The Logic of Hereditary Rule: Theory and Evidence*

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Abstract

Hereditary leadership has been an important feature of the political landscape throughout history. This paper argues that it can play a role in improving economic performance when it improves intertemporal incentives. We use a sample leaders between 1848 and 2004 to show that economic growth is higher in polities with hereditary leaders but only when executive constraints are weak. This finding is mirrored in policy outcomes which affect growth. There is also evidence that dynasties end when the economic performance of leaders is poor suggesting that hereditary rule is tolerated only where there are policy benefits. Finally, we focus on the case of monarchy where we find, using the gender of first-born children as instrument for monarchic succession, that monarchs increase growth.

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"There are many ways to wish a king well; but the king's subjects, .. have more reason to be sincere when they say "long live the king." If the king anticipates and values dynastic succession, that further lengthens the planning horizon and is good for his subjects." (Mancur Olson, 1993 page 571).

"To the evil of monarchy we have added that of hereditary succession; and as the first is a degradation and lessening of ourselves, so the second, claimed as a matter of right, is an insult and imposition on posterity." (Thomas Paine, 1776)

1 Introduction

Over the sweep of human history, some form of autocratic rule has been the normal state of affairs. Only in the past two hundred years have alternatives cemented themselves in which leaders are subject to formal contests for power and subject to executive constraints imposed by independent courts and legislatures. Hereditary rule in the form of monarchy or dynastic dictatorship are an important example of autocratic rule. The utility of hereditary rule has been much debated. Olson (1993) who, as the quote above shows, argued that the possibility of hereditary rule could create an incentive for good governance. But others, most notably Paine (1776), argued strongly against it as form of government.

This paper looks at hereditary rule in theory and tests the specific predictions of a simple model which argue that its impact should be heterogeneous depending on whether there are executive constraints in place. And we find that growth is stronger in countries with hereditary leaders only if executive constraints are weak. With strong executive constraints, there is no advantage from having an hereditary leader which we argue is due to the fact that executive constraints serve as an alternative means of controlling leaders. For the case of monarchy specifically, we are able to address the potential concern about the endogeneity of hereditary selection by showing that our main result holds when we use whether a monarch or their predecessor had a first-born son as an instrument for whether a monarchic succession occurs.

The argument that we develop to motivate a role for hereditary rule exploits the insights from classic political agency models such as of Barro (1973).[1] The core general idea is that the development of "reputations" can

[1] See Besley (2006) for a review of the political agency literature.

be used to control moral hazard problems in politics. There is now a large literature on relational contracts in industrial organization which develops these arguments for principal agent problems that arise within firms (see, for example, Malcomson, 2013). Myerson (2008, 2010) has developed theoretical arguments related to those in this paper. He notes that political leadership is held in trust and that controlling moral hazard is central to good leadership being maintained. He also emphasizes the role of a selectorate in enforcing implicit "contracts" forged between citizens and leaders by controlling access to power.

More generally, the paper is related to an emerging literature on political dynasties. Blood ties between politicians of different generations are common in both autocratic and democratic systems. In the data introduced below, we find that 6.4% of all leaders since the mid nineteenth century have been from a hereditary dynasty; this percentage falls to 3.1% in democracies.[2] Dal Bo, Dal Bo and Snyder (2009) document historic and geographic patterns in the evolution and profile of political dynasties in the U.S. since 1789. Using a regression discontinuity design, they argue that dynastic political power is self-perpetuating with a positive exogenous shock to a person's political power having persistent effects on holding political power. Querubin (2010) looks at political dynasties in the Philippines using a similar approach and finds an even stronger effect of a political advantage through a family connection on holding power. Querubin (2011) finds that there is no effect of introducing a term limit on the persistence of family power.

Interest in hereditary rule is part of a wider interest in the role of elites in acquiring and maintaining political power in different settings. Perhaps the most famous statement on this topic is the celebrated work by Mosca (1939) and Pareto (1901). Tullock (1987) argued that hereditary transitions of power were part of a wider strategy for sustaining elite control in autocracies since it provides a means of insulating the elite from potentially destabilizing power struggles. Brownlee (2007) studies transitions of power in a sample of 258 post war autocratic leaders who rule for at least three years. He argues that hereditary succession tends to be accepted by ruling elites when there are no formal party structures to regulate transitions of power.

This paper is also related to the large literature on dynastic control in

[2] This increases to 9% and 11% respectively if we use a broader definition of dynastic leader.

firms and whether firms suffer from being controlled by family members – see, for example, Benedsen et al (2007), Bloom and VanReenen (2007), Burkhart et al (2003) for discussion of aspects of this. In general, these studies have found that family-owned businesses are run more poorly than other firms. However, we are not aware of studies that have studied whether there is heterogeneity in the performance of family run firms depending on governance arrangements in place, for example by outside investors.

The remainder of the paper is organized as follows. In the next section, we introduce the data and explore some background facts about hereditary rule in the raw data. In particular, we constrast the personal characteristics of hereditary and non-hereditary rules. Section three discusses the theoretical framework which motivates a specific test and underpins the interpretation of the empirical findings. Section three presents some evidence on how hereditary leaders affect policy and growth. It also discusses whether low growth increases the chances that hereditary leadership comes to an end. This section also present results where the probability that a dynastic line of monarchs continues depends on whether a monarch's first-born child is a son. Section four concludes.

2 Background Facts

To identify the leader in each country and year, we use the Archigos data set which covers the period between 1875 and 2004.[3] We classify a leader as hereditary if they had either a parent or grandparent who had been head of the state. We identify such leaders from information that we collected on which of the leader's relatives, specifically their parents, grandparents uncle, brother, cousin, spouse, or brother-in-law has held a broadly defined

[3] Archigos has two datasets: one which gives information on leader, year and country, and one which gives information only on leader and country. In the latter data there are 95 leader-country observations that do not appear in the former. In our analysis, we include these 95 observations which are for the following countries: Barbados, Bahamas, Belize, Brunei, Cape Verde, Iceland, Luxemburg, Maldives, Malta, Montenegro, Solomon Islands, Suriname, Tiber, Transvaal, Zanzibar. We extend the data back to 1848 for a few countries. Many countries have more than one "head of state". The Archigos data identifies the actual effective ruler based on a judgement about the particularities of each country. Two rules are generally followed: (i) in Parliamentary regimes, the prime minister is coded as the ruler while in Presidential systems, it is the president; (ii) in communist states the Chairman of the Party is coded as the effective ruler.

political position. To capture this, we included both high office such as a Prime Minister, President or King along with lesser positions such as a Member of Parliament or a Mayor. In a small number of cases that are relevant, we also maser their relationship to Clan Chiefs, Religious Leaders or Samurai.

