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Resilient Leaders and Institutional Reform: Theory and Evidence*

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Abstract

Strengthening executive constraints is one of the key means of improving political governance. This paper argues that resilient leaders who face a lower probability of being replaced are less likely to reform institutions in the direction of constraining executive power. We test this idea empirically using data on leaders since 1875 using two proxies of resilience: whether a leader survives to die in office and whether recent natural disasters occur during the leader's tenure. We show that both are associated with lower rates of leader turnover and a lower probability of a transition to strong executive constraints. This effect is robust across a wide range of specifications. Moreover, in line with the theory, it is specific to strengthening executive constraints rather than generalized political reform.

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1 Introduction

Creating stable systems of government where citizens enjoy political rights and rulers are constrained has been a major achievement in human history. Figure 1 gives a birds' eye view of this achievement by plotting the worldwide prevalence of strong executive constraints, which circumscribe the power of leaders in office, using data from Polity IV.[1] The red line illustrates this evolution across the 50 countries for which we have uninterrupted data from 1875 to 2004. The main variations broadly follow Huntington's three waves of democratization (Huntington, 1991). They reflect reforms in Europe at the beginning of the past century, a setback in the interwar period, followed by a return of high constraints after World War II, and then a surge of institutional reforms in Latin America and the former Communist block from the 1980s onward. The blue line shows the prevalence for *all* countries with available data.[2] Although the proportion of countries with strong executive constraints is considerably lower at the end of the sample in this larger group, the pattern looks broadly similar, with the exception of an additional dip from 1960 to 1975 driven by a number of newly established countries (mainly former colonies).

The reasons for the adoption of such constraints are not well understood. However, leaders who are secure in their hold on power will typically have weak motives to pursue reforms that limit their discretionary authority. This pattern has indeed been common among monarchs and autocrats with few or no formal checks on their power. In one of the most famous historical examples, King John felt compelled to sign Magna Carta in 1215, but only when his power was threatened by the barons on whom he relied for support. This episode suggests a more general and compelling argument: leaders with strong survival prospects are less likely to accept reforms which constrain executive authority. We refer to such leaders as having high *resilience*.

Against this background, our paper studies how resilient leaders may constitute a barrier to reform towards strong executive constraints theoretically and empirically. We formulate a simple model, which predicts that *leader* resilience reduces the incentive to adopt strong executive constraints by reducing the prospect that a ruling *group* loses office.[3] This component from the theory receives support from a first pass at the data. Raw leadership turnover is positively correlated with the adoption of stronger executive constraints. Conditional on country and year fixed effects, such reforms are about 9 percentage points more likely in the five years after a leadership transition than in the five years before the transition, a difference which is statistically significant. But more satisfactory evidence for our general idea requires more exogenous measures of leader resilience.

What makes political leaders resilient? Understanding this in detail would require a host of detailed case-by-case investigations based on political biographies and country-specific analyses. In Section 2, we present three such case studies. More generally, a key property of a resilient leader that may shape his/her propensity for reform is his/her prospective political longevity. Such resilience could be rooted in hard-to-measure individual characteristics, such as robust health, charisma, having the right connections or a ruthless willingness to eliminate political opponents. But resilience could also be the result of matching, i.e., the leader has the right characteristics needed to meet the salient policy challenges in a particular country and time. Thus, a leader who has guided a country through difficult times – e.g., when a natural disaster has struck – may be viewed favorably by the citizens.

But resilience is notoriously hard to predict. Having led the country through the Falklands

[1] The precise data and measure underlying the figure is discussed in Section 4.1.

[2] This lessens the possibility of "survivorship" bias, i.e. looking only at countries that have been around for long time.

[3] This argument applies specifically to this aspect of institutional reform rather than to the change in overall democracy score which typically includes openness of access to power.

war, even the longest serving British prime minister of the twentieth century, Margaret Thatcher, was removed from office by her own party after large public opposition over the new Community Charge (poll tax). Having led Zimbabwe's independence movement, Robert Mugabe has survived as a leader and seems destined to die in office. Mugabe's political cunning and ruthlessness in repressing the opposition has made his position apparently unassailable. However, in an almost similar position, the deteriorating health of Cuba's revolutionary leader, Fidel Castro, forced him to hand over power to his brother Raul.

