The problem of succession

Preliminary draft

For discussion only

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Abstract

The self-interested ruler will not name a successor. Instead, he will prefer to rely on a tacit rule of succession, in which longevity confers legitimacy.

[JEL D72, D81]

1. Introduction

For most organizations, steady growth depends in part on the passing of the crown. For instance, Russia's disruptive transitions of power may have robbed it of stability and wealth [3]. The problem of succession extends beyond governments: Many disputes in admissions, employment and promotion concern how best to allocate vacant positions.

Where no rule of succession is accepted by all, the organization may fall back upon an implicit rule: If the current leaders have long held power, then they must deserve to stay in power. For example, after the political turmoil of the Time of Troubles in Russia, early in the 17th century, the acceptance of the Romanovs as rulers (if not of a particular Romanov) seems to have increased with their duration in power.

This note proposes a model of the likelihood that a cadre of leaders will last under the implicit rule of longevity. With refinement, such models may eventually help analysts anticipate turning points in countries that lack a credible constitution.

2. Analysis

2.1. The longevity of the regime

A *regime* is the period in power of a group that identifies with a family, area or policy. Let i index the number of years that a given regime has continued, $i = 1, 2, \ldots$. Let $X_n = i_n$ denote that the regime, in year n, has been in power for i years. The probability of extending a regime depends only on the variable X_n. The longer that a regime has remained in power, the more likely that it will remain in power for one year more. Denote the probability that the regime will extend from i years to $i + 1$ as $P_{i,i+1}$. We can draw upon the analysis of Markov processes [4] to state the probability more precisely:

$$P_{i,i+1} = P\{X_{n+1} = i_n + 1 | X_n = i_n\} = f(i_n),\ f' > 0.$$

Either the regime continues for one more year, or it stops:

$$P_{i,i+1} + P_{i,i} = 1.$$

As a special case, regimes that rarely regain power after losing it may be stylized with

$$P_{i,i} = 1 \ when \ X_{n-1} = i.$$

The probability of continuing the regime depends simply on longevity. So, specify the model in a simple way:

$$P_{i,i+1} = 1 - p^{i_n} \tag{2.1}$$

and

$$P_{i,i} = p^{i_n} \tag{2.2}$$

where $0 < p < 1$.

To estimate the model, equate p to the value that just renders $P_{i,i+1} < .5$ when a given regime actually ends. The model may then be used to crudely predict the duration in power of a similar cadre where there is no widely accepted rule of succession.

An example comes from the tumultuous politics of Mexico between the 1910 revolution and World War II. During that period, several coups deposed elected leaders (see table) [1]. The mean length of term was 3 years ($\sigma = 2$). Thus $p^3 = .5$, or $p = .8$. Under these conditions, a regime that remained in power for 10 years would have had a 90 percent chance of continuing for at least one more year.

President of Mexico	**Start date**
Francisco Madero	1911
Victoriano Huerta	1913
Venustiano Carranza	1914
Àlvaro Obregòn	1920
Plutarco Elìas Calles	1924
Àlvaro Obregòn	1928
Portes Gil	1928
Ortiz Rubio	1930
Abelardo Rodrìguez	1932
Làzaro Càrdenas	1934
Manuel Àvila Camacho	1940

2.2. The ruler's choice of a law of succession

Why doesn't the ruler adopt a clear law of succession? Because such a law will remove all uncertainty only if it covers all contingencies; and it is in the immediate interest of the ruler not to do so. Instead, he can increase his power by playing off potential successors against one another for as long as he can.

The ruler seeks a degree of eligibility for successors that will maximize over time his welfare function, which may (or may not) reflect the welfare of his nation. This problem, for the ruler, is deterministic: Given any positive probability $P_{i,i+1}$ of extending the regime for a year, the ruler will plan now to maximize his welfare for his remaining rule, regardless of what will actually happen.

Let s be the share of all feasible candidates who are declared eligible for succession, $0 \leq s \leq 1$. In short, s is the law of succession. The ruler receives utility from power, which increases in s, a function of time t: $U[s(t)]$, $\partial U/\partial s > 0$, $\partial^2 U/\partial s^2 < 0$. But the welfare of the nation, W, decreases as s increases, since an unclear law of succession creates uncertainty. For $W[s(t)]$, $\partial W/\partial s < 0$, $\partial^2 W/\partial s^2 < 0$. When picking the law of succession at time 0, the ruler expects to remain in power until time T. The welfare of the nation from time T on may be summarized in the function $Z[s(T)]$, $\partial Z/\partial s < 0$, $\partial^2 Z/ds^2 < 0$.