This information comes mainly from the *Encyclopedia of Heads of States and Governments, Oxford Political Biography: Who is Who in the Twentieth Century World Politics, Encyclopedia Britannica*, other online sources, and biographies contained in *Lexis-Nexis*. Using these sources, we have a core sample of leaders in 197 countries between 1848 and 2004 out of a potential sample of 227 countries. Picking one leader per year this gives us a total of 2097 leaders, and a total of 2484 leader-spells in office.[4]

We find that 6.4% of the leaders in our sample are classified as hereditary according to our core definition. We begin by looking at the prevalence of hereditary leaders and how it has changed over time. Hereditary leadership has been in decline in countries that were already independent before 1900; around 8.3% of leaders between 1848 and 1900 are classified as being hereditary compared to 4.2% for the period between 1950 and 2004.[5] Among newer countries, i.e. those which appear in the data later than 1900, around 7.7% have hereditary leaders. There is no significant correlation between the year in which a leader comes to power and whether he is classified as being hereditary.[6]

The strength of executive constraints plays a key role in the theoretical framework and our core measure of this comes from the Polity IV data base.

[4]In cases where more than one leader is in office in a given year, we focus on the leader who has been in office for the longest time period during the year.

[5]This broadly similar to the findings for the U.S Congress where Dal Bo et al (2009) find that the 8.7% of new entrants have a previous political connection using data between 1789 and 1996. They also find that this proportion has not fallen much over time.

[6]It is interesting to relate whether a politician is dynastic to opportunities to replace leaders as captured by three PolityIV variables: (i) the extent of institutionalization – or regulation – of executive transfers (XRREG), (ii) the competitiveness of executive selection (XRCOMP), and (iii) the openness of executive recruitment (XROPEN). This summary variable takes values between 1 and 8, with 8 being the most open and competitive method of selection. This variable is strongly correlated with our measure of whether a politician belongs to a political dynasty. Around 3% of leaders are from dynasties in the political systems where the value of this dummy variable is 8 compared to 10% for the sample where the value of this variable is less than 8.

We use the variable *xconst* which captures how leaders are bound by institutional constraints on a scale between 1 and 7. Limits on the chief executive may, for example, be imposed by any "accountability group" in the polity. In many democracies these constraints are imposed by the legislative and judicial branches of government. Other kinds of accountability groups are the ruling party in a one-party system, a council of nobles or powerful advisors in monarchies, and the military in coup-prone polities. We work with a dummy variable which equals one if a country in a particular year has *xconst* equal to 7, i.e. the highest possible score. We refer hereafter to a country where this dummy variable is equal to one as having *strong executive constraints.*

Table 1 uses data from Besley and Reynal-Querol (2011) to look at some observable characteristics of hereditary and non-hereditary leaders; we also disaggregate this according to whether executive constraints are strong or weak. Hereditary leaders are less educated, being less likely to have a college degree and graduate qualification. This is mainly driven by those who take office in countries when executive constraints are weak. In strong executive constraints countries, hereditary leaders are more likely to have studied abroad. Hereditary leaders come to office on average when they are younger (42 years old versus 53) and they also tend to serve for longer in office, 11.5 years in office compared to 5 for nonhereditary leaders. This difference is greatest for those who take office when executive constraints are weak. Hereditary leaders are more likely to have served in the military, are less likely to have been elected and, unsurprisingly, are much more likely to belong to royal families, i.e. be from monarchies. In terms of careers, hereditary leaders are less likely to have had careers as lawyers, professors/scientists and are also less likely to have business background.

In our sample of leaders, 46% of leader spells fall under strong executive constraints. This actually increases rather modestly over our sample period; from around 40% in the nineteenth century to a little over 50% for the last twenty-five years of the sample. However, this reflects the fact that many countries that enter our data in later years tend not to have strong constraints. Indeed, the *proportion* of countries in our sample with strong executive constraints actually falls after World War II in comparison to the inter-war period.

Figure 1 further illustrates the time-series pattern of hereditary. The red line is drawn for all leaders and shows a general downward trend. However, it should be borne in mind that there is a change in the sample of countries in this figure as more independent countries enter the data set over time.

The green and blue lines show the trend over time for countries that have weak and strong executive constraints respectively. At the very beginning of the sample, there are actually more hereditary leaders in countries with strong executive constraints. However, this pattern is reversed by the end of the nineteenth century and throughout the twentieth century there are fewer hereditary leaders in countries with strong executive constraints.

Finally, we look at some raw facts about growth. Table 2 compares the average growth performance in countries depending on whether the country has an hereditary leader and whether it has strong or weak executive constraints. This suggests a clear pattern with growth being lowest when there is neither an hereditary leader nor strong executive constraints. In this case, the average growth rate is 0.89%. This contrasts with a growth rate of around 2% in all of the other cases. An F-test (F=4.42, p-value 0.03) reveals that we can reject the null hypothesis that the mean growth rates are equal for the sample of hereditary and nonhereditary leaders in countries with weak executive constraints. However, we cannot reject that the average growth rates are the same when we compare countries with strong executive constraints by whether the leader is hereditary or not (F-test (F=0.86, p-value 0.35)).

3 Theory

In this section, we develop a model where hereditary rule emerges as a political equilibrium in the spirit of Olson (1993) and induces better performance from leaders who care that their offspring will follow them in office. However, this is valuable to voters only when executive constraints are weak if such constraints have a direct impact on the quality of policy. This is because we assume that strong executive constraints independently solve the moral hazard problem in government.[7]

Policy Making and Institutions Time is infinite and in each period a policy maker is required to make a binary policy choice $e_t \in \{0, 1\}$ which determines a payoff to the citizens of $\delta_t \in \{0, \Delta\}$. For concrete purposes think of this as making decisions which increase everyone's incomes via enforcement of property rights or improving infrastructure. Each period there is a state

[7] See Besley and Mueller (2015) for a model along these lines.

of the world $s_t \in \{0,1\}$ and $\delta_t = \Delta$ if and only $e_t = s_t$. We assume that both states are equally likely and that generating a benefit of Δ to the citizens costs a leader c. Since generating Δ is costly, there is a potential moral hazard problem.

There is a countably infinite pool of families denoted by $f = 1, ...$ from whom leaders can be drawn. Each leader lives for one period and has a single off-spring. We suppose that there is benefit B to an incumbent of having his offspring hold power. This is like a classic "warm-glow" bequest motive. We assume that $B > c$, i.e. a leader would be willing to generate Δ for the citizens if his offspring is allowed to succeed him.

Each leader, ℓ, has a level of innate "popularity" $a_\ell \in \{-A, A\}$. Any leader is popular with probability ρ. Let $\bar{A}(\rho) = [2\rho - 1] A$ be a randomly selected leader's expected popularity.

