The killing game: A theory of non-democratic succession

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A R T I C L E   I N F O

A B S T R A C T

The winner of a battle for a throne can either execute or spare the loser; if the loser is spared, he contends the throne in the next period. Executing the losing contender gives the winner a chance to rule uncontested for a while, but then his life is at risk if he loses to some future contender who might be, in equilibrium, too frightened to spare him. The trade-off is analyzed within a dynamic complete information game, with, potentially, an infinite number of long-term players. In an equilibrium, decisions to execute predecessors depend on the predecessors' history of executions. With a dynastic rule in place, incentives to kill the predecessor are much higher than in non-hereditary dictatorships. The historical illustration for our analysis contains a discussion of post-World War II politics of execution of deposed leaders and detailed discussion of non-hereditary military dictatorships in Venezuela in 1830–1964, which witnessed dozens of comebacks and no single political execution.

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> "*Who disagrees with our leadership, will get a spit into his face, a blow onto his chin, and, if necessary, a bullet into his head*".
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> Anastas Mikoyan, a USSR leader, quoting Mehmet Shehu, Albanian Prime Minister, at the 22nd CPSU Congress[1]

1. Introduction

On December 23, 1989, Nicolae Ceauşescu, a Romanian communist leader for 22 years, fled his residence in the presidential palace in Bucharest and was captured by army troops that revolted after mass protests against his rule erupted the day before. On December 25, after a two-hour military trial, he and his wife, a former first deputy prime minister and the President of Romanian Academy of Science, faced a firing squad (Siani-Davies, 2005). What did those who captured and executed Ceauşescu have in mind? Why would not they wait for a regular process of justice, which might have very likely ended the same way?

Scholars of democratic regimes recognized long ago the impact of political competition on both policies pursued by elected individuals and characteristic traits of individuals that are elected. In non-democratic regimes, which have recently become an area of intense interest of economists and political scientists alike, political competition plays an important role

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[1] On December 17, 1981, Mehmet Shehu was found dead in his bedroom with a bullet in his head, and officially declared to commit a suicide. Anastas Mikoyan, the only memver of Soviet leadership serving, without interruption, at top positions under Lenin, Stalin, Khrushev, and Brezhnev, died peacefully at the age of 80.

as well (Tullock, 1987; Acemoglu and Robinson, 2006; Besley and Kudamatsu, 2008; Kotera et al., 2015; Mulligan and Tsui, 2015). We do not study political positioning of contenders to the highest post and processes of coalition formation in dictatorships, though these certainly play a huge role. One reason for this is that basic cleavages, motivations, and tactics involved have certain resemblance – or at least important theoretical parallels – with those employed in well-studied democracies. In contrast, we focus on major decisions that any autocrat, unlike a democratically elected leader, has to make: first, what to do with the predecessor. Second, how to survive if forced out of power.[2]

Unlike democratic leaders, dictators can use imprisonment, torture, and executions of political opponents as means of staying in power; this has been recognized long ago (e.g., Friedrich and Brzezinski, 1956; Bueno de Mesquita et al., 2003; Svolik, 2012). Still, even most powerful dictators that, in principle, have power to use any means to achieve their personal goals, have to weigh expected costs and benefits of their decisions. Then they fail to spare predecessors and unsuccessful contenders as they fear their comebacks, they hire loyal but incompetent subordinates as they fear their betrayal, and they get overthrown as they cannot commit to retire on their own. They interact with other strategic individuals such as their predecessors – even those who are long dead – and their future successors – even those yet unborn, as well as with institutions, both long-term such as dynastic traditions and short-term such as a moratorium on capital punishment.

What is the downside of executing the enemy who lost the power struggle when it is possible to do so and then enjoy a period of quietness? The downside is that in this case, the current decision-maker might be executed himself once removed from power. Sparing the life of a person who lost a fight against the incumbent makes his rule more troubling in the short-run (he will for certain have a powerful competitor alive), but then he will enjoy a higher probability of being spared himself once he loses a fight in the future. Formally, any decision by a rational agent incorporates future enemies' opinion of him as a result of his actions. If dictator A executed his predecessor B, then dictator C, who eventually takes over A, is likely to kill A, being concerned about bloody reputation of A. This reputation would indeed matter for C, the decision-maker at the moment, since if A is spared then, upon taking power back from C, A would likely execute C. (Or, more precisely, this is what C would most naturally expect from A basing on A's reputation.) One immediate result is that once somebody takes over a bloody dictator, he might be 'bound' to become a bloody dictator himself.

This basic logic provides an immediate history-dependence: the current winner values his options differently depending on the type of his fallen enemy. It is an illustrative example of understanding institutions as equilibria, which elicit and pattern behavior of rational agents (Bates et al., 1998, see also North, 1981; Greif, 1997). Concepts of path-dependence of economic processes and multiple equilibria are inter-related since the pioneering work of Douglass North (North, 1981, 1990).[3] Acemoglu and Robinson (2001, 2003); see also Bueno de Mesquita et al. (2003), Lagunoff (2004) and Acemoglu and Robinson (2006) have developed a workable framework for dynamic analysis of political development.[4] However, the reliance on Markov-type dynamic models limit the ability of these theories to focus on mechanisms of path-dependence. Our focus on equilibrium reputational concerns allows us to go beyond the existing models by explicitly demonstrating the workings of such a mechanism.

Our institutional focus on a single decision – to kill or to spare – is obviously very limited, especially when contrasted to big institutional economics issues such as political economy of property rights or organization of trade (e.g. Greif, 2004). However, it is not without some clear advantages. First, historians working with large (or potentially large) and heterogenous data bases are often overwhelmed with the identification problem.[5] For example, any analysis of interaction between the leadership turnover and economic progress involves numerous idiosyncratic decisions on the researcher part even at the stage of data collection. With respect to killings, historical sources are less ambiguous: in most cases, there is no doubt whether an individual was or was not killed. (Motives of players are of course much more ambiguous, and are subject to various interpretations.) Second, a narrowly defined issue allows to broaden the base of sources for historic narratives to provide comparisons across regimes, space, and time, both historical and physical.

In our theory, the cost of executing a certain action is associated with the equilibrium response of a future player. There is a long tradition in economic science to study reputation in games with incomplete information, starting from seminal contributions of Kreps and Wilson (1982) and Milgrom and Roberts (1982). Here, we depart from this tradition and argue that many behavioral aspects of reputation could be successfully studied in a complete information environment.[6] Instead of keeping track of beliefs, we focus on equilibrium actions: the number of times a given politician has executed in the past. It is natural to think about one's history of executions as an important state variable; just as a person's propensity to commit a new crime depends on his criminal background. We show that every equilibrium has the following structure: each additional murder implies a higher probability of being punished (so there is no forgiveness or indulgence), until the

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[2] Recent theoretical studies of dynamics of non-democratic politics include Acemoglu and Robinson (2006), Acemoglu et al. (2004), Besley and Kudamatsu (2008), Bueno de Mesquita et al. (2003); Egorov and Sonin (2014), Padro i Miquel (2007), Svolik (2008, 2009) and Londregan (2015).

[3] As a theoretical concept, multiple equilibria appeared earlier. In the field of development, first models of multiple equilibria include Murphy et al. (1989, 1993).

[4] In Egorov and Sonin (2011), the dictator's strategy motivated by the desire to survive is analyzed within such a framework.

[5] See a note on General Blanco's life in Section 2, which, depending on different plausible interpretations, gives rise to markedly different succession lines in Venezuela.

[6] Bates et al. (2000), in an effort to justify their Analytical Narrative approach (Bates et al., 1998, 2000), argue that any use of model of incomplete information in a historical or political study should be avoided unless this "would imply ignoring a central feature of the puzzle under investigation".

probability of punishment reaches one. Once it does, fear of additional chance of being punished is no longer in effect, and the agent opts to execute every time.