The ruler chooses the function $s(t)$, $0 < t \leq T$, given $s(0) = s_0$, to maximize

$$V = \int_0^T \delta_1 U[s(t)] + \delta_2 W[s(t)]\ dt\ + (1 - \delta_1 - \delta_2) Z[s(T)], \tag{2.3}$$

where δ_i are welfare weights.

Any solution $s^*(t) < 1$ to the static problem in (2.3) must satisfy

$$\delta_1 \frac{\partial U}{\partial s} \leq -\delta_2 \frac{\partial W}{\partial s}$$

for $0 < t < T$, and

$$\delta_1 \frac{\partial U}{\partial s} \leq -\delta_2 \frac{\partial W}{\partial s} - (1 - \delta_1 - \delta_2) \frac{\partial Z}{\partial s}$$

at $t = T$. The purely self-interested ruler ($\delta = 1$) will never narrow the field of successors ($s^*(t) = 1,\ 0 < t \leq T$). If he has some interest in current national welfare but none in the future, then he will again pick a constant rule of succession. If he has some interest in the future, then he will pick a rule of succession that narrows the field discontinuously at time T. That is, $s^*(T) << s^*(T - \epsilon)$. He will name just one successor only if he is purely altruistic ($\delta_1 = 0$).

If a permanent rule of succession L has been imposed on the ruler, then his choice of $s(t)$ is constrained to $0 < s(t) \leq L \leq 1$. If the rule is to be imposed at time T_1, then $L = 1$ for $t < T_1$. Neither case changes the economic substance of the solution: The ruler will not name the successor unless compelled to do so.

2.2.1. The dynamic problem

Suppose that narrowing the field of potential successors increases the probability of an illegal removal, such as an assassination, of share A of the successors, $0 \leq A \leq 1$, as now-disappointed pretenders seek the throne through violence. Then model $A = A[s'(t), t]$ where $\partial A/\partial s' \leq 0$. Also, $\partial A/\partial t \geq 0$: The increasing longevity of the regime may increase the probability of an assassination, particularly when the regime permits pretenders few nonviolent means of challenge.

Broaden the ruler's own welfare function to $U_1[s(t), A(t)] = U_2[s(t), s'(t), t]$. Again, $\partial U_2/\partial s > 0$. But also, $\partial U_2/\partial s' = (\partial U_1/\partial A)\ \partial A/\partial s' \geq 0$: Adding candidates to the list may make assassination less likely for the leader as well as for the successors.[1]

Also assume that $\partial U_1/\partial A = 0$ when $A = 0$: The ruler risks nothing from a mild threat arising from a risk-free environment. Finally, assume that $\partial U_2/\partial t \leq 0$: As time passes, the ruler loses room for bargaining, until he can no longer delay naming a successor.

Likewise, rewrite society's welfare function as $W_1[s(t), A(t)] = W_2[s(t), s'(t), t]$. Here, $\partial W_2/\partial s < 0$: Given that the list of potential successors includes the best

[1] If the ruler's life is not at risk, then he may gain bargaining power from threats to remove some of his potential successors. In that case, $\partial U_1/\partial A > 0$. That renders $\partial U_2/\partial s' \leq 0$.

candidate, extending the list can only create uncertainty.[2] Also, $\partial W_2/\partial s' \geq 0$ in a society where the risk of assassination is large enough: Widening the list reduces the risk of assassination and of subsequent uncertainty.[3]

Generalize the objective functional to:

$$V_1 = \int_0^T \delta_1 U_2[s(t), s'(t), t] + \delta_2 W_2[s(t), s'(t), t] \; dt \; + (1 - \delta_1 - \delta_2) Z[s(T)].$$

$A(T)$ is not an argument in Z: The perceived probability of an assassination affects current welfare, but only the actual deed would have lasting effects.

Now $s^*(t)$ must satisfy the Euler equation [2]

$$\delta_1 (\frac{\partial U}{\partial s} - \frac{\partial U_{s'}}{\partial t}) = -\delta_2 (\frac{\partial W}{\partial s} - \frac{\partial W_{s'}}{\partial t}) \tag{2.4}$$

for all t.

In a society where assassination is common, the ruler may increase his bargaining power by delaying a sudden expansion of the candidates' list until near the end of the regime. Thus $\partial U_{s'}/\partial t > 0$. At the same time, as pressure for

[2] At the end of his regime, the ruler has gained all that he can from negotiations with potential successors. As a citizen, it is then in his interest to select the strongest candidate for the nation.