We consider two institutional possibilities. With strong executive constraints, we will suppose that $e_t = s_t$ always so that citizens always get $\delta_t = \Delta$.[8] Such constraints therefore entirely eliminate moral hazard. This is, of course, an extreme case but having this happen probabilistically would yield broadly similar results. With weak executive constraints, the incumbent has full discretion over the action e_t. Hence, $e_t = s_t$ only when it is the leader's private interest to do so.

Retention and Selection The retention of leaders lies in the hands of a sub-group of citizens (the selectorate). The term selectorate, coined by de Mesquita et al (2003) could represent a variety of institutional settings. In democracies retention decisions rest voters although party elites and insiders can also play an important role in who stands. In non-democracies the selectorate could comprise senior army officers in military dictatorships or influential aristocrats in monarchies. They could also be members of a party hierarchy as in a communist system like in China. Members of the selectorate decide whether to select the policy maker from the ruling family or to install a new ruling family. An hereditary dynasty is created when the selectorate selects the offspring of the incumbent to take power. We suppose that the selectorate have discount factor β and that they observe the popularity of the leader's offspring before deciding whether to appoint

[8] While this is an extreme case, it serves to make the logic clear – all that matter is that Δ can arise with a positive probability under strong executive constraints regardless of the behavior of the leadership.

her as leader.

Timing The timing of the model with each period t is as follows:

1. There is an incumbent leader in office for $t-1$.
2. Nature determines the popularity of the leader's offspring $a \in \{-A, A\}$.
3. The selectorate chooses between the leader's offspring and picking a new ruling family from the pool.
4. Nature chooses s_t.
5. The incumbent leader chooses $e_t \in \{0, 1\}$
6. Payoffs are realized.

We will look for a stationary sub-game perfect equilibrium of the model where the selectorate and incumbents optimize in their policy and retention decisions.

3.1 Equilibrium

We begin by showing what happens with strong executive constraints. Then we look at weak executive constraints and focus on two possibilities. In the first of these, only popular incumbents are retained and incumbents never produce good policy. In the second, a hereditary dynasty emerges where the leader's offspring is retained whether or not she is popular provided that her predecessor has generated Δ while in office.

Strong Executive Constraints If there are strong executive constraints then $e_t = s_t$ always by assumption. If the selectorate observes that the offspring of the incumbent is popular then she will be appointed as leader since $A > \bar{A}(\rho)$. Thus, consistent with the data, hereditary rule is possible even with strong executive constraints. However, this will happen purely on the basis of popularity rather than performance in office.

Weak Executive Constraints We begin with the following benchmark result where hereditary succession plays no role.

Proposition 1 *There is an equilibrium where only popular incumbents are retained and* $e_t \neq s_t$ *for all* t.

There is no performance related retention in this and it is not worthwhile for the incumbent leader to put in good performance which is costly. As with strong executive constraints, the frequency of incumbent turnover is driven purely by ρ the probability that an incumbent's offspring is popular. Thus, as under strong constraints, it is still possible to have some hereditary leaders in this case, but only based on popularity not in exchange for good performance.

We now consider an hereditary equilibrium in which the offspring of all incumbents are retained regardless of their popularity as long as their predecessor has produced a good policy outcome. We now give conditions for this possibility to emerge.

Proposition 2 *Suppose that* $\Delta \geq 2\rho\left[1-\rho\beta\right]A$ *and* $\left(1-\rho\right)B > c$, *then there is an equilibrium in which the offspring of all incumbents are retained and* $e = s$.

This equilibrium requires that the bequest motive be strong enough and that Δ is large enough to make it worthwhile for the selectorate to ignore any gains from looking for a popular leader. Note that the condition for hereditary rule to be an equilibrium depends on ρ. It is hardest to satisfy when ρ is close to one since it is highly likely that the unpopular offspring of a leader will be replaced by a popular leader is she is no allowed to succeed her parent. Moreover, the leader knows that his offspring will be allowed to succeed him regardless of his policy action.

This equilibrium can be thought of as a relational contract between the dynasty in power and the selectorate along the lines envisaged in the opening quote from Olson (1993). The hereditary dynasty delivers good policy outcomes in exchange for insurance against unpopular members not being allowed to take office. This is supported by the belief that if the hereditary system were to break down (specifically if an unpopular incumbent were removed) then there would be non-hereditary equilibrium where all incumbents perform poorly and only popular offspring of incumbents are retained.

Although we have applied this idea to an hereditary system, this could also be a model of a long-lived party system like the communist party in China where economic growth is "exchanged" for continuity in power regardless of whether leaders are intrinsically popular. This is a focal point of the system which creates political stability and good economic performance. Such systems only make sense in a weak executive constraints setting like China where there are no direct means of enforcing good policy.

Predictions Proposition 2 gives conditions for there to be an equilibrium with good policy without strong executive constraints. Thus citizens get good policy ($e_t = s_t$) in two cases: (i) if there are strong executive constraints and (ii) if there is an hereditary equilibrium under weak executive constraints. There will bad policy outcomes (with $e_t \neq s_t$) for citizens when then is no hereditary equilibrium with weak executive constraints.

Since there can be multiple equilibria, the model does not fully explain how some polities can coordinate on hereditary equilibria. For the core empirical results, we suppose that this coordination is uncorrelated with factors which shape economic performance. The model also does not explain why all polities do not choose to have strong executive constraints, particularly those which cannot organized hereditary equilibria. This could be explained by adding additional features to the model where bad policies generate rents for some agents who therefore have a vested interest in that.

Comments on the Model The model that we have presented is deliberately simple in order to focus on the nature of the exchange between the selectorate and the leaders. It could be complicated in a variety of ways which would make it more realistic while retaining the essence of the argument that we have developed for why hereditary rule can improve performance. For example, the assumption that strong executive constraints always improves performance is not needed, only that it does so on average. We could also introduce an element of selection into the model whereby some leaders are more or less competent with growth providing a signal of competence. If competence is transmitted intergenerationally, this would provide an additional argument for hereditary selection.

The model has focused on hereditary rather than dynastic selection in general. However, similar theoretical forces could also explain how families/clans could developed reputations which would be relevant in periodic

contests for power. This would depend on the selectorate using the history of all past members of a dynasty and factoring this into their decisions and could explain period re-emergence of members of dynasties.[9]

Growth Implications We will apply the ideas above to aggregate measures of economic performance when specific leaders are in power. We will suppose that the realization Δ_t affects productivity so that aggregate output, Y_t, is given by the production function:

$$Y_t = e^{\theta_t} \left[K_t^{1-\alpha} L^{\alpha} \right]$$

where productivity depends on policy: $\theta_t = [1 + \Delta_t] \theta_{t-1}$ and there is a fixed supply of labor, L. We will suppose that aggregate capital $K_t = sY_{t-1}$ where s is the savings propensity. This implies that growth is given by:

$$g_t = \log\left(\frac{Y_t}{L}\right) - \log\left(\frac{Y_{t-1}}{L}\right) = [1 + \Delta_t] \theta_{t-1} - \alpha \log\left(\frac{Y_{t-1}}{L}\right).$$

This forges a link between policy making as it is affected by institutions and behavior, and economic growth.

