353)	0.450 (0.353)	0.351 (0.336)	0.482 (0.326)
Number of counties					0.227 (0.301)	0.062 (0.294)		
Number of titles							-0.145 (0.291)	0.006 (0.299)
Century FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	357	357	340	340	340	340	340	340

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3: Cox Models with Stratification: Exclude Short-lived Monarchs

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Institutionalization I	−1.989** (0.656)		−2.108** (0.664)		−2.048** (0.687)		−1.979** (0.676)	
Institutionalization II		−1.079* (0.525)		−1.174* (0.546)		−1.072$^+$ (0.555)		−1.126* (0.558)
Son of predecessor								
Length of ruling (t-1)			−0.007 (0.011)	−0.000 (0.011)	−0.005 (0.011)	0.001 (0.011)	−0.006 (0.011)	0.000 (0.011)
Exit mode (t-1)			−0.197 (0.377)	−0.131 (0.369)	−0.174 (0.380)	−0.085 (0.372)	−0.162 (0.380)	−0.086 (0.372)
External threat					0.182 (0.385)	0.345 (0.384)	0.319 (0.363)	0.432 (0.350)
Number of counties					0.289 (0.311)	0.142 (0.303)		
Number of titles							−0.048 (0.389)	0.076 (0.395)
Century FE	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
Observations	330	330	313	313	313	313	313	313

Standard errors in parentheses
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A4: Cox Models: Include Son of Predecessor

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Institutionalization I	−0.638* (0.293)		−0.736* (0.294)		−0.720* (0.305)		−0.692* (0.297)	
Institutionalization II		−1.074*** (0.269)		−1.035*** (0.281)		−1.067*** (0.289)		−0.990*** (0.288)
Son of predecessor			−0.582* (0.296)	−0.322 (0.293)	−0.606* (0.300)	−0.317 (0.297)	−0.588* (0.298)	−0.349 (0.297)
Length of ruling (t-1)			0.006 (0.009)	0.005 (0.009)	0.008 (0.009)	0.007 (0.009)	0.008 (0.009)	0.006 (0.009)
Exit mode (t-1)			0.083 (0.331)	0.201 (0.322)	0.097 (0.331)	0.248 (0.320)	0.101 (0.331)	0.193 (0.324)
External threat					0.107 (0.145)	0.104 (0.134)	0.123 (0.142)	0.122 (0.135)
Number of counties					0.030 (0.170)	0.082 (0.135)		
Number of titles							−0.131 (0.168)	−0.049 (0.145)
Observations	357	357	340	340	340	340	340	340

Standard errors in parentheses
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A5: Cox Models with Stratification and Century Fixed Effects: Additional Measures of Primogeniture

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Institutionalization (four)	-1.305^{**} (0.465)		-1.423^{**} (0.485)		-1.322^{**} (0.493)		-1.331^{**} (0.494)	
Institutionalization (six)		-0.384 (0.721)		-0.528 (0.758)		-0.639 (0.821)		-0.640 (0.851)
Length of ruling (t-1)			0.008 (0.010)	0.003 (0.010)	0.008 (0.010)	0.004 (0.010)	0.008 (0.010)	0.004 (0.010)
Exit mode (t-1)			0.151 (0.308)	0.199 (0.307)	0.180 (0.310)	0.235 (0.310)	0.178 (0.310)	0.232 (0.311)
External threat					0.403 (0.358)	0.482 (0.355)	0.431 (0.329)	0.544^{+} (0.329)
Number of counties					0.062 (0.292)	0.155 (0.273)		
Number of titles							-0.023 (0.293)	-0.126 (0.284)
Century FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	357	357	340	340	340	340	340	340

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A6: Sub-distribution Hazard Models

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
Institutionalization of VSN I	-0.874 (0.532)		-0.793 (0.495)		-1.017^{*} (0.472)		-0.988^{*} (0.504)	
Institutionalization of VSN II		-1.021^{***} (0.278)		-0.985^{***} (0.292)		-0.884^{**} (0.303)		-0.833^{**} (0.289)
Length of ruling (t-1)			-0.001 (0.005)	0.002 (0.004)	-0.001 (0.005)	0.001 (0.004)	-0.001 (0.005)	0.001 (0.004)
Exit mode (t-1)			0.415 (0.285)	0.218 (0.274)	0.219 (0.272)	0.171 (0.265)	0.219 (0.275)	0.172 (0.269)
External threat					0.519^{*} (0.254)	0.235 (0.225)	0.525^{*} (0.250)	0.283 (0.217)
Number of counties					-0.003 (0.192)	0.086 (0.152)		
Number of titles							-0.053 (0.139)	-0.009 (0.138)
Century FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	352	352	335	335	335	335	335	335

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7: Comparing Ancient China with Medieval and Early Modern Europe

	(1) Full sample	(2) Partial sample	(3) Full sample	(4) Partial sample
Informal rule	0.128	−0.125	0.199	−0.139
	(0.284)	(0.399)	(0.261)	(0.368)
Exit mode (t-1)			0.643**	0.734**
			(0.202)	(0.248)
Observations	782	558	738	528

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A8: Vertical Successions in the Modern World

	Full sample	Exclude monarchies
Monarchy	0.287	
	(0.261)	
Military	0.872***	0.881***
	(0.189)	(0.190)
Personal	0.896***	0.902***
	(0.181)	(0.181)
Vertical Successions	-1.981*	-1.254
	(1.008)	(1.008)
Observations	611	556

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Terminologies

"Ancient China": I use the word "ancient China" to refer to "an era within the geographical confines of modern China that was the cradle of Chinese culture and civilization (Zhao, 2015, p. 51)."