Historically, understanding of idea of reputation for executions manifested itself in various laws and constitutional clauses. The idea of restraint in killing defeated political opponents might be the most basic of all constitutional constraints. The problem is addressed in the Hittite Telipinu Proclamation (van den Hout, 1997), which may be the world's oldest existing document of the West. After discussing the excessive number of revolts and civil wars, King Telipinu stipulates that high nobles should not be killed in secret, but should only be killed after a trial before the Council of the realm. Also, when someone is convicted of a treason, his innocent family members should not be killed, and his property should not be confiscated. The reason for the first rule is apparently to avoid provoking preemptive revolts, and the second rule could prevent forcing rebel's family members to support his rebellion (which would spur a sequence of reputation-based killings). Abolishment of confiscations might also be aimed at eliminating an incentive for palace bureaucrats to falsely accuse a noble of a treason. In the Appendix, we discuss some historical examples in detail.

The rest of this paper is organized as follows. Section 2 demonstrates that political comebacks to the top position in a non-democracy might be the rule, rather than an exception; thus, "the sparing equilibrium" is an empirically relevant concept. In Section 3, we introduce the formal game. Section 4 contains analysis of the game. Section 5 applies the theoretical insights to history of executions of disposed leaders in the last six decades. Section 6 concludes. Technical details can be found in the working paper version. The Appendix focuses on historical analysis of hereditary succession in the Ottoman Empire (1281–1922) and other European cases.

2. The politics of comebacks: Venezuela, 1832–1964

The history of Venezuela since early 19th century – we start with the year of 1830, the first year of full state independence – provides a vivid example that dozens of dictators that come and go need not be necessarily harsh on their predecessors (see Fig. 1).[7] One reason for relative exsanguinity at the very top was, as we argue, the equilibrium behavior of winners. Correctly anticipating a high probability to be removed from power, they opted for a mild treatment of their predecessors. Another reason was the absence of a royal family and/or aristocratic tradition, which made it impossible to significantly reduce the set of contenders. It could be argued that Venezuela in 1830–1964 provides a typical example of a Latin American country and polity; we identified comeback military rulers in almost every Latin American country.

For example, of 54 presidents and provisional rulers of Mexico in the 19th century, 17 have held this positions more than one time, and 7 came back to power at least two times. General de Santa Anna, "the Napoleon of Mexico", came back at least 5 times (and 11 by some accounts).[8] In Chile, General Ramon Freire came back 5 times. In Cuba, the last comeback dictator was Fulgencio Batista, who came to power twice (in 1933 and 1952) by means of a military coup (Domínguez, 1998). In Venezuela, among 56 changes in leadership (this figure includes all constitutional leaders – elected, military, and provisional), there were 14 comebacks by 10 leaders who had previously been constitutional leaders of the country. Needless to say, a comeback is the most visible sign that the person had not been executed after removal from power the previous time. On the other hand, some of the rulers indeed died in office or shortly after removal from power.

Among the generals that ruled Venezuela during 20 years after 1830, there are Jose Paez (1830–1835 and 1839–1843, president, 1861–1863, supreme dictator), Carlos Soublette (1837–1839, provisional president, 1843–1847, president, 1858, provisional president), Jose Tadeo Monagas (1847–1851, 1851–1855, 1868) and Pedro Gual (1859, provisional president, 1861, president). In 1837, 1848, 1858, 1859, 1861 (twice), 1863, and 1868, transition of power was hostile. Still, even in the exceptionally bloody 1858 turmoil that started the Federal War, the outgoing dictator Monagas, who had forced Paez in exile, was allowed to find a refuge first in the French embassy, and then to retire to France (only to come back ten years later).[9] Julian Castro, the president that removed Monagas in 1858 and was removed by Gual in 1859, was convicted for treason, but absolved. Páez staged unsuccessful coups in 1848 and 1849 against Monagas and was exiled (1850–1858). In 1861, Páez returned to become the supreme dictator.

The end of the Federal War brought General Antonio Guzman Blanco in to the center of Venezuelan political arena. He first became president in 1870 (before that he was acting president temporarily replacing General Falcon, his military principal during the Federal War, and the president in 1864–1868), ousting José Ruperto Monagas, a son of José Tadeo Monagas (the Monagas who was President in 1847–1851 and 1855–1858), who had been brought to power by the coup of 1868. In 1877, Guzman left the office and went to France. In 1880, after the death of President Linares (in 1878) and ouster of his short-lived successor Jose Gregorio Varela, Guzman returned to Venezuela and took power by a coup again.[10] Another

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[7] Our brief overview of Venezuelan leadership in historical perspective is based primarily on Munro (1950), Levine (1978), and Rudolph and Rudolph (1996).

[8] This would not be surprising if General de Santa Anna were a democratic politician, coming back and forth via elections. However, most of power changes were military coups.

[9] Jose Tadeo Monagas' younger brother, Jose Gregorio Monagas, who was president in 1851–1855, was put to jail after the coup of 1858 and died the same year.

[10] While some sources, e.g., Bueno de Mesquita et al. (2003), consider the period of 1870–1892 as that of an interrupted rule of Guzman Blanco, with those formally holding the presidency being his puppets, others read this as a story of hostile come-backs (e.g., Rudolph and Rudolph, 1996). It is doubtful that even a full-scale historical investigation of the matter would result in an unambiguous interpretation.
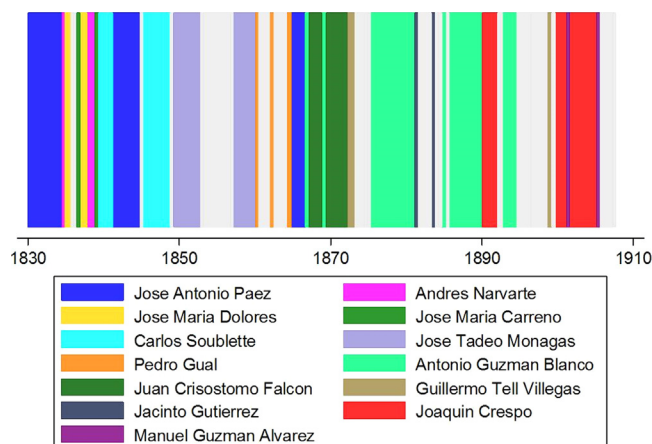
Fig. 1. Comebacks in Venezuela, 1830–1910.

comeback, Joaquin Crespo, was president first in 1884–1886 (replacing Guzman Blanco who left for Paris only to be back in 1886) and from 1892 to 1898, when he was killed during a revolt against his desired successor. Joaquin Crespo appears to be the only ruler of Venezuela in two centuries to be killed during or shortly after a coup; there is no evidence that he was executed rather than killed in a fight.

The first half of the 20th century was the era of Juan Vincente Gomez, who took power in 1908 and was formally a president or a provisional president in 1908–1914, 1915–1929 and 1931–1935. However, this might not be an illustrative example of a comeback president, since historians agree that, whatever has been his official position, he was the undisputed ruler of Venezuela since 1908 until his death in 1935.

The second half of the 20th century has changed the patterns of dictatorship, though the phenomenon of 'comeback rulers' persisted even with democracy gaining a more solid ground since the presidency of Rómulo Betancourt, who himself was a comeback military leader. After taking power in 1945, he was ousted by a military coup in 1948, was returned by another coup in 1958 and voluntarily left presidency in 1964. Since 1964, two Venezuelan politicians were presidents twice (they were barred from running for a second consecutive term by constitution), but each time they were elected in a democratic election.[11]

3. Formal setup

Time is discrete and infinite, indexed by $t = 1, 2, \ldots$. There is an infinite pool of identical politicians, and in every period one of the politicians is the incumbent *dictator*; we denote this individual by $D_t \in P$, with D_1 given exogenously. In every period, the dictator may be challenged by a *contender*, C_t (and if he is not challenged, we write, shortly, that $C_t = \varnothing$). If he is challenged, i.e., $C_t \neq \varnothing$, then there is a fight for power modeled as an unfair lottery, and we assume, for simplicity, that the dictator wins with probability $p \in (0, 1)$; thus, $p - \frac{1}{2}$ is a measure of "incumbency advantage" in nondemocratic struggle for power. The politician who wins becomes the winner (W_t) and the other becomes the loser (L_t); a dictator who did not face a contender wins automatically. The winner needs to decide the fate of the loser; he chooses one of the actions, E (for *execute*) or S (for *spare*). If the loser is spared, then he becomes the next period's contender; if the loser is executed, then in each of the subsequent periods there is a chance $\mu \in (0, 1)$ that a new contender is randomly picked from the pool (thus, the expected number of periods without a contender is $(1/\mu) - 1$). We assume that being executed is the only way to leave the political game; extending the results to the case where politicians can die or retire is straightforward.