[3] In a society where assassination is unlikely, extending the list of successors more rapidly may accelerate uncertainty. In that case, $\partial W_2/\partial s' \leq 0$.

assassination rises toward the end of the regime, society will gain more from a sudden release of that pressure. Thus $\partial W_{s'}/\partial t > 0$. These conditions imply that $\partial U/\partial s$ is a larger number than when assassination is rare – and thus that s is smaller. The intuition is that the ruler can gain from maintaining a short list of successors until late in his regime, when a sudden expansion may most benefit him.

2.2.2. Endtime conditions

Suppose that the ruler can also choose both the expected length of his regime $\overline{T}$ and the succession rule at the end $s(\overline{T})$. Then, at the optimal endpoint, $t = \overline{T}^*$, $s(t)$ must satisfy — in addition to (2.4) — the transversality conditions

$$\delta_1(U - \partial U/\partial s'\ s') + \delta_2(W - \partial W/\partial s'\ s') = 0 \tag{2.5}$$

and

$$\delta_1\ \partial U/\partial s' + \delta_2\ \partial W/\partial s' = 0. \tag{2.6}$$

The transversality conditions are satisfied if: The risk of assassination is reduced to zero ($A = 0 \rightarrow \partial U/\partial s' = \partial W/\partial s' = 0$); and the regime continues until the moment in which it benefits neither the ruler nor the ruled ($U(\overline{T}^*) = W(\overline{T}^*) = 0$).

Suppose that the constitution constrains the length of the regime to T but that the ruler may choose $s(T)$. For example, negotiations may limit the duration of dictatorial or colonial rule but let the ruler specify the set from which his immediate successor will be chosen. That choice must satisfy (2.4) and (2.6) but need not satisfy (2.5). The ruler may satisfy the transversality condition by expanding the pool of eligible pretenders until the risk of assassination is zero, but the constitution may prevent him from extending the regime until exhausting its benefits of the moment.

Suppose that the ruler may choose $\overline{T}$ but an imposed rule of succession constrains $s(\overline{T})$. His choice must satisfy (2.4) and (2.5) but need not satisfy (2.6). To satisfy the transversality condition, the ruler must choose to end his regime at a moment when the pool of eligible pretenders is expanding ($s' > 0$); or continue his regime until exhausting all immediate benefits and then fix the size of the pool of pretenders during that endtime ($U(\overline{T}^*) = W(\overline{T}^*) = s'(\overline{T}^*) = 0$).

The last necessary conditions at T are variants on Kuhn-Tucker conditions. If the ruler can choose the rule of succession at T,[4]

[4] If $0 < s^* < 1$, then $\partial Z/\partial s = 0$. If $s^* = 0$, then $\partial Z/\partial s \leq 0$. If $s^* = 1$, then $\partial Z/\partial s \geq 0$. The condition $s^* \partial Z/\partial s \geq 0$ summarizes these cases.

$$(1 - \delta_1 - \delta_2) s^*(T) \frac{\partial Z}{\partial s} \geq 0. \tag{2.7}$$

If he can choose T ,

$$(1 - \delta_1 - \delta_2) \frac{dZ}{d\overline{T}} = (1 - \delta_1 - \delta_2) \frac{\partial Z}{\partial s} \frac{\partial s}{\partial \overline{T}} \leq 0$$

where, if $\partial s / \partial \overline{T} < 0$, then $s^*(\overline{T}) = 0$. If the ruler puts any weight on the future, if he can choose the length of his regime, and if the rule of succession narrows the eligible pool toward the end of his regime, then he will choose exactly one successor. The intuition is that he continues to rule, and thus to narrow the pool, until only one successor remains.

3. Conclusions and reflections

Only the altruistic ruler will rationally choose to lay down a rule of succession that covers all contingencies, since he will otherwise gain by dividing and conquering his potential successors. Rather than plan his succession, it is in his political interest to cling to power as long as possible, since his perceived legitimacy increases with longevity.

An implicit rule of succession is inefficient for society in part because it generates uncertainty. Just as the lack of a monetary rule may encourage unanticipated inflation and thus discourage saving, the lack of an explicit rule of succession may discourage people from investing in political knowledge over the long term. That may hamper the cultivation of a stock of leaders. Instead, there is an incentive for political speculation. An implicit rule may have encouraged many of the palatial intrigues for power that "had conferred on the Russian 18th century the spirit of a serialized light opera" ([3], page 96), until Paul I specified male primogeniture as the rule of succession for the Romanovs at the turn of the 19th century.

A theoretical question of interest is how to resolve the paradox of rulers who will not choose their successors and who will resist the imposition of a successor since that would reduce their power.

References

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