Given the idiosyncratic nature of resilience, a systematic quantitative analysis can at best look for observable determinants that are plausible correlates of realized tenure. Our strategy in this paper thus builds on two different measures of leader resilience. The first measure relies on observing which leaders die in office by natural causes. Arguably, leaders who hold on to power until they die are inherently more resilient in the sense of our main idea. Moreover, we show that the tenure of such leaders is much longer than for other leaders – in our full sample, they stay in office four years longer.[4] Institutional reform when a resilient leader leaves office then reflects the difficulty an incumbent elite group may have in finding an equally resilient successor, a difficulty that reduces the group's probability of remaining in power.

Our second resilience measure is based on events during the leader's tenure. It is motivated by the famous "rally-around-the-flag effect", which is often associated with wars and domestic emergencies. Famous examples in recent history include how Margaret Thatcher turned around extremely negative polling figures when she resisted Argentina's invasion of the Falkland Islands, and how George W. Bush gained popularity following the 9/11 attacks. Arguably, natural disasters provide more generic, measurable and empirically robust examples of this effect, as they cannot be manipulated in the same way as foreign conflicts. Indeed, a key finding of the paper is that natural disasters are robustly negatively correlated with political turnover. That is, leaders in office after such events tend to survive longer: in our interpretation they become more resilient in the wake of natural disasters.

Our paper speaks to debates about the link between democracy and development. Early studies were influenced by the modernization hypothesis of Lipset (1959), with more recent incarnations being Przeworski et al (2000) and Bueno de Mesquita et al (2003). However, the hypothesis that income drives democracy receives weak empirical support with, at best, ambiguous evidence – see, for example, Barro (1999), Acemoglu et al (2008), and Bruckner and Ciccione (2011). This finding is consistent with our approach. The timing of political change is often idiosyncratic and linked to political circumstance rather than to slow moving variables like income or education, even though these variables may shape the wider context and citizens' aspirations.

By focusing on characteristics of leaders, our approach is distinct from a strand of literature on how social and cultural factors may promote democracy. This includes the ideas that having a strong and effective middle class or plentiful social capital may be important, as hypothesized, for example, by Almond and Verba (1963), Moore (1966), and Putnam (1993). In this general vein, Persson and Tabellini (2009) introduce the concept of democratic capital and find empirically that this consolidates rather than promotes transitions into democracy.

The ambition of our paper is to study a specific dimension of political reform. Although we focus on strengthening executive constraints, our strategic approach to reform has much in common with the literature on franchise extension, particularly the work by Acemoglu and Robinson (2000, 2006) – on top of theory, they also offer useful case-study evidence. Like us, they emphasize the role of political instability, particularly the threat of a revolution. Franchise extension is used

[4]Using this source of variation to study outcomes follows Jones and Olken (2005), but the interpretation is different. In this paper, leaders who die in office are viewed as having a specific trait – resilience – consistent with their longer average tenure. It is not their death per se that matters, but the fact that the new leader (or the leader previous to the one dying in office) may not be equally resilient.

a commitment device by the elite to guarantee more favorable treatment of the masses. Aidt and Jensen (2010) find econometric evidence in support of this view. Below, we show that our two resilience measures do not predict changes in the franchise, nor other moves towards greater openness.

Our argument is also related to that in Lizzeri and Persico (2004), where a ruling group voluntarily extends the franchise to reorient spending from transfers targeted to small groups to broad-based programs. It also resembles a classic argument first made by Rokkan (1970) and extended by Boix (1999). This holds that fears of electoral losses explain the move from plurality to proportional representation as a means of protecting the center-right from a labor electoral landslide in those countries in early 20th-century Europe where landed and industrial elites had not forged their interests.

In a different vein, Lagunoff (2001) develops a model with a dynamic game between two groups, in which greater political turnover leads to greater constitutional support for civil liberties. Congleton (2007) discusses forces that promote the introduction of parliamentary oversight on royal power, focusing on instability due to preference shocks to the monarch. Acemoglu, Robinson and Torvik (2011) develop a model of endogenous checks and balances, stressing the way that these change the ability of special interests to influence policy. Jones and Olken (2009) exploit the difference between successful and unsuccessful assassination attempts to show that random leadership change leads to democratic reform, as measured by a broad democracy index.