We normalize the instantaneous utility of politicians who are inactive in a given period (not yet brought into politics or already left) to 0. The winner of the fight for power enjoys utility from being in office for one period $Y > 0$, and the person who is executed gets $-D < 0$. In addition, we allow the politicians to have non-pecuniary, moral cost from executing others: we assume that executing kth victim gives instantaneous disutility $h_k = h(k) > 0$, where $h(k)$ is a monotonically decreasing function. The latter reflects a decreasing marginal cost of killing yet another political opponent. All players share a common discount factor $\beta \in (0, 1)$.

To summarize, the timing of each period t is the following.

1. If there is a challenger ($C_t \neq \varnothing$), then D_t and C_t fight, and with probability p, the dictator wins ($W_t = D_t$ and $L_t = C_t$), otherwise the dictator loses ($W_t = L_t$ and $L_t = D_t$). If $C_t = \varnothing$, then the dictator wins automatically ($W_t = D_t$ and $L_t = C_t = \varnothing$).

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[11] Still, Carlos Andres Pérez, who was president in 1974–1978, and was elected again in 1989, survived two military coups during his second term, and was finally suspended from the office under charges of corruption.

2. The winner W_t decides whether to execute or spare the loser L_t, provided that $L_t \neq \varnothing$. If he spares, then $C_{t+1} = L_t$; if he executes, or if there was no fight (so $L_t = \varnothing$), then with probability μ, a new contender C_{t+1} is picked from the pool of politicians, and otherwise $C_{t+1} = \varnothing$. In either case, $D_{t+1} = W_t$.
3. The winner gets utility Y. If the loser is executed, the winner also gets $-h_k$ where $k \geq 1$ is the total number of executions committed by the current winner, and the loser gets utility $-D$ in this case. All other politicians, including the loser who is spared, get utility 0.

The equilibrium concept we use is (symmetric) Markov perfect equilibria, in pure or mixed strategies. Thus, each history is collapsed into a single payoff-relevant state, given by a pair (m, n), where m is the number of executions that the winner W_t had committed and n is the number of executions that the loser L_t had done (this is relevant because he may come to power again if spared). A symmetric Markov perfect equilibrium is, therefore, a set of probabilities $\alpha = \{\alpha_{m,n}\}_{m,n \in \mathbb{Z}^+}$, so that the winner in state (m, n) executes with probability $\alpha_{m,n}$.

In addition, we impose the following equilibrium refinement: we assume that for any m, the sequence $\{\alpha_{m,n}\}_{n=0}^{\infty}$ is nondecreasing in n. Intuitively, this means that the probability of being executed by a given winner cannot decrease with the number of executions n that one committed; in other words, past executions are at least not rewarded in equilibrium. This allows us to rule out equilibria such as "winners always execute, unless the winner executed ten times and the loser never did, or vice versa". In this equilibrium, a politician kill his opponents ten times before entering in a tacit agreement with the eleventh one to spare each other. We do not believe this is a reasonable equilibrium, and focus on the rest, which, as we will show, are Pareto ordered. In the working paper version, we proved that a number of alternative refinements result in exactly the same set of equilibria.

4. Analysis

The only decisions in this game are made by winners, and only in the case when there is a loser. Given our focus on Markov perfect equilibria, the only payoff-relevant variables are the number of previous executions that the winner and the loser committed (whether the incumbent or the contender won is not payoff-relevant). Thus, we can encode every history by a payoff-relevant state given by a pair (m, n), where m and n are the numbers of previous executions by the winner and the loser, respectively. An equilibrium strategy is therefore a mapping

$$\alpha: \mathbb{Z}^+ \times \mathbb{Z}^+ \to \Delta\{E, S\};$$

we will let $\alpha_{m,n}$ be the probability that action E is chosen in state (m, n) under strategy α. In addition, regardless of the state, in which the game starts, after the first execution it will always be in a state (m, n) where either $m = 0$ or $n = 0$. We thus restrict attention to equilibrium behavior in such states.

In every state (m, n), the winner acts as to maximize

$$U_{m,n}^W = \max\left(U_{m,n}^E, U_{m,n}^S\right),$$

where $U_{m,n}^E$ and $U_{m,n}^S$ are his utilities from executing and sparing, respectively. Let us also denote $U_{m,n}^L$ to be the utility of the loser and U_m^N to be the utility of the dictator who did not face a contender in this period; in addition, let $U_{m,n}^I$ be the utility of an incumbent who faces a contender but does not know the outcome of the fight yet. These four values are linked to each other and to $U_{m,n}^W$ by the following equations, which held for every m and n:

$$U_{m,n}^E = Y - h_{m+1} + \beta(1-\mu)U_{m+1}^N + \beta\mu U_{m+1,0}^I;$$
$$U_{m,n}^S = Y + \beta U_{m,n}^I;$$
$$U_{m,n}^L = (1-\alpha_{m,n})\beta\left(pU_{m,n}^L + (1-p)U_{n,m}^W\right) - \alpha_{m,n}D;$$
$$U_m^N = Y + \beta(1-\mu)U_m^N + \beta\mu U_{m,0}^I;$$
$$U_{m,n}^I = pU_{m,n}^W + (1-p)U_{n,m}^L.$$

In addition, in equilibrium, we must have

$$U_{m,n}^W = \alpha_{m,n}U_{m,n}^E + (1-\alpha_{m,n})U_{m,n}^S.$$

We start by considering the following two benchmarks: what happens if a particular politician decides to always kill, and anticipates to never be spared, and what if he decides to always spare and expects to be killed with some probability. In these cases, the solutions are particularly easy.

First, suppose that a winner, who has already killed m times, plans to always execute, and be immediately executed upon losing. In this case, to calculate his utility, we can substitute $U_{m,0}^W = U_{m,0}^E$, and after some manipulations obtain that $U_{m,0}^W$ is given by

$$U_{m,0}^W = Z(m) = \frac{Y - \beta\mu(1-p)D}{1 - \beta(1-\mu+\mu p)} - \sum_{k=1}^{\infty}\left(\frac{\beta\mu p}{1 - \beta(1-\mu)}\right)^{k-1}h_{m+k}.$$

Since h_k is decreasing in k by assumption, $Z(m)$ is increasing in m, with the limit

$$Z(\infty) = \frac{Y - \beta\mu(1-p)D}{1 - \beta(1 - \mu + \mu p)},$$

and its minimum value is obtained at $m = 0$:

$$Z(0) = \frac{Y - \beta\mu(1-p)D}{1 - \beta(1 - \mu + \mu p)} - \sum_{k=1}^{\infty} \left(\frac{\beta\mu p}{1 - \beta(1-\mu)} \right)^{k-1} h_k.$$

Second, consider a scenario where a winner in state (m, n) commits to always spare the loser; this locks him into dealing with the same opponent forever. If the loser's strategy is to execute with probability $\alpha_{n,m}$ (the equilibrium strategy in the state where he is the winner), then his utility is $V(\alpha_{n,m})$, where $V(x)$ is given by

$$V(x) = \frac{(1 - \beta p + x\beta p)Y - \beta(1-p)xD}{\beta(p + \beta - 2p\beta)x + (1-\beta)(1 + \beta - 2p\beta)}.$$

Notice that $V(x)$ is a decreasing function of x (intuitively, a lower probability of being executed increases utility).

In what follows, we make the assumption that h are sufficiently small. Namely, we want to ensure that in the absence of equilibrium punishment, moral cost is not sufficient to deter execution.

Assumption 1. The ratio h_1/Y satisfies

$$\frac{h_1}{Y} < \frac{\beta(1-\mu)(1-p)}{(1 - \beta + \beta\mu)(1 + \beta - 2p\beta)}.$$

If Assumption 1 holds, a winner that does not expect to get any punishment has expected continuation utility $Z_0^S = \frac{(1-\beta p)Y}{(1-\beta)(1+\beta-2p\beta)}$, and, if he executes, faces a new challenge with probability μ every period. Thus, we must have

$$Z_0^S < \sum_{k=0}^{\infty} (\beta(1-\mu))^k \left((1-\mu)Y + \mu Z_0^S \right) - h_1,$$

which, after simplification, yields the condition.