This very simple model, combined with the discussion of political equilibria give us the following prediction about growth:

Core Growth Prediction *Growth will be higher in an hereditary equilibrium only if executive constraints are weak.*

We will test this idea by looking at economic growth during the spell of leader ℓ in country c who takes office in year t. Specifically, let $g_{c\ell t}$ be the average growth rate during the leader spell. We then run regressions of the form:

$$g_{\ell ct} = \alpha_c + \alpha_t + \lambda y_{\ell ct} + \beta_1 \delta_{\ell ct} + \beta_2 \sigma_{\ell ct} + \beta_3 \left(\delta_{\ell ct} \times \sigma_{\ell ct}\right) + \varepsilon_{\ell ct} \qquad (1)$$

where α_c are country dummies, α_t are dummies for the years in which leaders take office, $y_{\ell ct}$ is the level of income per capita in the year that leader ℓ's spell in office begins, $\delta_{\ell ct}$ is a dummy variable which is equal to one if leader

[9] We find empirically that dynastic leaders seem to emerge following natural disasters suggesting that there are times when there citizens crave familiarity among their leadership.

ℓ is an hereditary leader $\sigma_{\ell ct}$ is a dummy variable which is equal to one if a country has strong executive constraints when the leader comes to power. We cluster the standard errors at the country level.[10]

According to the core prediction of the theory, we should expect $\beta_1 > 0$, $\beta_2 > 0$ and $\beta_3 < 0$ with a core implication of the theory being that $\beta_1 + \beta_3 = 0$, i.e. having a dynastic leader generates better performance only when executive constraints are weak.

This empirical exercise will take variation in institutions as exogenous conditional on year and country fixed effects. Below, we will find that β_2 in equation (1) is not significant in each of our specifications once we include country fixed effects suggesting that fixed country characteristics may be doing a decent job in conditioning out the relevant unobserved heterogeneity associated with institutional differences. Moreover, by including country fixed effects, we are far more cautious than the majority of the previous literature studies on institutions where the main source of identification is purely cross-sectional. That said, what we have here are only correlations that we can compare to the predictions of the theory. Below, we will explore the possibility of getting a source of exogenous variation from the gender composition of the offspring of first-born children to explain successful hereditary transitions in monarchies. We will show that whether the first born is male is correlated with a successful hereditary transition.

4 Evidence

We begin by presenting the core results on growth. We then assess their robustness as well as looking at supporting evidence from policy outcomes. The next step is to look at whether growth affects the probability that countries stick with hereditary leaders. Finally, we look at whether the results hold up when we use the gender composition of the first-born child as an instrument for hereditary succession in monarchies.

Core Results The core results are report in Table 3.

In column (1) we analyze the relationship between growth and having an hereditary leader in office using a basic specification which excludes lagged

[10] This specification is fairly standard for a growth regression in panel data. The long time series (an average of 11 observations, i.e., leaders per country) means that the standard dynamic bias from including lagged income should not be an issue.

income as well as year and country dummies. This shows a positive correlation between the growth rate and having an hereditary leader in office, but only if there are weak institutional constraints. The F-test reported in the seventh row of the table tests the hypothesis that there is no effect on growth from having an hereditary leader when executive constraints are strong, i.e. $\beta_1 + \beta_3 = 0$ in (1). It shows that we cannot reject the hypothesis that there is no positive correlation with growth when an hereditary leader takes office with strong executive constraints. The size of the coefficient suggests that, in a country with weak executive constraints, going from a non-hereditary leader to an hereditary leader, increases the annual average economic growth of the country by 1.03 percentage points per year. This is consistent with what we saw in the raw data presented in Table 2.

In column (2) we allow for convergence by including the log of per capita income in the year before the leader spell starts. The positive correlation between growth and having an hereditary leader in office remains. The implied long-run effect is similar in magnitude to the coefficient in column (1). Our core finding is also found in column (3) where we include year dummy variables to capture global macro-economic shocks and trends. Column (4) adds country dummies which allow us to control for time-invariant country characteristics. The size of the coefficient on being an hereditary leader is now larger and strongly significant. It is interesting to observe that the coefficient on having strong executive constraints is not significant once we include country dummies. This suggests that fixed country characteristics account for much of the variation that determines institutional differences.

In column (5) and (6), we look at separate sub-samples according to the strength of executive constraints. This allows separate year and country dummies to be estimated for each subgroup. The finding is in line with the findings of the previous columns with the only significant correlation being for hereditary leaders.

In column (7), we respond modestly to the concern that the process determining institutional change in our data could be playing a direct role in the results. We have 87 institutional transitions between strong and weak executive constraints in our data. In column (7), we drop all leaders who presided over an institutional change during their tenure along with all those for whom there was an institutional change in their first two years or last two years in power. We want to be sure that this group of 148 leaders are not driving the results since such "reformist" leaders may be different from others in terms of their growth performance. The results in column (7),

which use the same specification as column (4) confirm that this is not the case.

Overall the results indicate that, when there are weak constraints in the executive, hereditary leaders tend to out perform non-hereditary leaders in line with the theory which sees this as part of an implicit relational contract.

Robustness In Table 4, we assess the robustness of these results to a variety of alternative specifications and ways of looking at the data. We first assess whether results in Table 3 are sensitive to the exact measure of hereditary leadership that we use, considering broader and narrower alternatives.

Column (1) focuses only on leaders whose father was head of the state, the most narrow definition of hereditary leadership. The core results hold up in this case. Column (2) uses a less restrictive definition of hereditary leadership, also classifying as hereditary those leaders whose uncle, brother, cousin, spouse, or brother-in-law had been head of the state. The coefficient is somewhat smaller but still positive and significant for the case of weak executive constraints. Column (3) widens the core definition of hereditary leadership in a different way by classifying leaders as hereditary if their parents or grandparents had held *any* political position not just being head of state. Again the core results hold up.

In column (4) of Table 4, we include the age and tenure (in years) of leaders as additional controls. This deals with a possible concern that hereditary leaders are different in other ways which is driving their performance. Moreover, we have already seen from Table 2 that hereditary leaders tend to stay longer in office and tend to be younger when they take up their position. There is a positive and significant correlation between the tenure of a leader and average economic growth during the leader's spell in office. There is no significant correlation with the age at which the leader is selected. The core results reported in Table 3 remain the same with hereditary leaders being associated with higher growth but only with weak executive constraints.