In summary, our approach is one where institutional reform is "defensive" and undertaken by a leader or his group in the anticipation of losing political power. This is different from the Acemoglu-Robinson approach, where institutional reforms are also defensive, but the incumbent group gives up political power in order to secure economic power. Our approach also differs from those based on revolutionary change, where institutional change is "offensive" and an incumbent is removed from power as a means of securing political change. Of course, all these approaches have their counterparts in the real world. Our aim is to explore the theoretical and empirical validity of one particular approach, rather than trying to provide a general account of all aspects of institutional change.

In the next section of the paper, we set the stage by discussing three case-studies, for Spain, Nigeria and Taiwan. These cases illustrate how political reforms were first resisted by resilient leaders but implemented once the resilient leaders had left office. They also discuss the sources of power that made each leader resilient during his lifetime.

Section 3 develops a simple infinite-horizon model, where an incumbent group that faces high expected turnover may choose to reform by putting in place more binding executive constraints. Given that leaders have different survival probabilities, the model makes a specific empirical prediction: leaders with greater resilience – and hence lower expected turnover – are less likely to carry out reforms towards stronger executive constraints.

In Section 4, we discuss how to take the model to the data. The model suggests a reduced-form relation, where the probability of a transitions to/from weak executive constraints depends on leader resilience. As already mentioned, we measure resilience in two ways: whether a leader (eventually) dies in office from natural causes, and whether s/he experiences a natural disaster while in office. Underlying this reduced form, are two equations: one representing the impact of resilience on turnover and the other relating institutional change to turnover. We explore both correlations in the data.

Section 5 presents the empirical results. Our baseline estimates are consistent with the predictions of the model. They suggest that having a leader who later dies in office and/or has experienced a natural disaster in the last two years in office lowers the probability of a transition from weak to strong executive constraints by about 3-5 percentage points per year. While we see

similar reductions in turnover with more resilient leaders in countries which already have strong executive constraints, there is no systematic relation of the kind implied by the theory between lower turnover and switches towards weak executive constraints. Our main finding is thus asymmetric. We show that these results are robust to a number of concerns – e.g., the results hold up when we control for personal characteristics of leaders, as well as the economic and political contexts at the time the leader entered into office.

Section 6 relates this paper to wider forms of democratic reform, specifically increases in openness – like extensions of the franchise – that create more contestable power structures. We show how the model can be extend to encompass this aspect of reform. But, empirically, leader resilience does not seem to predict reforms towards greater openness. Thus, our results are specific to reforms of executive constraints and not driven by general democratizations.

Section 7 concludes the paper. Some details of the theory and the data are relegated to an Appendix.

2 Country Case Studies

Francisco Franco in Spain[5] Francisco Franco was an archetypal example of a resilient leader in terms of our theory. A victorious war hero, he ruled Spain under unchecked authoritarian rule after the end of the civil war. According to the Law of Succession from 1947, Spain would return to monarchy, but Franco would rule for life and himself appoint the next King. The unelected Spanish pseudo-parliament, the Cortes, was at best an advisory body with no right to initiate legislation or oppose the government. It was dominated by the so-called National Movement – the Movimiento – which constituted the political elite. The Movimiento comprised a collection of right-wing families and was the only recognized forum for political participation. No elections were held during the Franco period.

Some modest reforms in 1966 separated the functions of head of state and head of government, but the authoritarian character of the regime remained intact. Hard-line Admiral Luis Carrero Blanco was appointed the first prime minister and was also widely expected to become Franco's successor, even though Franco had appointed Juan Carlos as the next head of state already in 1969. Juan Carlos, the son of Spain's legitimate monarch Juan of Bourbon, was generally considered an insider of the ruling elite, by which he had been educated and groomed. As a quid pro quo for the appointment, Juan Carlos swore to be faithful to the National Movement. Thus, he publicly supported the regime and took part in ceremonial functions together with Franco.