Assumption 1 is more likely to hold when the probability that a new challenger appears, μ, is small, the dictator's incumbency advantage p is small, or the discount factor β is large. Indeed, executing makes little sense if μ is large and thus it is unlikely to buy a period where the dictator rules unchallenged. It is also unnecessary if p is large, because incumbency advantage is then strong enough to guarantee staying in power even if there are opponents; lastly, a low β implies that staying in power in the future is not worth the current cost.

Our first result characterizes the cases, in which a unique equilibrium exists.

Proposition 1. *If $Z(0) > V(0)$, then there exists a unique equilibrium. In this equilibrium, everybody executes: $\alpha_{m,n} = 1$ for all (m, n). If $Z(0) \leq V(0)$, then there exist multiple equilibria. In particular, the following two equilibria always exist: an equilibrium, in which everyone executes ($\alpha_{m,n} = 1$ for all (m, n)), and an equilibrium, in which $\alpha_{m,n} = 1$ for all $(m, n) \neq (0, 0)$ and $\alpha_{0,0} = 0$.*

This result suggests that there always exists a "killing" equilibrium; if $Z(0) > V(0)$, this equilibrium is unique. This condition holds for a wider range of parameters if h are low and μ is low. Indeed, this condition ensures that even if executing implies zero chance of survival after losing political power, whereas sparing ensures that the politician will always be spared, executing is still optimal. If this does not hold, there are multiple equilibria, and as we will see below, the "killing" equilibrium is Pareto inferior.

In what follows, we will characterize the whole set of equilibria, and show that there is a Pareto superior one. Our first observation is that we can bound the utility of the decision-maker (the winner) from below. Indeed, if the state is (m, n) and he commits to always spare, then he gets exactly $V(\alpha_{n,m})$, as $\alpha_{n,m}$ will be the rate at which the current loser would execute him if there is such chance. The incumbent cannot do worse than that, and so $U_{m,n}^W \geq V(\alpha_{n,m})$. Of course, if sparing is a best response i.e., if ($U_{m,n}^S \geq U_{m,n}^E$), then $U_{m,n}^W = V(\alpha_{n,m})$. Similarly, we must have $U_{m,n}^W \geq Z(0)$, as this is the worst the incumbent can get if he decides to execute everyone from now on.

Our next step, which easily follows from the previous observations, is to show that the following 'talion law' must hold in every equilibrium: In every state (m, n), the winner executes with probability 1 if and only if he expects to be executed for sure.

Proposition 2 (*The Talion Law*). *In any (symmetric Markov perfect) equilibrium, for any pair (m, n), the four conditions $U_{m,n}^E > U_{m,n}^S$, $U_{n,m}^E > U_{n,m}^S$, $\alpha_{m,n} = 1$, and $\alpha_{n,m} = 1$ are equivalent.*

Proof. In equilibrium, $U_{m,n}^E > U_{m,n}^S$ must imply $\alpha_{m,n} = 1$ by the definition of equilibrium, and, similarly, $U_{n,m}^E > U_{n,m}^S$ must imply $\alpha_{n,m} = 1$. At the same time, $\alpha_{m,n} = 1$ implies $U_{n,m}^E > U_{n,m}^S$ (and, similarly, $\alpha_{n,m} = 1$ implies $U_{m,n}^E > U_{m,n}^S$); if this were not true, we would have $U_{n,m}^E \leq U_{n,m}^S$ and thus $U_{n,m}^W = V(1)$, whereas executing could guarantee $Z > V(1)$. This gives us a chain of implications $U_{m,n}^E > U_{m,n}^S \Rightarrow \alpha_{m,n} = 1 \Rightarrow U_{n,m}^E > U \Rightarrow \alpha_{n,m} = 1 \Rightarrow U_{m,n}^E > U_{m,n}^S$. $\square$

This result implies the following structure on the probabilities of execution. If $\alpha_{0,n} = 1$ for some n, then $\alpha_{0,n'} = 1$ for all $n' \geq n$ by monotonicity, and then by Proposition 2, $\alpha_{n',0} = 1$ as well. At the same time, if $\alpha_{0,n} < 1$, then $\alpha_{0,n'} < 1$ and $\alpha_{n',0} < 1$ for all $n' \leq n$. Furthermore, it is easy to show that for at least some m, $\alpha_{m,0} = 1$ should hold. Indeed, the sequence $\{\alpha_{0,n}\}$ is monotone in n and bounded, which means that for n sufficiently high, its adjacent terms are arbitrarily close to each other by the Cauchy criterion. Intuitively, this means that an increase in expected probability of being executed when committing an additional execution is marginal at best, and thus for n high enough, it is a dominant strategy for a winner in state $(n, 0)$ to execute. We thus have proved the following proposition.

Proposition 3. *In any equilibrium where not all $\alpha_{m,n}$ equal 1, there exists some upper bound $M \geq 0$ such that $\alpha_{m,0} = \alpha_{0,m} = 1$ for $m > M$ and $\alpha_{m,0} < 1$, $\alpha_{0,m} < 1$ for $0 \leq m \leq M$. Moreover, if $m < m' \leq M$, then $\alpha_{0,m} < \alpha_{0,m'} < 1$.*

We interpret M as the degree of '*tolerance*' in a given equilibrium. Specifically, M is the maximum number of executions that leave a politician with a positive chance of being spared.

Proposition 3 also implies that $\alpha_{0,m} \neq 0$ for $m > 0$. Consider two politicians who already executed their opponents (m and m' times, respectively), but not more than M times. In that case, $\alpha_{m,0} = \alpha_{m',0}$. Indeed, in this situation, $\alpha_{0,m} \in (0,1)$ and $\alpha_{0,m'} \in (0,1)$, consequently, $U_{0,m}^E = U_{0,m}^S$ and $U_{0,m'}^E = U_{0,m'}^S$. But executing either of the two politicians gives the same benefits to the winner in states $(0,m)$ and $(0,m')$; formally, we have

$$U_{0,m}^E = Y - h_1 + \beta(1-\mu)U_1^N + \beta\mu U_{1,0}^I = \frac{Y + \beta\mu U_{1,0}^I}{1 - \beta(1-\mu)} - h_1 = U_{0,m'}^E.$$

Consequently, $V(\alpha_{m,0}) = U_{0,m}^S = U_{0,m'}^S = V(\alpha_{m',0})$.

In other words, if executing these two politicians yields the same utility, then so should sparing them, and this is only possible if both present an equal risk. This means that there is a certain threshold $\alpha^* \in (0,1)$ such that $\alpha_{0,0}$ is either 0 or α^*, $\alpha_{m,0} = \alpha^*$ for $1 \leq m \leq M$, and $\alpha_{m,0} = 1$ for $m > M$. We have thus proved that the path of executions by a given politician follows the following pattern: it starts with a fixed probability α^* and proceeds in this way until there are M executions, and after that the politician switches to always executing the opponent.

How do incoming leaders punish those who committed numerous executions? To find out, we need to look at the payoffs in more detail. First, as we already argued, the payoffs of politicians who executed more than M times are given by the function $Z(m)$; namely, if $m > M$, then $U_{m,0} = U_{m,0}^E = Z(m)$, and also $U_{M,0}^E = Z(M)$. Moreover, $U_{M,0}^E = U_{M,0}^S$, unless $M = 0$.

Suppose that in some state $(m,0)$, the winner is indifferent between executing and sparing. This means that his utility is $U_{m,0}^W = V(\alpha_{0,m})$. At the same time, if he executes, he gets

$$U_{m,0}^E = Y - h_{m+1} + \beta(1-\mu)U_{m+1}^N + \beta\mu U_{m+1,0}^I$$
$$= \frac{Y + \beta\mu U_{m+1,0}^I}{1 - \beta(1-\mu)} - h_{m+1}$$
$$= \frac{Y + \beta\mu(U_{m+1,0}^S - Y)/\beta}{1 - \beta(1-\mu)} - h_{m+1}$$
$$= \frac{(1-\mu)Y + \mu U_{m+1,0}^S}{1 - \beta(1-\mu)} - h_{m+1}.$$

This means that if in two states $(m,0)$ and $(m+1,0)$, the winners are indifferent between executing and sparing, then the probabilities of them being executed if they lose are linked by the following equation:

$$V(\alpha_{0,m}) = T_{m+1}(V(\alpha_{0,m+1})),$$

where T_{m+1} is a mapping defined by

$$T_k(x) = \frac{(1-\mu)Y + \mu x}{1 - \beta(1-\mu)} - h_k.$$

This mapping satisfies $T_k(x) > x$ on the relevant domain, which corresponds to the condition that sequence $\{\alpha_{0,m}\}$ is increasing in m.