"Primogeniture": the concept of primogeniture was created to depict European phenomena, and it imposes inaccuracies when applied to the Chinese context. I should clarify that in the Chinese context, a monarch can have multiple concubines but he can only have one legal wife, and primogeniture specifies that succession right goes to the eldest son of the monarch's legal wife. I use the same term to depict similar succession rules across cultures because it facilitates comparison.

"Feudal system": the concept of feudalism was created to depict European phenomena, and it imposes inaccuracies when applied to the Chinese context. I fully acknowledge that there is a debate on whether it is appropriate to use the term "feudalism" to describe the political and economic system of the Western Zhou.

Historical Cases of Informal Succession Rules

Throughout human history, succession rules were informal most of the time. Among Arabian dynasties, "no firm principle specified which member of the ruling family had the right to rule (Herb, 1999, p. 22)." The vast majority of dynasties in the Middle East had the same principle. For example, though primogeniture became the de facto succession order in the Ottoman Empire after 1617, it was not formalized legally (Alderson, 1956). Empires in Asia had the same pattern. The Mughal Empire in India had no formal succession rules. In Japan, there were no formal rules governing succession to the throne until the 1889 Meiji Constitution. Also, succession rules were never formalized in ancient and imperial China (Li, 1987). While most European states have witnessed the development of formal succession rules since 1500 CE, most polities did not have a clear succession rules for female heirs during the medieval period (Acharya & Lee, 2019).

Lineage Law in Ancient China

The core concepts of lineage law are Major Lineage (dazong) and Minor Lineage (xiaozong). The king of Zhou was the head of the Major Lineage for the whole kingdom and the eldest son of his legal wife was supposed to inherit the throne. The king's younger sons or sons of concubines became vassals or nobles who belonged to the Minor Lineage relatives to the king of Zhou. However, vassals were the head of the Major Lineage in their own territories and similarly, the eldest sons of their legal wives were supposed to succeed the lordship and younger sons or sons of concubines became nobles who belonged to the Minor Lineage relative to the vassals (Wu, 1984). Under lineage law, not only the state became a private entity of the royal family, but the political order was seen as dictated by lineage principles (Zhao, 2015).

Generations of the Aristocratic Lineages

Data on the aristocratic lineages are from He (1996, p. 202-203). In the book, the author lists all the names of the aristocratic lineages for 10 states during the Spring and Autumn Period. Aristocratic lineages are divided into three groups according to how long they lasted: those that lasted 3-4 generations, 5-8 generations, and 9 generations and above.

The data is missing for three states, Wu, Yue, and Yan, and therefore I exclude them from the analysis. However, I still need to make a reasonable assumption in order to extend the analysis to the Warring States Period. I assume that the aristocratic lineages that lasted 9 generations and above still existed in the Warring States Period, and I use that number to measure the level of elite competition for states during the Warring States Period. While this measure is very rough and imperfect, it is the best available measure we can get. The assumption is reasonable because a generation is about 30 years, and 9 generations equal to 270 years. Because the Spring and Autumn Period is less than 300 years, the aristocratic lineages that lasted 9 generations or above were very likely to exist in the Warring States Period. Also, the accumulation of economic and political power by the aristocratic lineages that lasted for hundreds of years would allow them to survive and play a role in policy making in the Warring States Period.

There were only 9 aristocratic lineages that lasted 9 generations and above, and they came from 5 states. As far as I know, they still played a role in politics during the Warring States Period. For example, the "Mengsun" lineage in the state of Lu remained very powerful in the Warring States Period.

One may worry that new aristocratic lineages may emerge during the Waring States Period. However, this is very unlikely. Most of the aristocratic lineages originated from the founding generations, and as states underwent bureaucratic reforms, it became more and more difficult for a new aristocratic lineage to emerge. Meanwhile, the existing aristocratic lineages would try to prevent the emerge of new aristocratic lineages.

This measure of elite competition matches history well. Jin, Lu, and Qi had the highest values of the total number of generations of the aristocratic lineages, and elite

competition in these states were most acute (Zhao, 2015, p. 147). Qin had one of the lowest values of this measure, and it unified China eventually. There is no evidence that this measure correlates with the size of a state, as small states such as Song and Wey also had large values for this measure of elite competition.

Formal vs Informal Vertical Successions

Data of European monarchs are from Kokkonen and Sundell (2014). To capture the idea of formal vertical successions, I restrict the European sample to states with de jure primogeniture laws, which results in 425 European monarchs in total.