From the late 1960s, the regime saw increasing challenges from an emerging political opposition, including regional-autonomy movements in the Basque country, Catalonia, and (less so) Galicia. In particular, ETA – the Basque revolutionary liberation army – started to systematically implement the theory of action/terror/action to further its independence cause. Most significantly, ETA assassinated Carrero Blanco in December 1973. The regime countered the opposition with higher levels of repression. Meanwhile, the ailing Franco replaced Carrero Blanco as Prime Minister with another hardliner, Arias Navarro. Despite the mounting opposition, there was little to suggest an end to the unchecked authoritarian regime. For the postwar period until the year of 1974, Polity IV sets the executive constraints variable for Spain at the bottom score of 1 (on a scale from 1 to 7).

In November of 1975, Franco died in office of heart disease. At this time, no similarly resilient leader was waiting to take over. Although the Cortes proclaimed Juan Carlos King of Spain, it reaffirmed Navarro as prime minister. The latter made vague proposals of limited reforms.

[5]This subsection is based on Conversi (2002), Encyclopedia Brittanica (2012), Fishman (1990), Linz (1990), Linz and Stepan (1996), Polity IV (2012), Rosenfeld (1997), Share (1987), and Solsten and Meditz (1988).

When these were met with public demonstrations, strikes and increased regional terrorist acts, the regime responded with increased repression. Following discontent with Navarro's handling of the situation, the King asked for him to step down in the summer of 1976. He replaced Navarro with another leading figure from the Movimiento, its general secretary and former Franco minister, Adolfo Suarez Gonzales.

Despite expectations to the contrary, Suarez – with outright support of the King – saw the need for more far-reaching reforms, to avoid descent into a spiral of repression and violence. He soon announced plans for a comprehensive package of political reform, which would put in place a constitutional monarchy based on parliamentary democracy with a bicameral legislature. In the fall of 1976, he managed to convince the Movimiento members of the Cortes that the only way forward was to accept this reform package, which effectively would dismantle the institution itself. Later in that fall, the Spanish people approved the plans with a majority of 88% in a national referendum. New laws permitting political parties, including the Communist Party, were passed by the Cortes in the spring of 1977, and a new legislature was elected by proportional representation in the summer of the same year.

In these elections, Suarez ran as the party leader of the newly founded UCD at the conservative-center of politics, which emerged as the largest party followed by the PSOE (the Socialist Party). The most polarized parties, the Alianza Popular (on the far right, picking up the heritage from the dissolved Movimiento) and the Communist Party, each polled at about 10%. The new parliament elected a seven-member constitutional committee representing all major parties to draft Spain's new constitution. The committee's proposal was amended and eventually passed by parliament in October 1978, and approved in a general referendum in December of the same year. After this, Suarez dissolved the parliament and called for new elections under the new constitution.

A mere three years after Franco's death, Suarez and Juan Carlos, two members of the former ruling elite, had thus led the country through a remarkably peaceful democratic transition. In this process, Spain adopted a constitution with a number of horizontal checks and balances, as well as provisions for regional autonomy. The new political regime has endured since those days – its resilience was tested most dramatically in a failed coup attempt in February 1981 by Colonel Antonio Tejero, who together with 200 armed members of the paramilitary police (the Guardia Civil) stormed into the Chamber of Deputies to interrupt its election of the new prime minister. From the year of 1978, Polity IV codes Spain's executive constraints with the top score of 7 (on the 1 to 7 scale).

This example illustrates two key points relevant to the paper. First, Franco faced no effective opposition while alive – the fact that he died in office is indicative of his resilience as a leader. Second, following his departure, no comparable resilient leader was waiting in the wings. The fact that subsequent leaders of the ruling group were likely to face a more contestable position led to a move towards stronger executive constraints.

Chiang Kai-shek and Chiang Ching-kuo in Taiwan[6] Chiang Kai-shek and his son Chiang Ching-kuo are also examples of resilient leaders whose hold on power limited their desire for strong executive constraints. The historical context is important in understanding their resilience as leaders.