We are now ready to formulate the main result. First, let $\overline{M}$ be the maximal value such that

$$T_1 \circ T_2 \circ \cdots \circ T_{\overline{M}-1} \circ T_{\overline{M}}(Z(\overline{M})) \leq V(0)$$

(this $\overline{M}$ is well-defined whenever $Z(0) \leq V(0)$, which is precisely the case where there is an equilibrium where sparing is possible, because of Proposition 1). This figure $\overline{M}$ will be called the *maximum tolerance*, as this will be the maximum number of executions that a dictator might have and still expect to be spared, in equilibrium, with a positive probability.

More precisely, we have the following result.

Proposition 4. *Suppose $Z(0) \leq V(0)$. Then all equilibria other than the one where everyone always executes may be obtained as follows. Take any M such that $0 \leq M \leq \overline{M}$. Then, there exists an equilibrium such that*:

(i) *For $m > M$, $\alpha_{m,0} = \alpha_{0,m} = 1$;*

(ii) *For $0 < m \leq M$, $\alpha_{0,M} = V^{-1}(Z(M))$, and $\alpha_{0,m} = V^{-1}(T_{m+1} \circ \cdots \circ T_M(Z(M)))$;*
(iii) *For $0 < m \leq M$, $\alpha_{m,0} = \alpha^*$, where $\alpha^* = V^{-1}(T_1 \circ \cdots \circ T_M(Z(M)))$;*
(iv) *Either $\alpha_{0,0} = \alpha^*$ or $\alpha_{0,0} = 0$.*

Thus, there exist equilibria with any tolerance, up to maximum tolerance $\overline{M}$. In any equilibrium, any politician who ever executed an opponent keeps doing so at a fixed rate α^*, and expects to face an increasing punishment (probability of being executed). Once this instrument runs out, i.e., he anticipates to be executed with certainty, he no longer has incentives to spare, and commits to killing with probability 1.

If $\alpha_{00} = 0$, then on the equilibrium path players 1 and 2 always spare each other, and replace each other in power. The mean duration of each subsequent rule can be calculated as follows:

$$1 + \sum_{n=1}^{\infty} n(1-p)^{n-1}p = p\sum_{n=0}^{\infty} n(1-p)^{n-1} = -p\frac{d}{dp}\sum_{n=0}^{\infty}(1-p)^n = -p\frac{d}{dp}\left(\frac{1}{p}\right) = \frac{1}{p}.$$

Since we may have multiple equilibria, a natural question is about selection. Fortunately, equilibria are Pareto-ranked, and, not surprisingly, everyone prefers to be in the equilibrium with maximum patience $M = \overline{M}$. More precisely, we have the following result.

Proposition 5. *If $Z(0) \leq V(0)$, which is necessary and sufficient for existence of a non-killing equilibrium, the equilibrium with the maximum patience $M = \overline{M}$ and $\alpha_{\{0,0\}} = 0$ maximizes the utilities of both the winner and the loser in every decision node, and it is the only equilibrium to do so. In other words, it is a unique renegotiation-proof equilibrium.*

Assuming that this best equilibrium is played, we obtain the following classification of equilibrium paths as a function of the parameters. If $Z(0) > V(0)$, then every politician executes in every decision node; in fact, this is the only equilibrium. If $Z(0) \leq V(0)$, then the equilibrium path critically depends on the initial state. If the society starts in the state where the two politicians had not executed before, then there are no executions along the equilibrium path; since we ruled out exogenous death, these two will alternate in power forever. If, however, the society starts with one of the politicians having a history of executions, then in every decision node there is a positive probability of an execution, and the frequency of executions in equilibrium is lower if $\overline{M}$ is lower. Thus, the following comparative statics results describe the equilibrium executions.

Proposition 6. *The maximum equilibrium tolerance $\overline{M}$ is increasing in $\frac{D}{Y}$, μ (the rate of arrival of new contenders following execution of the previous one), and p (incumbency advantage).*

In other words, tolerance increases with the size of punishment, which is very intuitive, since a harsher punishment makes a person more fearful of it, and increases incentives to spare. A higher p implies more stability of the dictator's position and more time until losing a fight, which also decreases incentives to execute. Finally, a higher μ means that one is less likely to experience a period of safe rule in the case of execution. This also makes execution less profitable.

5. Modern politics of executions and comebacks

Post-World War II political patterns provide a rich material for students of leadership dynamics outside the developed world. Although there have been some successful early attempts to use regression analysis to get meaningful results (e.g., Londregan and Poole, 1990), there are some difficulties that make case studies and comparative analysis more appealing. In particular, available samples of killed leaders and failed contenders are heavily truncated with respect to deliberate killings. Indeed, while deaths of leaders are typically well-documented, those of failed contenders are much less so. If such a death took place immediately after an alleged coup, then, even though the ultimate circumstances of death are uncertain, it can be classified as a political killing. (The death of Lin Biao, Chairman Mao's designated successor, is such an example.) However, classification of a suspicious death of an opposition leader not connected to any noticeable political turmoil rests with the researcher's judgement. (E.g., the death of Eduardo Frei, a former President of Chile, who was voicing opposition against the Pinochet dictatorship in 1982 remains a controversy until today. See Londregan, 2000; also, *The Santiago Times*, April 5, 2005).

In this section, we do not venture to write a comprehensive history of leaders' killings in modern politics. Such an attempt would have required a work of a different scope. The topic spreads wide from classics of Conquest's "Big Terror" to books focused on very specific episodes of political killings. Rather, we try to look at the great variety of distinct episodes through a lens of our theory: a killer reputation on either the ruler or the unsuccessful contender part enhances the probability of a new killing; high stakes for the decision-makers forces them to put more emphasis on loyalty than on competence of their subordinates. What we emphasize is that political killings, which are often tended to be seen as idiosyncratic and isolated unless they are committed by the same ruler or regime, allow for singling out a number of strategic interdependencies.[12]

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[12] The degree of personalization reached its nadir in Togo, where the leader of the 1963 coup, Colonel Eyadéma, who then became president in 1967 (and held the post until his death in 2005), claimed to have personally fired the shot which killed the overthrown President Olympio.

Examples of countries that have witnessed at least two killings of the fallen leaders during the last 50 years include Afghanistan (Mohammad Daoud, 1978, Mohammad Taraki, 1979, Hafizullah Amin, 1979), Bangladesh (Mujibur Rahman, 1975, Khalid Musharaf, 1975, Ziaur Rahman, 1981), Iraq (Faisal II, 1958, Nuri as-Said, 1958, Abdul Karim Kassem, 1963), Nigeria (Abubakar Tafwa Balewa, 1966, Johnson Aguiyi-Ironsi, 1966, Murtala Ramat Muhammad, 1974), Comoros (Ali Soilih, 1978, Ahmed Abdallah Abderemane, 1989), and Liberia (William Tolbert, 1980, Samuel Doe, 1990) Other rulers killed during this period include Melchior Ndadaye in Burundi (1993), Carlos Castillo Armas in Guatemala (1957), Thomas Sankara in Burkina Faso (1987), Long Boreth in Cambodia (1975), Sylvanus Olimpio in Togo (1963), François Tombalbaye in Chad (1975), and Nicolae Ceausescu in Romania (1989).