Institutions such as executive constraints could be correlated with other variables which affect economic performance. One powerful and important hypothesis concerns the role of human capital in making democracy sustainable. Indeed, it is sometimes argued that correlations between institutions and performance are suspect when human capital levels are controlled for (Glaeser et al, 2007). Thus it is interesting to explore this in our case.

Due to the difficulty of obtaining reliable education data at the country

level for longer periods of time and a wide range of countries, we now focus on period after 1960. Column (5) in Table 4 establishes that the core results are robust when we focus on the period 1960 onwards although the correlation between growth and having an hereditary leader is somewhat smaller. Column (6) includes the average years of education in the population over age 25 from the Barro and Lee (2001) data set as regressor. The coefficient on education is not significant (principally due to the inclusion of country fixed effects). But the core finding of the paper is the same with growth being higher when an hereditary leader holds office when executive constraints are weak.

Policy Since we are positing that leaders affect growth, we would expect leadership to matter via affecting the policies that are implemented during a leader's spell in power. In Table 5, we explore directly by focusing on some policies that could plausibly be thought to affect growth.

One possibility is that productivity enhancing investment decisions depend on the enforcement of contracts and support for markets. If these are important for growth as argued, for example, by Hall and Jones (1999), we should expect a similar pattern of results when we use this as a dependent variable. To investigate this, we look at the composite index of government anti-diversion policies (GADP) as created from the International Country Risk Guide Date (ICRG) by Hall and Jones (1999) and Knack and Keefer (1995) who use five averages of these variables. We use an equally-weighted average of five variables: law and order, bureaucratic quality, corruption, risk of expropriation, and government repudiation of contracts which is available between 1982 and 1997. We normalize the variable to lie between zero and one with higher values representing more effective policies to support markets.

The specification that we estimate is:

$$GADP_{\ell ct} = \alpha_c + \alpha_t + \beta_1 \delta_{\ell ct} + \beta_2 \sigma_{\ell ct} + \beta_3 \left(\delta_{\ell ct} \times \sigma_{\ell ct}\right) + \varepsilon_{\ell ct} \qquad (2)$$

for leader ℓ in country c beginning at date t, where: α_c are country dummies and α_t are year dummies. To capture the leader's performance, we measure $GADP_{\ell ct}$ in the last year of the leader's time in office.[11] As above, we cluster the standard errors by country.

[11] We chose this criterion so that we do not lose leaders whose spell in office ends after 1995.

The results are reported in Columns (1) and (2) in Table 5. In column (1) we include year and country dummies and in column (2), country dummies are replaced by region dummies. As with the core results, there is a positive correlation between $GADP_{\ell ct}$ and an hereditary leader being in power with weak executive constraints but there is no significant correlation when executive constraints are strong. Hence the pattern found for government anti-diversion policies parallels that found in data on growth.[12]

Our second policy measure also reflects something which arguably has a significant impact on growth, namely infrastructure quality. The most readily available data on this are from the Business Environment Risk Intelligence (BERI) data which are available between 1972 and 1990. Knack and Keefer (1995) shows that a high correlation between an index of these BERI measures and higher investment and growth rates. This infrastructure quality variable that we use specifically tries to capture the quality of available facilities affecting communication and transportation within a country. We also normalize this measure to lie between zero and one.

The specification that we estimate is:

$$IQ_{\ell ct} = \alpha_c + \alpha_t + \beta_1 \delta_{\ell ct} + \beta_2 \sigma_{\ell ct} + \beta_3 \left(\delta_{\ell ct} \times \sigma_{\ell ct}\right) + \varepsilon_{\ell ct} \tag{3}$$

for the spell in office of leader ℓ in country c beginning at date t, where: α_c are country dummies and α_t are year dummies. We measure $IQ_{\ell ct}$, the BERI infrastructure quality variable, during the last year of the leader's spell in office.[13] We continue to cluster the standard errors by country.

The results are reported in columns (3) and (4) of Table 5. In column (3) we show that with country and time dummy variables, there is a positive and significant correlation between having an hereditary leader in office and infrastructure quality, but only when executive constraints are weak. As with growth, we cannot reject the hypothesis that there is no correlation between

[12] We also attempted to update this variable to 2008. However, some of the variables in the original ICRG are no longer reported. However, we can construct something which is fairly close; specifically we take the average of corruption, law and order, quality of bureaucracy and investment profile, normalized to lie between zero and one. Expropriation risk and repudiation of contracts have been replaced in the later data by a new investment profile variable. If we repeat the specifications of columns (1) through (2) of Table 7, the results with country dummies are weak, but with regional dummy variables, the results are similar to those in columns (1) and (2).

[13] We chose this criterion so as not to lose from the sample those leaders whose spell in office ends after 1990.

$IQ_{\ell ct}$ when executive constraints are strong. The findings are broadly similar in column (4) of Table 5 where we only exploit within-region variation.

Does the survival of hereditary leaders depend on growth? We now test one aspect of the mechanism emphasized by the theory, that hereditary succession is dependent on good economic performance.[14] For this purpose, we define a regime in year t, r_t, to be hereditary ($r_t = 1$) if an hereditary leader is in power in t and non-hereditary, ($r_t = 0$) if a non-hereditary leader is in power. We then estimate the probability of an exit from an hereditary regime into a non-heriditary regime.

Specifically, we model this as follows:

$$\text{Prob}\left(r_t = 0 : r_{t-1} = 1\right) = \Phi(\theta_c + \theta_t + \kappa_1 \bar{g}_{ct} + \kappa_2 z_{ct}) \text{ if } r_{t-1} = 1 \qquad (4)$$

where $\Phi\left(.\right)$ is a standard normal distribution function, (θ_c, θ_t) are country and year dummies $\bar{g}_{ct}$ is the average growth rate over the previous five years and z_{ct} are other determinants of hereditary leadership which we outline below. If growth affects the probability of a succession, the coefficient on growth, κ_1, will be negative. It makes sense to study this using annual data since, unlike the theoretical model, there is no fixed date at which a leader's term comes to an end. In effect, this approach is modeling the hazard function associated with being in an hereditary regime and the probability of exiting that regime.

Table 6 presents the results. Column (1) finds a negative association between the survival of the hereditary regime and growth performance. The magnitude of the effect suggests that a 1 percentage point change in growth over the past five years leads to a 2.6 percentage point fall in the probability that any hereditary leader comes to an end in any year. Since the unconditional probability of this happening is around 4.7%, this says that the probability of the hereditary regime coming to an end in any given year

[14] Our model does not predict when this might come to an end even if a country is in the hereditary equilibrium of Proposition 2. However, it would be difficult to modify the theory to have this possibility. One device would be to invoke some kind of "trembling hand" in equilibrium play with some leaders failing to deliver to choose good policies even when it is in their interest to do so. Another possibility would to invoke competence shocks which impair the ability of some hereditary leader's to deliver. In such cases, there will be low growth according to our model and hereditary leaders will not succeed in passing on the office to their offspring.

increases by 50% when growth falls by 1 percentage point. Column (2) confirms that this finding is driven by countries that have weak executive constraints – we cannot reject that there is no relationship between the end of a hereditary regime and poor performance for countries with strong constraints. The size of the effect is marginally larger with a 2% increase in growth associated with a 4.4% reduction in the probability of a hereditary regimen ending.