Sun Yat-sen, founder of the Koumintang (KMT), led Taiwan after its retreat from mainland China to Taiwan in 1949. The KMT government had brought with it not only a large number of immigrants and a large bureaucracy, but also the official constitution of the Republic of China. Based on the political ideas of Sun Yat-sen, it had been put in place in 1946 as a compromise with

[6]This section is based on Constitution Writing and Conflict Resolution (1999), Dagne (2002), Encyclopedia Brittanica (2012), Polity IV Country Reports (2010), USAID (2006), and US State Department (2011)

the Communist Party. The constitution prescribed a peculiar form of parliamentary government encompassing an intricate system of checks and controls, where members of the National Assembly and the legislature (Legislative Yuan) with their, de jure, extensive powers were all to be elected in mainland China. The original mainland members of these two bodies came to hold lifelong tenure, guaranteeing the continued dominance of the KMT. As the mainlanders began to die off, however, the government began to hold occasional supplemental elections in which a few islanders were elected.

De facto, however, large parts of the constitution were suspended as a result of the "Temporary Provisions for the Duration of Mobilization to Crush the Communist Rebellion", adopted in 1948. These provisions together with the martial law proclaimed in 1949 gave extensive powers to the president and his government. Chiang Kai-shek resumed the presidency in 1950 which he maintained until his death in 1978. Martial law was to remain in force for 38 years. During this time, Taiwan was effectively ruled by a resilient leader, namely a very powerful president and government – with support of the old KMT elite from the mainland and of the military. Executive constraints are coded as 2 or 3 (out of 7) in the Polity IV data set. While Chiang Kai-shek's death might have led to a less resilient leader taking over, the office passed to his son Chiang Ching-kuo, who was a natural successor and had previously served as minister of defence as well as prime minister. Chiang Ching-kuo inherited much of the informal authority that his father enjoyed and there is, therefore, every reason to regard him also as a resilient leader.[7]

In January 1988, Chiang Ching-kuo died in office due to heart failure and hemmoraghe. His presidential powers and chairmanship of the KMT were assumed by his protegee, Vice-President Lee Teng-hui who arguably had a much less informal authority compared to his two predecessors and hence was less resilient as a leader. As he assumed power, Lee – who, unlike his predecessors, was native Taiwanese – was troubled by a continued domination of former mainlanders in the KMT and political bodies, by an emerging opposition to the omnipotent KMT, and by popular demands for official separation and independence from mainland China. He embarked on a gradual process, leading the KMT down a path of political reform. This process began with an ad hoc National Affairs conference, which came to serve as a bit of an informal extra-constitutional assembly. Only the National Assembly could legally revise the constitution, but lacked legitimacy to do so as it was dominated by former mainlanders and not representative of public opinion.

Under Lee's leadership, Taiwan's constitution was revised through a sequence of amendments (in 1991, 1992, 1994 and 1997). The first step in 1991 saw the National Assembly dominated by the old KMT guard put an end to the Temporary Provisions. It also decided on ten constitutional amendments. Half of these replaced the antiquated electoral rules – i.e., that the National Assembly and the Legislative Yuan be entirely elected in mainland China – with electoral rules for Taiwan alone, thus making these elected bodies much more representative. Another amendment gave the President the right to issue emergency orders, but only with ratification of the Legislative Yuan, thus putting in place some clear executive constraints.

After this first step, a general election was held in late 1991 to replace the whole National Assembly. The newly elected body, which was still dominated by the KMT, met in 1992 to discuss further amendments to the constitution and adopt 8 new articles. The most important amendment was to introduce direct, rather than indirect, election of the president by "the entire electorate in the free area of the Republic" (effective from the 1996 election), while maintaining the National Assembly's right of recall. The other features included giving the National Assembly the power of consent for appointments of leaders and Grand Justices of the Judicial Yuan (the constitutional court). As a result of the 1991 and 1992 changes, the basic institutions for a semi-

[7] That said, in his very last years in office, Chiang did start to put a political reform committee in place (in March 1986) and lifted martial law (in July 1987).

presidential system with clear checks on the president was now in place. From 1992 the executive constraint score in Polity IV is lifted to a 5.

Additional reforms in 1994 and 1997 would further enhance executive constraints by securing the independence of the members of the Judicial Yuan and introducing the right of the Legislative Yuan to remove the prime minister by a constructive vote of confidence. As per these changes, the Polity IV executive constraint score went up to a 6 in 1997 (and subsequently to a 7 in 2004). In this reform process, Taiwan also developed from a one-party state into a multi-party democracy, where the KMT was challenged by the Democratic Progressive Party and the New Party (branching off from the KMT).