A special list can be made of democratically elected leaders that were overthrown by a coup such as Salvador Allende of Chile (1973); our model emphasizes an important incentive to kill a legitimate and popular leader as he or she is an obvious comeback threat. Finally, there have been violent deaths of leaders not connected to a serious attempt to change the political regime – though aimed to change specific policies associated with a particular leader – e.g., of Anwar as-Sadat in Egypt (1981), Indira Gandhi in India (1983), René Moawad in Lebanon (1989), Yitzhak Rabin in Israel (1995), or Laurent Kabila in Congo (2001). It should be noted that all these samples are heavily truncated since they do not take into account many unsuccessful contenders that were killed during a coup or executed thereafter.

5.1. Communist-type dictatorships

Hundreds of monographs and thousands of papers have been written on the subject of communist dictatorships (see Gregory and Harrison, 2005, for an up-to-date account of economic literature on Stalin's dictatorship; Montefiore, 2003, for references to historical accounts). What the theory emphasizes is that the scale of high-profile executions, an easily observable variable, might serve as a proxy for the degree of institualization of a regime, which is much less observable. There are ample reasons to take the end of the World War II as the starting point for the following reason: in the Soviet Russia, which was in many ways a source and an impostor of political patterns for newly emerging communist dictatorships, the war years marked – at least in the standard historic account – the ultimate accumulation of power in hands of one person, Joseph Stalin. However, it seems more instructive to focus on the " brinkmanship cases" of 1950s. Before that period, falling from power was all but a death sentence, and by early 1960s leadership execution all but stopped at least in European communist dictatorships. Taubman (2003, p. 249) observes "What finally turned Khrushchev against Beria was fear that Beria would get him if he did not get Beria first".

While widespread repressions are usually aimed at reducing *ex ante* incentives to rebel (e.g., Conquest, 1968; Friedrich and Brzezinski, 1956), individual killings cannot be understood in the same fashion. When actors are endowed with reputation, and interaction between players is put in a dynamic perspective, even economic – that is, rational and selfish – agents are no longer involved in an anonymous game. The Hungarian example of 1956 is a case in point (see Remnisz, 2003, Sebestyen, 2006, for a detailed historical account).

In 1956, after a decade of communist rule, an apparently disorganized uprising in Hungary led to removal of the ruling hard-liners. Shortly after the communists lost control in Budapest, Soviet troops took over and installed Janos Kadar, a former interior minister, as a head of the Hungarian state. Kadar's rule started with the trial and execution of nearly two hundred democratic activists. The generally applied principle was that only those who were responsible for the deliberate killing of government and communist party officials were to be executed. These measures have been followed with a number of reforms aimed at broadening the political base for the Kadar's government. In particular, a significant share of recently nationalized, especially agricultural, firms was returned to their previous owners. In 1958, Imre Nagy, the political leader of the 1956 revolution, who had been held by Yugoslav and then Soviet authorities for two years, was given over to the Kadar government, still reliant on Soviet troops to maintain control. After a show trial, he was executed. With Nagy alive or dead, the set of possible political coalitions would have been the same, but the absence of another focal person gave Kadar the time to solidify his grip on power (Sebestyen, 2006).

In Romania, Nicolae Ceausescu was the supreme leader since 1965. By academic standards, the history of his dramatic fall from power and death is a complete mystery. However, even the very scarce information, basically confined to the public events, allows to illuminate traces of strategic reasoning. On December 21, 1989, after days of local and seemingly limited unrest in the province of Timisoara, Ceausescu called a grandiose meeting at the central square of Bucharest, apparently to rally the crowds in support of his leadership. In a stunning development, the meeting degenerated into the anarchy, and the Ceausescu couple had to flee the presidential palace. The next day saw the announcement of death of Vasile Milea, the defence minister. Though there is very little doubt that he was killed and not committed suicide, the official version from the first day up until now, whether he was actually killed on Ceausescu's orders to prevent a coup, or by the emerging military leadership out of fear that he may intervene on the Ceausescu's side. The actual composition of pre-coup forces, at least at the personal level, is a subject of much controversy up until now (Siani-Davies, 2005). Anyway, the killing was strategic and apparently raised stakes for all the parties involved.

On December 25, Ceausescu and his wife were caught by a provincial military unit and executed by a firing squad after a two-hour trial in somewhat mystic circumstances. (E.g., though the proceeding and the execution were taped and later broadcasted, not all the judges have ever been identified). Still, there is ample evidence that the strategic reasoning behind the swift execution was exactly as predicted by our theory. In 1995, testifying before the parliamentary commission investigating the matter, General Gelu Voican Voiculescu, who in 1989 was appointed by the Romanian revolutionary

government to supervise the trial and burial of the Ceaușescus: "The decision to try the couple was dictated by desire to survive – either them, or us."

5.2. Third-world dictatorships

Until 1980, Liberia had a century of relatively peaceful rule by the oligarchic True Whig party; presidents were typically replaced by their vice-presidents. This political "idyll", which accompanied a century of economic prosperity (see, e.g., Acemoglu and Robinson, 2006), ended on April 12, 1980, when colonel Samuel Doe staged a military coup, killing President William R. Tolbert, Jr. and mass-executing members of the deposed government. A year later, a Doe's co-conspirator against Talbot, Thomas Weh Syen, was arrested along with four other members of the People's Redemption Council, the highest governing body under Doe, for allegedly plotting to assassinate Doe; they were executed in a matter of days. So, when in 1989 another former ally of Doe, Charles Taylor, started a guerrilla war against him, there was no chance for Doe to survive the deposition. He was captured in the presidential palace in Monrovia on September 9, 1990 and killed immediately.

Afghanistan was a hereditary monarchy until 1973, when Mohammed Daoud Khan seized power from his cousin King Zahir. In April 1978, Daoud Khan was overthrown by a revolution and executed, with most of his family, immediately thereafter. This mass execution, reported publicly as a "resignation for health reasons", established a firm pattern for the next transitions of power. In April 1978, Nur Mohammad Taraki became the President of the Democratic Republic of Afghanistan and secretary general of the quasi-Marxist PDPA party. In September 1979, Taraki was killed in a military coup led by his prime-minister, Hafizullah Amin, who then became the second President of the Democratic Republic of Afghanistan. Three months later, in December 1979, Amin and many of his followers were killed in a revolt assisted by the Soviet military. Babrak Karmal, another member of the Taraki junta, became the next President. installed by the Soviets, he became the only leader of the communist Afghanistan to survive after being removed from power, when he was replaced by the Soviet authorities in 1986.

In the neighboring Pakistan, the recent political history has been very much consistent with our equilibrium story. It started with an execution of a replaced popular leader Zulfiqar Ali Bhutto, the first President of the Republic since the split with the East Pakistan in 1971, by the new military leader Zia ul-Haq on charges of murdering an opposition politician – as if for a further illustration of our story. Then the ruthless leader died in an air accident, and the number of succeeding power transitions, not always democratic, were peaceful, at least at the very top. The two immediate predecessors of the next dictator, former Commander-in-Chief Pervez Musharraf, were banished rather than executed, and there are reasons to believe that this was in part due to Musharraf's concern about his own future.

6. Conclusion

Most advanced analyses of political and economic history draw insights from studies of large-scale institutional change. The challenge we took upon is to reconcile historical processes with micro decisions made by significant decision-makers at critical points in history. We study reputation and knowledge in a complete information game with an infinite number of players. The rational winner of a power struggle determines the fate of the loser. His equilibrium choice of strategy is motivated by two basic considerations: first, he is willing to increase the probability of survival by reducing the set of potential contenders. Second, he fears that a bad reputation would serve him poorly should he in turn become the loser. One conclusion that we are able to illustrate employing a historical narrative is the existence of markedly different equilibria paths. Between 1830 and nowadays, Venezuela witnessed a larger number of successful hostile comebacks of leaders that were deposed earlier. In a drastic contrast, in the Ottoman Empire, a hereditary monarchy, a typical move by a new ruler was to try to kill all the potential contenders to the throne.

Appendix A. Historical examples

As the analytic narrative approach (Bates et al., 1998, 2000) suggests, theoretical models, a primary tool of economics and political science, allow us to read, organize and present empirical evidence in a narrative form, which is a primary tool of historical science. There are two basic reasons for this form of organizing discussion: first, econometric inference of empirical content of multiple equilibria models, even if data is well-identified, is an arduous task. Second, problems of identification and interpretation of historical data related to leadership survival make analytic narrative a more appropriate tool of analysis.