These results give credence to the idea that there could be a performance related component to the survival of hereditary regimes where executive constraints are weak in line with what the theory postulates.

Hereditary Succession in Monarchies Our model of hereditary leadership has multiple equilibria. Hence whether an hereditary leader emerges with weak executive constraints is an equilibrium selection issue. In this world social conventions can play a coordinating role and in some monarchies a common convention is primogeniture where the oldest son is the presumptive heir. If this system is in operation, then monarchs who have a first born son may be more likely to be selected as the next leader. Moreover, if the heir already has a son himself at the time that they become king, then it further increases the likelihood of continuity through time.

To look at this empirically, we collected data on the gender composition of as many of our leaders as possible from a range of sources: *Encyclopedia of Heads of States and Governments, Oxford Political Biography: Who is Who in the Twentieth Century World Politics, Encyclopedia Britannica*, as well as other online sources, and biographies contained in *Lexis-Nexis*. This gives us information on only a sub-set of our leaders. The data is particularly complete for monarchies since having children tends to be important for succession. We define an hereditary leader to be a monarch in our data if, according to their biography, he/she is a member of a recognized royal family in the country. For example, members of the Alaouite dynasty which started in 1631 in Morocco are monarchs as are members of the Rana dynasty in Nepal. Since almost all monarchies have weak executive constraints, we focus exclusively on this case in this section.[15] This yields a sample of 492 leader spells from 114 countries where 22 have monarchies.

Having a son per se is not, however, a source of exogenous variation since a system that favored boys might lead a monarch choosing to have

[15]Monarchs with strong executive constraints are extremely rare in out data.

more children in the hope of having a boy, in order to enhance the chance of an hereditary succession. However, whether a monarch has a boy or a girl as their first born should be random. We use this data to isolate a causal effect of monarchy on country economic performance which parallels the approach taken in the literature on the succession of CEOs in family firms. For example, Bennedsen et al (2007) exploits the gender composition of the first born child as an instrument for family succession in a firm.[16] In many ways, monarchies and family firms are quite similar in having to deal with succession planning.

The proportion of leaders in our sample who have a first-born son is 52.4%. However, consistent with the idea that this influences selection, 64.0% of monarchs have a first-born son. On average 50.8% of leaders have a predecessor with a first-born son while this proportion among monarchs is 59.6%. Thus monarchs with first-born sons and/or predecessors who have first-born sons are over-represented in monarchies compared to non-monarchies. This suggests that male lineage succession is more important in monarchies than other systems of leadership.[17]

We now explore whether our results on growth hold up once we instrument for succession using a variable based on whether monarchs have first born sons. Our core variable is a dummy which is equal to one if a monarch *and* his predecessor had a first-born son. The reason that we include the predecessor is that a monarch often comes to power after he has had a child which could also influence selection since the future male line of succession is then enhanced. The question is then whether having monarch is correlated with better growth and whether this holds up to instrumenting this with our core first-born son variable.

The results are reported in Table 7. As in the core specification, we include country and time dummies as well as a control for the level of GDP per capita. Column (1) Table 7 confirms that in this sub-sample we do have a positive effect of being a monarch on growth although the size of the effect is somewhat smaller than in the core results.

Column (2) gives the "first-stage" regression where we show that there

[16] We are grateful to Fred Finan for drawing our attention to this.

[17] We will focus on leaders who take office after the age of 25 when it is more likely that they will have started a family, making whether they have a first born-son most relevant for succession. We have also looked at whether morachies with a first-born girl end up having more children. However, we do not find that the number of children that a monarch has depends siginifiacntly on the gender of the first-born child.

is a positive relationship between having a first-born son and hereditary succession of a monarch. Column (3) now gives a "reduced form" where the outcome is growth. The result shows that growth is positively correlated with the first-born son dummy as we would expect if this influencing the likelihood of succession. Finally, column (4) presents an IV specification where the first-born son variable is used as instrument for succession in monarchies. Here, we find a positive effect of monarchy on growth which is significant at a 10% level.[18]

Finally, column (5) broadens the sample to include all leaders for which we have data on first-born sons. We now include countries with both weak and strong executive constraints and interact our first-born son dummy with strong executive constraints. If this is influencing the chances of succession then our theory says that there should be a positive correlation with growth but only where executive constraints are weak. This is exactly what we find in column (5) of Table 7.

5 Concluding Comments

This paper has looked at the role of hereditary rule in improving economic performance when other controls – executive constrains – on incumbents are absent. The logic that we have exploited is essential that conjectured in Olson (1993) that hereditary rule is a way of creating better inter-temporal incentives. To test this idea, we collected information which allows us to classify rulers as hereditary. In line with the theory, hereditary rule increases growth but only when executive constraints are weak.

The analysis contributes to our understanding of the heterogeneity of arrangements which can sustain economic policy. Establishing hereditary succession is generally part of the informal institutional arrangements relying on norms and conventions as much as formal constitutional rules. It is important to drill down into such details when looking at the workings of political systems and how they relate to economic performance.

Although we have tried to understand the logic of hereditary rule, we do not regard the findings of the paper as supporting the institutions of

[18] One way of assessing the exclusion restriction implicit in this IV formulation is to see whether the gender of the first-born is correlated with economic growth and gdp per capita for those with first born sons and first born daughters. When we do this, we find no significant differences across the two samples.

hereditary rule. There are many arguments against, going back at least to Paine (1776), about the inherent injustice in such systems. Moreover, the fact that many polities around the world have put an end to hereditary rule and establish strong executive constraints is no accident since this is arguably a much more robust way to control leaders than relying on the chance that succession incentives will safe-guard the public interest.