Analogous to the Spanish case, this case illustrates how political reforms were nictitated when two resilient leaders, who both died in office (the two Chiangs), were replaced by a less resilient one (Lee).

Sani Abacha in Nigeria[8] In the six first years after its independence from the United Kingdom in 1960, Nigeria had a fragile democracy formally based on political institutions similar to those of its former colonial power, the UK. In the wake of mounting ethnic and political tensions, the country went through several military coups in 1966, followed by the Nigeria-Biafra civil war. Over the next 33 years, it would be dominated by members of the military elite and was more or less constantly under autocratic rule, except for a few brief and failed attempts at democratic rule. Elections were held off an on, but as a rule these were manipulated by incumbent leaders.

In 1993, General Sani Abacha came to power through another military coup. Abacha came to lead Nigeria's perhaps most brutal regime, which used its powers to enrich Abacha's family and close allies. He met calls for civilian and democratic rule with large doses of repression which underpinned his resilience as a leader. Abacha's government was the Provisional Ruling Council (PRC), an elite group of military leaders that ruled by decree. Under continued pressure to implement political reforms, in October 1995 he adopted a three-year timetable for transition to civilian rule. Abacha set up a new electoral commission to produce guidelines for the establishments of political parties, at the same time as he dissolved existing opposition groups. State assembly and gubernatorial sham elections were held in the spring of 1998, among the five parties sanctioned by the commission, and the UNCP – a proxy party for the Nigerian military – won large victories. The scene seemed staged for a pseudo election to extend Abacha's unchecked rule. Not only did the military express its support for Abacha, but all five state-recognized parties had nominated Abacha as the single candidate for the elections to be held in October 1998. Polity IV codes executive constraints during the Abacha period, up until 1997, at their lowest value of 1.

However, in June 1998 Abacha died in office of a sudden heart attack. The PRC, still ruling by decree, quickly appointed Chief of Staff Abdulsalami Abubakar as Abacha's successor. Abubakar was a bit of a military intellectual, but he was definitely a member of the military elite, having served also in the earlier regime of General Ibrahim Babangida. But he lacked Abacha's resilience as a leader, in part because he had not led the coup in 1993. Upon his appointment, Abubakar declared that he would stick to Abacha's timetable for presidential elections. He and the PRC also released some political prisoners, including former General and President Olusegun Obasanjo.

To many's surprise, however, Abubakar went much farther. He recognized that long-term military rule and many human-rights infringements had seriously damaged the country's reputation and that the resulting international sanctions damaged the economy. In August and September, he maneuvered the PRC into undertaking far-reaching political reforms, which dissolved the five Abacha-controlled parties, abolished the compromised electoral commission replacing it with

[8] This section is based on Constitution Writing and Conflict Resolution (1999), Dagne (2002), Encyclopedia Brittanica (2012, Polity IV (2010), USAID (2006), and US State Department (2011).

a new one, fired Abacha's cabinet, and got rid of earlier decrees banning union activities and political strikes. Abubakar announced that he was appointing a committee to oversee extensive revisions to a proposal for a new constitution, to lay down the rules for the next civilian government. Eventually, the PRC adopted an extensive revision of the earlier 1979 constitution in early May 1999.

Abubakar also declared the earlier election results null and void and announced new national elections for February of 1999. One of the newly created parties, the People's Democratic Party, nominated Obasanjo as its presidential candidate and he went on to win the election by a large margin. According to the timetable, Obasanjo entered into office in late May 1999 under the newly adopted constitution. While the constitution still retains strong powers in the hands of the president, it provides for checks on those powers through a bicameral legislature that must approve appointments and may oppose government proposals. It also gives a more important role to the judiciary, especially the Supreme Court. Even though Nigeria has gone through difficult political times with ethnic and religious tensions and rivalry regarding oil revenues, the new political institutions have survived to this day. As of 1999, Polity IV codes the executive constraints variable at 5, meaning that "substantial limitations" on its government are in place.

Like the other two cases, Nigerian recent history illustrates how the death in office of a resilient leader, and his being replaced by a less resilient one, can pave the wave for extensive constitutional reforms introducing stronger constraints on the executive.