To illustrate the existence of two paths with markedly different characteristics, we consider a few examples. In the text (see Section 2) we have considered non-hereditary succession in Venezuelan politics, 1830–1970, which followed the

"sparing path". Below, we first discuss the evidence from two major European empires, the Ottoman Empire, where the dynastic succession spanned six centuries, 1299–1922, and the Russian Empire. Finally we look at the history of England.

A.1. The Ottoman Empire

The Ottoman Empire was not a place where succession was automatic; any male descendant of Osman, with no regard to seniority, could become a sultan (Finer, 1997, p. 1171). Often, there were brothers succeeding the deposed dictator; the fact that most of sultans had many children made competition for succession serious. The difference between non-monarchies and monarchies, which is predicted by our comparative statics, is that in a monarchy, the set of potential contenders is limited and pre-defined (e.g., all brothers, sons, and nephews); accordingly, it might really make sense to try to eliminate all potential contenders.

The House of Osman ruled the Ottoman Empire from 1299 to 1922; officially, the sultan was the sole source of governmental authority in the empire. During more than six centuries covered in the list of the Ottoman sultans, there was almost no hostile comebacks. The main reason for this was that, after a coup, the loser, be it the incumbent or the contender, was usually executed.[13] Still, by many standards, the Ottoman Empire resembled European monarchies. Alderson (1982) notes that average duration of an Osmanli sultan's reign (17 years), compares favorably with those of Roman emperors (7 years), Byzantine emperors (12), Abbasid caliphs (12) and is close to European monarchies such as Russia (18), France (21) and Britain (23).[14] Still, Alderson (1982) counted 17 depositions from Bayezid I to Abdul-Hamid II, almost half of all sultans. Executions of predecessors, failed contenders, or just potential contenders such as younger brothers, was indeed widespread. At least 11 sultans were killed during or soon after a hostile disposition from power. Of the sultans that were not killed upon the accession of a new sultan, four were the last sultans of the Empire in the period of 1876–1922; one of them, Murad V, ruled for only 93 days in 1876 and was widely believed to suffer from mental illness. Therefore, it is safe to conclude that killing the predecessor was a typical strategy in the Ottoman Empire.

Another course of actions, typical for the Ottoman Empire and all but unseen in Venezuela, was killing of potential heirs to the throne. Beyazid I (1389–1402), Mehmed I (1413–1421), Mehmed II (1444–1445, 1451–1481), Murad II (1421–1444, 1445–1451), Selim I (1512–1520), Suleiman I (1520–1566), Mustafa IV (1807–1808), Mahmud II (1808–1839) put some of their brothers or sons (and often other relatives) to death. Mehmed III (1595–1603) stays notorious even in this long list for having his sixteen brothers killed upon his accession. His son, Ahmed I broke with the pattern, refusing to execute his mentally retarded brother Mustafa I (1617–1618, 1622–1623). Mehmed II enacted the 'Law of Fratricide', which said literally that a sultan may lawfully put his brother to death. Alderson (1982) counted 80 such executions in the 650-year span.

The tradition to kill potential contenders persisted even in 19th century. In 1808, a janissary revolt brought to power Mustafa, a son of Abdul-Hamid I. Mustafa ordered execution of his brother Selim, the disposed sultan, as well as his other brother, Mahmud. Selim was killed, but Mahmud, the only remaining male member in line for succession, escaped, revolted against Mustafa, and had him executed upon succession to the throne.

A.1.1. Russia

It is plausible again to juxtapose the Ottoman Empire experience with that of the Russian Empire. As in the Ottoman Empire, the Russian Empire has had a well-defined sequence of absolute rulers for a prolonged period, since early 14th century, and the difference in average durations is minimal (17 and 18, respectively). In Russia, we witness both (i) less deliberate killings of predecessors and (ii) more examples of people being removed from power, but spared. There might be only single execution of a heir by the current ruler (prince Alexis, who was accused of conspiring in the plot against his father Peter the Great; the ultimate circumstances of Alexis's death are unknown, e.g., Massie, 1980)[15]. and a single episode of a son successfully, though passively, participating in a plot against his father (Alexander I against his father Pavel I in 1801). There were examples that people were removed from power or succession line and not executed (Vasily Shuisky, Sophia, a half-sister of Peter the Great, Peter the Great himself, Ivan VI, Konstantin).[16]

To further illustrate how different degree of security affected the winner's attitude to the mere presence of potential contenders, compare accessions of two young women, Elizabeth I of Russia in 1741 and Catherine II (the Great) in 1762.[17] Each of them was brought to power by a military coup organized by young officers of elite guard divisions. Elizabeth I

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[13] The first 'comeback' in the Ottoman Empire was not a result of a hostile fight between the predecessor, Murad II, and his son, Mehmed II. Indeed, During his first reign, seeing the upcoming Battle of Varna, Mehmed sent for his father, Murad II, asking him to claim the throne again to fight the enemy, only to be refused. Enraged at his father, who was then retired to rest in southwestern Anatolia, Mehmed in his famous letter wrote to his father: If you are the sultan, come and lead your armies. If I am the sultan I hereby order you to come and lead my armies. It was upon this letter that Murad II led the Ottoman army in the Battle of Varna in 1444. (Alderson, 1982, p. 62 details more hostility in both accession and temporary deposition of Mehmed.) The second 'comeback' (1622) also appears to be very specific, as Mustafa I, reportedly mentally retarded p. 1172, (Finer, 1997), was merely a 'façade' king.

[14] We use the following sources on the Ottoman Empire: Alderson (1982), Finer (1997), McCarthy (1997), and Palmer (1992).

[15] Ivan the Terrible's son Ivan was killed by his father in a quarrel; however, there is a lot of evidence that it was accidental

[16] In contrast with the Ottoman Empire, killing of non-rivaling siblings was near-taboo in Russia since the very early years: in 1217, Prince Gleb Vladimirovich of Ryazan was thrown out by citizens of his state after ordering to kill his brothers, princes of neighbouring states, at a dinner table. The first Russian saints of the Orthodox Church were young and innocent princes Boris and Gleb, killed by their brother Svyatopolk. Of course, Russian princes have had less legitimate consanguineous brothers than Ottoman rulers

[17] Women occupied the Russian throne for more than a half of the 18th century, and most of them were brought to power by a military coup.

removed the one-year old tsar, Ivan VI, and his parents, who were the regents designated by the predecessor, Empress Anna, Elizabeth's cousin. Upon Elizabeth's accession, Ivan VI was not killed but isolated and guarded in different fortresses, and his parents were exiled. Catherine II removed from power her husband, Emperor Peter III, who was designated as a successor by Elizabeth. Though Peter III was not executed immediately after the removal from power, he was assassinated within two weeks by people Catherine sent to 'watch him'. Archives contain a hand-written note by one of the assassins, where he proudly reports the death of Catherine's husband. Furthermore, Ivan VI, who had been spared by Elizabeth and kept in prison for 22 years, was killed soon on Catherine's order by his guards, fearful of a plot to rescue him.

The crucial difference in attitude of Elizabeth and Catherine to those whom they removed from power and who could be expected to become if not the center, but at least a focal element of opposition, might be in that Elizabeth was a daughter of Peter the Great, the Russian tsar in 1696–1725, and thus was a heir at least as legitimate as those whom she replaced.[18] In contrast, Catherine was a daughter of an obscure count in Prussia (Germany), and was 'imported' to marry Peter III, who was a great-grandchild of Peter the Great and a nephew of the reigning Empress Elizabeth. Thus, Catherine, the 'illegitimate' ruler, had to take much more care of contenders' fates than Elizabeth.

The Russian history provides another example of the sparing equilibrium, a power struggle of two boyar clans each of which had a boy contender to the throne. In 1669, Maria Miloslavskaya, the first wife of tsar Alexis, died and was survived by 4 children, including ailing sons Fedor and Ivan. Two years later, in 1671, Alexis married Natalya Naryshkina, and the whole clan of Miloslavskys, including Maria Miloslavskaya's father, but not Fedor and Ivan, went into exile. In 1672, son Peter was born. In 1676, Alexis died, Fedor was proclaimed tsar, and the Miloslavskys (including grandparents of Fedor) were returned, while Naryshkins were exiled (but not killed).