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Appendix

Proof of Proposition 1:. Consider the first case and suppose that $\hat{e}(s) \neq s$, and all unpopular leaders are removed from office after one period. The value to the selectorate along the equilibrium path is $\frac{\rho A+(1-\rho)\bar{A}(\rho)+\Delta}{1-\beta}$. Let

$$W(x) = x + \beta\left[\frac{\rho A + (1-\rho)\bar{A}(\rho) + \Delta}{1-\beta}\right].$$

Retaining popular incumbent yields $W(A)$. Deviating by removing such an incumbent makes the selectorate worse off since $W(A) > W\left(\bar{A}(\rho)\right)$. Now consider whether there could be a worthwhile deviation by retaining an unpopular incumbent rather than picking a new incumbent at random. This will not be the case either since $W(-A) < W\left(\bar{A}(\rho)\right)$. Hence there is no worthwhile one-shot deviation for the selectorate. Since the probability that an incumbent is retained is independent of δ, it is optimal for all incumbents to set $e \neq s$ for all $c > 0$. ■

Proof of Proposition 2:. We first show that it is optimal for the selectorate in such cases to retain the offspring of leaders in this case if they produce Δ when the out of equilibrium beliefs are that if the leader choose $e \neq s$, then there is an infinite reversion to playing the benchmark equilibrium where $e \neq s$ for all leaders and only popular leaders are retained. In the benchmark equilibrium, the payoff along the equilibrium is

$$\frac{\rho A + (1-\rho)\bar{A}(\rho)}{1-\beta}.$$

In the proposed hereditary equilibrium, the payoff is:

$$\frac{\bar{A}(\rho) + \Delta}{1-\beta}.$$

Suppose now that the incumbent leader has an unpopular offspring then retaining that individual is optimal if

$$-A + \Delta + \beta\left[\frac{\bar{A}(\rho) + \Delta}{1-\beta}\right] \geq \bar{A}(\rho) + \beta\left[\frac{\rho A + (1-\rho)\bar{A}(\rho)}{1-\beta}\right]$$

which reduces to the condition above. Clearly, if this condition holds, it will hold a fortiori if the incumbent's offspring is popular. This equilibrium exists as long as $(1-\rho)B \geq c$. This is because if the incumbent deviates to $e \neq s$, then his incumbent will be retained in office with probability ρ. However, if he chooses $e = s$, then his offspring will hold office for sure. ■

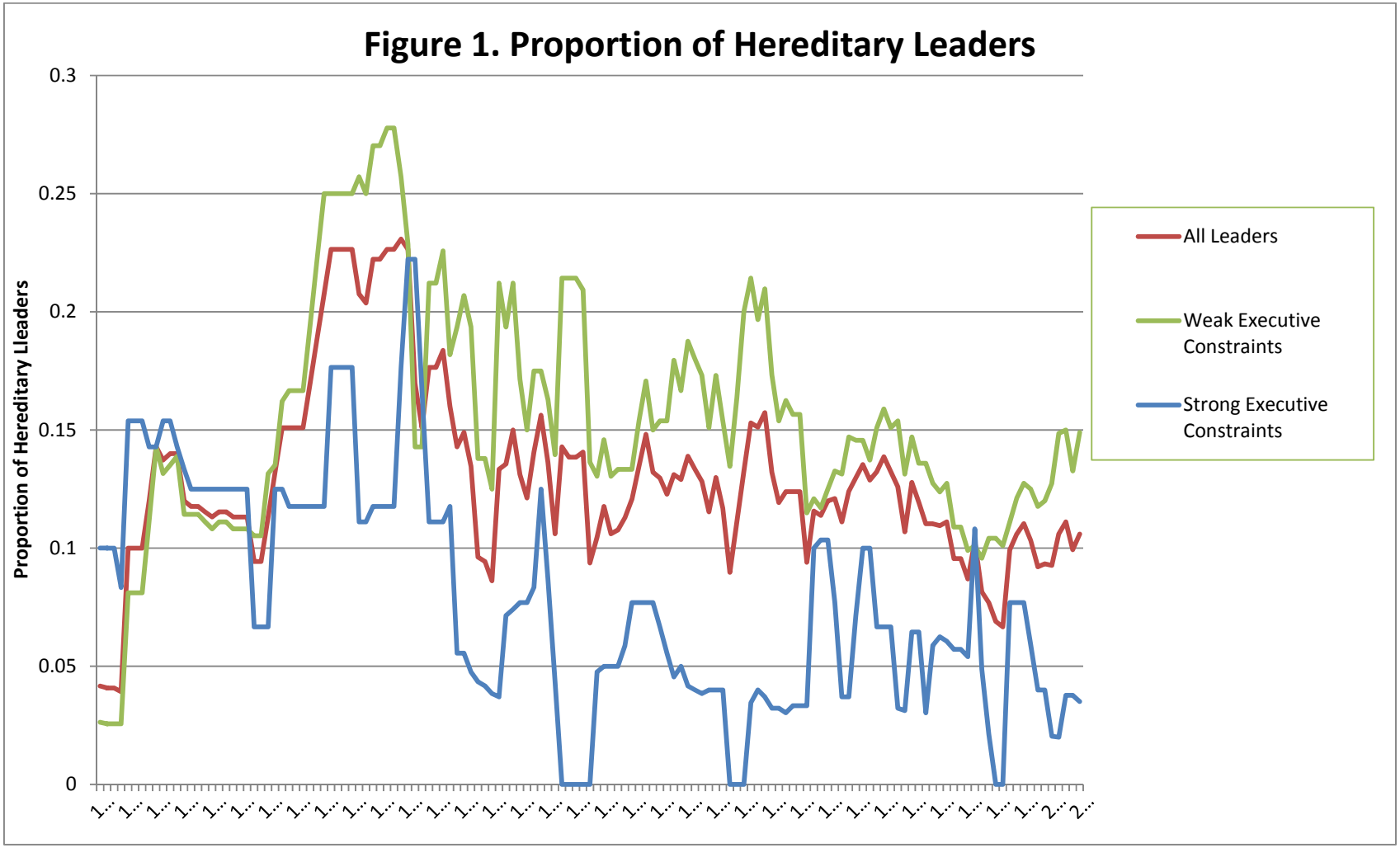
Figure 1. Proportion of Hereditary Leaders
Proportion of Hereditary Lleaders
0.3
0.25
0.2
0.15
0.1
0.05
0
All Leaders
Weak Executive Constraints
Strong Executive Constraints

Table 1: Leader Characteristics

	Hereditary leader	Non- hereditary leader	Hereditary leader with weak executive constraints	Non- hereditary leader with weak executive constraints	Hereditary leader with strong executive constraints	Non- Hereditary leader with strong executive constraints
Education (graduate)	0.20	0.28	0.17	0.23	0.30	0.38
Education (college)	0.47	0.73	0.45	0.67	0.65	0.83
Studied abroad	0.32	0.25	0.27	0.26	0.43	0.20
Age in first year holding office	42	53	42.3	51.52	44.88	55.??
Length of Tenure	11.5	4.8	11.7	5.7	7.21	3.35
Served in Military	0.016	0.22	0.024	0.34	0	0.06
Elected/selected under democracy	0.35	0.58	0.19	0.31	1	0.99
Monarch	0.61	0.02	0.66	0.03	0.36	0
Career as Lawyer	0.04	0.26	0.012	0.21	0.12	0.32
Career as Professor and/or scientist	0.008	0.12	0	0.11	0	0.12
Career in Business	0.016	0.05	0.024	0.04	0	0.08

Notes: A leader is dynastic leader if a leader's father, gradfather or mother held an elected position. Education (graduate) is a dummy that is equal to one if the leader has a graduate degree; Education (college) is a dummy that is equal to one if the leader has a college degree; Studied abroad is a dummy equal to 1 if the leader studied abroad; Served in Military is a dummy equal to 1 if the leader was a military professional before holding office; Monarch is a dummy equal to 1 if the leader is a monarch. Career as Lawyer is a dummy equal to 1 if the leader was a lawyer before holding office. Career as a Professor and/or Scientist is a dummy that is equal to 1 if the leader was a Professor or Scientist before holding office. Career in business is a dummy that is equal to 1 if the leader was in business before holding office.