3 Model

Our model is a threefold extension of the two-period, two-group, one-actor model sketched in Besley and Persson (2011a, Ch. 7) to an infinite-horizon, multiple-group setting, which explicitly distinguishes groups and their leaders. The incumbent government in power decides how to deploy a fixed tax revenue between transfers and public goods, being more or less constrained by current political institutions. In view of their prospect of surviving in office, incumbent groups choose executive constraints for the next period.

Basics and groups There is an infinite horizon with time periods denoted by $t = 1, 2, ...$ The population is normalized to unity and divided into $\frac{1}{e}$ equal-sized groups indexed by J. The incumbent government in period t belongs to one of these groups, which is denoted by I_t. The other groups are in opposition and are indexed by the list O_t^J. If the incumbent government is thrown out at the end of period t, one of the previous opposition groups is randomly chosen (with equal probability) to be in power in period $t+1$. All decisions on behalf of the incumbent group are taken by a leader, with characteristics described below

Income, preferences, and private consumption All individuals have an equal, exogenous and constant (net of tax) income y. The utility function of a member of group J in period t is linear in private and public goods

$$u_t^J = \alpha g_t + x_t^J \ .$$

Variable g_t is the *per-capita* provision of public goods by the incumbent. The value of public goods is given by α, with $1 < \alpha < \frac{1}{e}$.

Variable x_t^J denotes private consumption, which depends on the status of a group. For all opposition groups, it is given by

$$x_t^J = y + s_t^J \ , \quad J \in O_t^J,$$

where s_t^J is a *per-capita* transfer payment to all group J members. For simplicity, we work with the case $s_t^J = s_t$, so that all non-governing groups are treated in the same way. Any member of the incumbent group, including the leader, has private consumption

$$x_t^J = y + b_t \ , \quad J = I_t,$$

where b_t are the *per-capita* rents, extracted by the period-t leader on behalf of his group – these rents could be generated endogenously through predatory activities, as in Besley and Persson (2011a, Ch. 3). Thus, all members of the incumbent group get the same share of rents.

Everybody discounts the future with discount factor $\delta \in (0,1)$. There are no savings in the model.

Government budget constraint The incumbent leader has access to some exogenous revenue of T *per group,* in total amount $\frac{T}{e}$. This income can be spent on three items: public goods in total amount $\frac{g_t}{e}$, transfers to members of the incumbent group b_t, and transfers to members of all other groups in total amount $s_t(\frac{1}{e} - 1)$,

The government budget constraint can thus be written as

$$T = g_t + s_t (1 - e) + e b_t \ .$$

Within-group leader turnover In each period t, the incumbent group I_t starts out with a specific leader in power. We use $r_{t-1} \in [r_L, r_H]$ to denote a leader's resilience. In the data, we will use two variables to represent high resilience: (i) leaders who will eventually die in office and (ii) leaders who have recently experienced a natural disaster, both these variables predict lower turnover. Higher resilience positively affects two things: (i) the likelihood that the leader will remain as the leader of the incumbent group, and (ii) the incumbent group's probability of staying in power.

Let $z(r_{t-1}, \nu_t) \in \{0,1\}$ denote the binary event that a leader with resilience r_{t-1} survives as leader of the incumbent group in period t, where ν is a random shock including death. We assume that $z(r_{t-1}, \nu_t)$ is increasing in r, i.e., more resilient leaders are less likely to lose the leadership of their group.

If a leader is replaced within the incumbent group, there is a random draw from the pool of potential leaders with mean resilience $\overline{r}$. Thus, the evolution of expected leader resilience conditional on ν is given by:

$$E(r_t) = \begin{cases} r_{t-1} & \text{if } z(r_{t-1}, \nu_t) = 1 \\ \overline{r} & \text{otherwise} \ . \end{cases}$$

We use $\overline{z}(r) = E_v \{z(r, v)\}$ to denote expected within-group turnover for a leader of resilience r.