In 1682, tsar Fedor died, and his half-brother Peter, aged ten, was proclaimed tsar. Fedor's brother Ivan, 16, who was burdened with several chronic illnesses, conceded to Peter's accession and was kept in the Kremlin palace unharmed, while the Naryshkins (including the former first minister Artamon Matveev, tsarina Nataliya's guardian) were returned from exile. In a few days, the most important Naryshkins, including Artamon Matveev, were killed in a military uprising, Sophia Miloslavskaya became regent, formally on behalf of her brother Ivan and half-brother Peter. Though Peter, a single royal male in the Naryshkins clan, was in hands of Miloslavskys, his life was not threatened. In 1689, Peter acceded to power in bloodless coup; Sophia was kept under house arrest for rest of her life (until 1704). The essence of the story is that, despite very strong incentives and excellent opportunities on each side to kill the heir representing the rival clan, they deliberately abstained from that.

A.1.2. England

European monarchies of the era witnessed significantly fewer executions and killings of kings, though it was not impossible. (And, of course, the fate of numerous contenders was very often miserable.) E.g., Richard III of England was immortalized by Thomas More and William Shakespeare for slaying the baby-king Edward V and his brother Richard in an attempt to secure the crown for himself.[19] The young princes, sons of the previous king Edward IV of England, were declared illegitimate by the Act of Parliament known as Titulus Regius; however, the act of parliament was legally reversible, which made them a potential threat for Richard III.[20] Execution of Mary Stuart of Scots by Elizabeth I of England was apparently aimed at reducing the probability of a pro-Stuart coup. In 1685, James Crofts, Duke of Monmouth, a bastard child of Charles II of England, was executed within nine days after capture (cf. typically long trials of other British royals in 17th century). The apparent reason for that was he proclaimed himself James II, the king of England, thus endangering the power of the existing king, also James II, his uncle.[21] Even executions of kings committed by revolutionaries (e.g. Charles I of England, Louis XVI of France, and Nicholas II of Russia, whose mere existence – even after abdication – made them contenders to power), were in part motivated by considerations highlighted by our theory .[22]

In a fundamental study of patterns of political succession in England, Bartlet (2002) notes that between the 11th and early 14th, defeated political opponents of high birth were …scarcely ever maimed or killed in cold blood. However, in the Celtic part of British Isles, the kings and princes of Wales, Ireland, and Gaelic Scotland continued to employ blinding, maiming, and killing in their conflicts with rivals from both with-in and with-out their families (Bartlet, 2002). Bartlet and earlier medieval studies such as Pollock and Frederic Wiliam Maitland (1898) contrast the virtual absence of royal-member executions in Norman and Angevin England with the bloodiness of the later Middle Ages and Tudor period. Fig. 2 at the end

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[18] Although Elizabeth was unable to accede to power without a military coup (which happen in 1742), she was named a heir to the throne by her mother (who died in 1727, when Elizabeth was 18), who in turn inherited the throne from Peter the Great, her husband, in 1725 (Massie, 1980).

[19] Historians do not universally take More's account as authentic. Still, there is no doubt that the 'Princes in the Tower' were killed, and the primary motive was elimination of potential heirs to the throne, either for the benefit of Richard III, Henry VII, or even of Duke of Buckingham, also a descendant of Edward III (see Fig. 2 at the end of the paper).

[20] Bartlet (2002) provides an example of situation where, against all odds, King Stephen did not kill 6-years old William Marshal (a future regent of England), given to him as a hostage by his father John.

[21] As in the case of Princes of the Tower, being a bastard (a legal term at that time) does not automatically exclude the person from the set of legitimate contenders.

[22] A famous example of the 'elimination strategy' is the Slaughter of Innocent. Upon hearing the prophecy that he would be dethroned by the just-born 'King of the Jews', King Herod ordered to kill all male children under two years of age in Bethlehem.
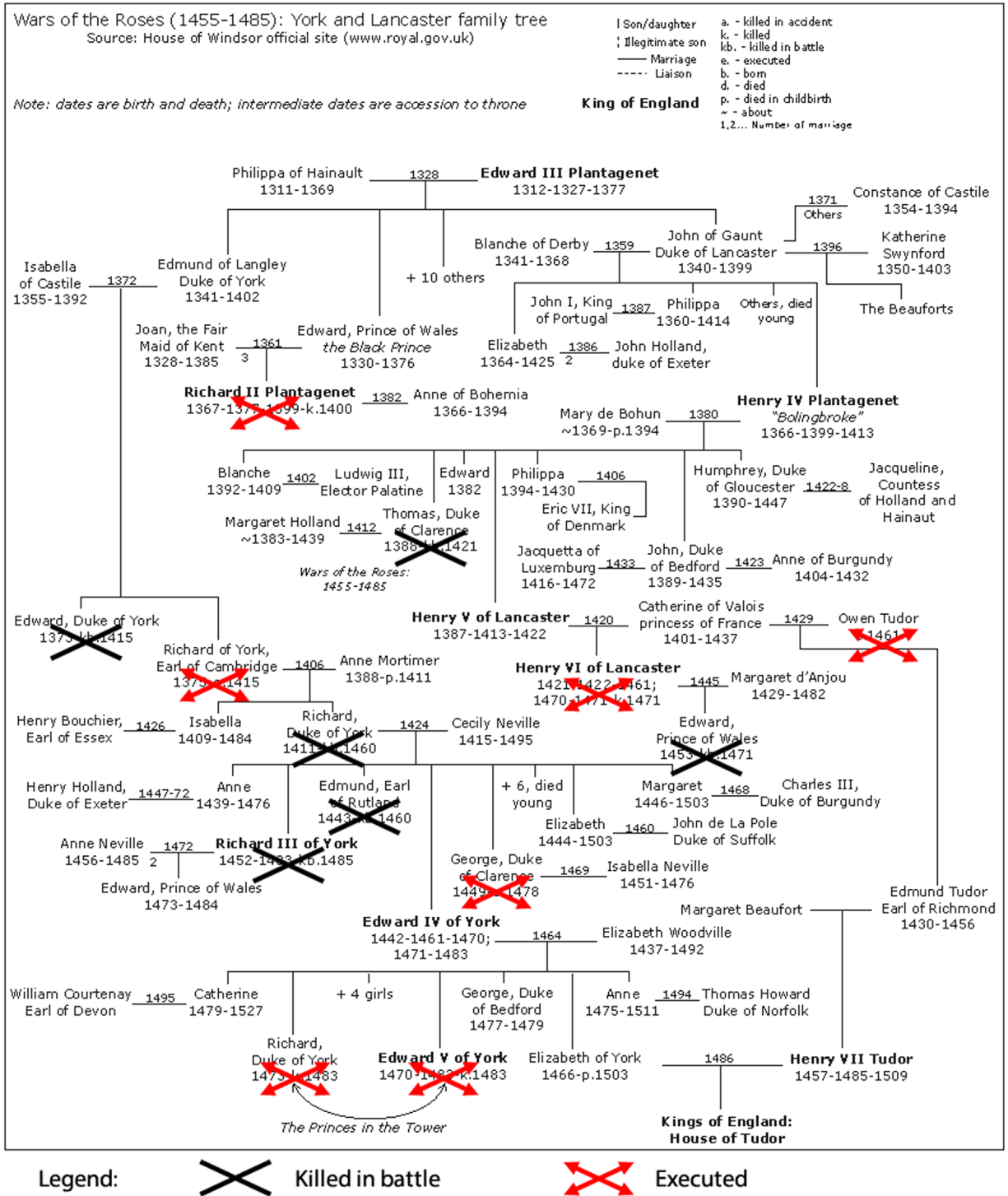
Fig. 2. Killing equilibrium in the War of Roses (1455–1486).

of the paper illustrates that by 1486, the last year of the thirty years of the War of Roses, the only surviving male from both houses of York and Lancaster was the ruling king, Henry VII. Both chronological (in 1455–1486 in contrast to the previous period) and geographical (Celtic part vs. Wales, Ireland, and Gaelic Scotland, in 1075–1225) concentration of killings support the idea of history-dependence highlighted by our theoretical model.

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