Estimating the same Cox models with European monarchs as the baseline, I find no evidence that formal laws of vertical successions perform better than their informal counterparts. Results are reported in Table A6 in the Appendix. In model 1 which I include the full sample of monarchs in ancient China, the coefficient of "China" is positive but statistically not distinguishable from zero, which suggests that monarchs in ancient China (where vertical succession was informal) were not more likely to be removed by the domestic elite compared to monarchs in medieval and early modern European states with formal laws of vertical succession. And in model 2 where I restrict the Chinese sample to monarchs in states with institutionalized VSN, the coefficient of "China" becomes negative but still statistically insignificant. The results remain the same if we control for the previous monarch's exit mode.[1]

Admittedly, while ancient China and medieval and early modern Europe share some similarities, they differ in many ways. And variables not included in the regressions such as religion and technology can potentially drive the results. However, the results here provide some confidence that both formal and informal succession institutions can facilitate peaceful power transition in monarchies.

Regime Types, Leaders' Tenure, and Vertical Successions in the Modern World

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[1]Because other control variables such as state capacity are measured differently in Kokkonen and Sundell (2014), they are not appropriate to be included in the regressions.

To gather a global sample of authoritarian regimes in the modern world, I use the dataset of Geddes, Wright, and Frantz (2014), which categorizes authoritarian regimes into four different types: personal, party, military, and monarchy. To code the practice of vertical succession norms, I rely on information from Kokkonen and Sundell (2014) and Brownlee (2006). The former provides information on monarchies that practiced vertical successions, and the latter includes a complete list of hereditary successions in modern autocracies that are not monarchies.[2] Data on rulers' tenure are from the the Archigos dataset (Goemans, Gleditsch, & Chiozza, 2009).

I should clarify that in the analysis of modern autocracies, I use de facto measure of vertical succession norms because succession rules in some regimes are unclear but we can clearly observe succession practices.[3]

One may argue that leaders must have exited office regularly in order to pass the throne to their sons, which implies a reverse causality. To alleviate this concern, I exclude first-generation leaders. For example, for North Korea, I exclude the first leader Kim Il-sung and only include his predecessors Kim Jong-il and Kim Jong-un. Excluding first-generation leaders should bias against my expectation. Eventually, the data covers 611 authoritarian leaders in 117 autocracies from 1946 to 2010.

Notes on States' Founders

Wey: the founder of Wey was one of the sons of the King Wen of Zhou.

Wu: the founder of Wu was one of the sons of the King Tai of Zhou.

Song: the founder of Song was one of the brothers of the King Zhou of Shang.

Jin: the founder of Jin was one of the sons of the King Wu of Zhou.

Cao: the founder of Cao was one of the sons of the King Wen of Zhou.

Chu: the founder of Chu was not descendant of the royal families of the Shang or the Zhou Dynasties.

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[2]I further exclude cases where the office was not succeeded by the ruler's child. Eventually the list of non-monarchy autocracies that practice vertical successions includes: Haiti from 1971-1986; Taiwan from 1975-1988; North Korea since 1994; Syria since 2000; Azerbaijan since 2003; Singapore since 2004; and Tonga since 2005.

[3]This measure is different from my main analysis where I use de jure measure of vertical succession norms.

Table A9: Ancestral Distance to the Royal Families of the Shang and the Zhou Dynasties

States	Ancestral Distance
Wey	Low
Wu	Low
Song	Low
Jin	Low
Cao	Low
Chu	High
Yan	Low
Qin	High
Cai	Low
Zhao	High
Yue	Low
zheng	Low
Chen	Low
Han	High
Wei	High
Lu	Low
Qi	Low

Yan: the founder of Yan was one of the sons of Duke of Shao, and Duke of Shao was one of the brothers of the King Wu of Zhou.

Qin: the founder of Qin was not descendant of the royal families of the Shang or the Zhou Dynasties.

Cai: the founder of Cai was one of the sons of the King Wen of Zhou.

Zhao: Zhao was created from the three-way Partition of Jin, and its founder was not directly related to the royal families of the Shang or the Zhou Dynasties.

Yue: the founder of Yue was one of the sons of Wuyu, and Wuyu was one of the sons of the sixth king of the Xia dynasty.

zheng: the founder of Zheng was one of the brothers of the King Xuan of Zhou.

Chen: the founder of Chen is the son in law of the King Wu of Zhou.

Han: Zhao was created from the three-way Partition of Jin, and its founder was not directly related to the royal families of the Shang or the Zhou Dynasties.

Wei: Wei was created from the three-way Partition of Jin, and its founder was not directly related to the royal families of the Shang or the Zhou Dynasties.

Lu: the founder of Lu was one of the sons of Duke Wen of Zhou.

Qi: the founder of Qi was Jiang Ziya. While Jiang Ziya was not related to the king of

Zhou by blood, he served as the de facto prime minister for the King Wen of Zhou and the King Wu of Zhou. And therefore it is fair to say Jiang Ziya was very close to the royal families of Zhou or he himself belonged to the royal families of Zhou.

Sources: Yang (2003).

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