Table 2: Mean Differences in Growth

	Weak Executive Constraints	Strong Executive Constraints
Non-hereditary leader	0.89	1.94
	(0.17)	(0.16)
Hereditary dynasty	1.92	1.50
	(0.56)	(0.90)

Notes: The value shows the average growth performance of countries depending on whether the country has an hereditary leader and whether it has strong or weak executive constraints (defined by xconst being equal to 7 in the Polity IV data base). A leader is classified as hereditary if his/her father, gradfather or mother was leader.

Table 3: Core Results

VARIABLES	(1)	(2)	(3)	(4)	Weak Executive Constraints (5)	Strong Executive Constraints (6)	(7)
Hereditary Leader	1.025**	0.853**	0.966**	1.758***	1.985**	-0.304	1.985***
	(0.432)	(0.413)	(0.488)	(0.569)	(0.760)	(0.566)	(0.637)
Log(GDP) lagged		-0.142	-0.133	-2.881***	-2.950***	-4.459***	-3.528***
		(0.135)	(0.158)	(0.604)	(1.081)	(1.071)	(0.615)
Strong Executive Constraints	1.053***	1.247***	1.529***	0.651			0.606
	(0.264)	(0.315)	(0.322)	(0.470)			(0.535)
Interaction	-1.471**	-1.285**	-1.582**	-2.057**			-2.237**
	(0.592)	(0.600)	(0.655)	(0.926)			(1.120)
Year FE			Yes	Yes	Yes	Yes	Yes
Country FE				Yes	Yes	Yes	Yes
Observations	1,681	1,637	1,637	1,637	774	863	1,471
R-squared	0.012	0.014	0.220	0.351	0.448	0.435	0.377
F-test	0.965	0.801	1.464	0.147			0.0752
Prob>F	0.328	0.372	0.228	0.702			0.784

Notes: The outcome measure is the average growth rate during a leader's spell in office. All specifications include country and year fixed-effects. Robust standard errors (clustered at the country level) in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 4: Robustness

	(1)	(2)	(3)	(4)	(5)	(6)
Specification	Father only	Any relative	Father/grandfather held any position	With tenure and age	Post 1960	Post 1960 with education as a control
Hereditary Leader	1.836***	1.398**	1.744***	1.538***	0.949**	0.917*
	(0.582)	(0.563)	(0.576)	(0.571)	(0.479)	(0.486)
Strong Executive Constraints	0.653	0.667	0.635	0.667	-0.154	-0.167
	(0.470)	(0.468)	(0.471)	(0.466)	(0.524)	(0.520)
Interaction	-2.095**	-1.933**	-1.415**	-1.951**	-1.782**	-1.733**
	(0.966)	(0.923)	(0.714)	(0.925)	(0.693)	(0.700)
Lgdpcapl	-2.880***	-2.859***	-2.846***	-2.871***	-2.314**	-2.632***
	(0.603)	(0.597)	(0.595)	(0.614)	(1.013)	(0.982)
Tenure (years)				0.056**		
				(0.027)		
Age (years)				-0.011		
				(0.017)		
Average years of education						0.254
						(0.231)
Observations	1,637	1,637	1,637	1,634	753	753
R-squared	0.352	0.351	0.352	0.351	0.424	0.426
F-test	0.0989	0.501	0.418	0.268	3.268	3.143
Prob>F	0.754	0.480	0.519	0.605	0.0733	0.0789

Notes: The outcome measure is the average growth rate during a leader's spell in office. All specifications include country and year fixed-effects. Robust standard errors (clustered at the country level) in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 5 Government Anti-Diversion Policy and Infrastructure Quality

VARIABLES	(1)	(2)	(3)	(4)
Hereditary Leader	0.131**	0.107***	0.047**	0.086*
	(0.062)	(0.039)	(0.021)	(0.044)
Strong Executive Constraints	0.048*	0.162***	-0.007	0.206***
	(0.027)	(0.031)	(0.019)	(0.039)
Interaction	-0.186**	-0.212***	-0.033	-0.164**
	(0.086)	(0.074)	(0.035)	(0.072)
Country dummies	Yes		Yes	
Región dummies		Yes		Yes
Observations	355	355	274	274
R-squared	0.934	0.596	0.954	0.552
F-test	1.058	2.889	0.286	2.173
Prob>F	0.306	0.0919	0.595	0.146

Notes: All specifications include year fixed-effects. Robust standard errors (clustered at the country level) in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table 6: The end of dynasties

	End of Dynasty	End of Dynasty
VARIABLES	(1)	(2)
Average growth rate in last 5 years	-20.599***	-20.575***
	(5.925)	(7.906)
Strong executive constraints		-0.035
		(0.589)
Interaction		12.808
		(9.076)
Chi square		1.69
P value		(0.1936)
Observations	470	409

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 7: first stage reduce form and IV results

	Growth	Monarch First stage	Growth Reduced-form	Growth IV	Growth Reduced form
VARIABLES	(1)	(2)	(3)	(4)	(5)
Strong executive constraints					0.013**
					(0.006)
Initial GDP per capita	-0.030**	-0.054	-0.031**	-0.015	-0.023***
	(0.014)	(0.043)	(0.014)	(0.016)	(0.008)
First born son dummy		0.045*	0.013**		0.010*
		(0.027)	(0.006)		(0.005)
Interaction					-0.020***
					(0.007)
Monarch	0.052**			0.295*	
	(0.024)			(0.176)	
Observations	492	492	492	492	1,059
R-squared	0.552	0.883	0.553	0.354	0.400
F-test					6.554
Prob>F					0.0115

Notes: All specifications include country and year fixed-effects. Robust standard errors (clustered at the country level) in parentheses *** p<0.01, ** p<0.05, * p<0.1. The first born son dummy is equal to one if the monarch and his predecessor had a first-born son. The first four columns include only countries with weak executive constraints.