Turnover between groups The probability that the incumbent group remains in power until the next period also depends on its current leader. Denoting this ex post (conditional) probability by q_t, we assume that it is simply equal to its leader's resilience:

$$q_t = r_t \ .$$

Before the realization of the random shock ν_t, the ex ante (unconditional) probability that the incumbent *group* survives in power when the resilience of the leader is r_{t-1} is given by

$$Q_t = Q(r_{t-1}) = \overline{z}(r_{t-1})\, r_{t-1} + [1 - \overline{z}(r_{t-1})]\, \overline{r} \ , \tag{1}$$

which we assume is increasing in r.[9]

Once the random shock, ν_t, is realized and the resilience of the leader is determined, then the probability that the period-t incumbent group loses his/her power at the end of the period is thus $1-q_t = 1-r_t$. If the incumbent group loses power, each opposition group has an equal probability to take over. If a new group enters into power, the leader of that group (with resilience drawn at random) becomes the country's new leader.

Political institutions Executive constraints can be strong or weak and they reflect just how badly an incumbent group can treat the other groups in the population. In terms of the model, this constrains the rents that an incumbent group can extract at the expense of others in society. Thus, we assume that the incumbent leader must give a fixed share, $0 \leq \theta_t \leq 1$, to every other citizen, for any unit of rents collected by members of its own group:

$$s_t \geq \theta_t b_t \ .$$

A higher value of parameter θ_t representing stronger executive constraints on the incumbent government, i.e., a form of institutional commitment. Concretely, this could represent stronger constitutional provisions limiting executive powers, which are enforced by a legislature and/or an independent judiciary.

To model the process of political reform, we follow the existing literature (e.g., Acemoglu and Robinson, 2006) in assuming a limited form of commitment, with political institutions chosen at time t being binding on decisions at $t+1$ (see further discussion below).

Timing To summarize the model laid out above, each period has the following timing:

1. The polity starts period t with an inherited incumbent group I_t, whose leader has resilience r_{t-1}, and inherited executive constraints θ_t, which bind for that period.

2. The incumbent leader chooses policy $\{g_t, s_t, b_t\}$ for the current period, and executive constraints, θ_{t+1}, for the next period.

3. Nature determines the period-t political stability shock ν_t. If the incumbent-group leader survives, then his resilience stays constant. If not, then a fresh draw from a pool of leaders determines r_t.

4. Group I_t is replaced with probability $1-r_t$. Each opposition group have an equal probability of taking over the executive, namely $\frac{(1-r_t)(e-1)}{e}$. If a new group takes power, the resilience of its leader is chosen at random.

The model is recursive, which allows us to first study period t, $\{g_t, s_t, b_t\}$, taking θ_t as given. We then study the choice of political regime θ_{t+1}, a more involved problem. We look for a Markov-perfect equilibrium where the state variables are $\{r_{t-1}, \theta_t\}$. Given our structure, we show that the decision over future institutions does not depend on θ_t.[10]

[9] A sufficient condition for this is that:

$$1 > \frac{E\left\{z_r\left(r,\nu\right)\right\}\left[\overline{r}-r\right]}{E\left\{z\left(r,\nu\right)\right\}}$$

for all $r \in [r_L, \overline{r}]$.

[10] In effect, the problem will reduce to a static comparison of the effect of θ. The focus on Markov perfection rules out history-dependent strategies.

Policy Beginning with public spending, the leader of the incumbent group in period t sets policy to maximize the group's own utility

$$u_t^I = \alpha_t g_t + y + b_t \ , \tag{2}$$

subject to the constraints on rents and transfers, and the government budget constraint. Policies do not depend on r and hence we write them solely as a function of θ. This recursive separability is key to the empirical strategy that we pursue below, i.e., it is key that leader characteristics associated with political survival are uncorrelated with policy preferences.

It is easy to see that the two constraints will all be satisfied with equality: in particular, transfers to opposition group citizens are set to a minimum $s_t = \theta_t b_t$. The remaining choice is how much to spend on public goods and how much to spend on rents. As utility is linear, the incumbent will always choose a "bang-bang" solution

$$\begin{aligned}
\hat{g}(\theta) &= \begin{cases} T & \text{if } \alpha \geq \frac{1}{\theta+(1-\theta)e} \\ 0 & \text{otherwise,} \end{cases} \\
\hat{b}(\theta) &= \left[\frac{1}{\theta+(1-\theta)e}\right](T-\hat{g}(\theta)), \text{ and} \\
\widehat{s}(\theta) &= \left[\frac{\theta}{\theta+(1-\theta)e}\right](T-\hat{g}(\theta)) \ .
\end{aligned}$$

The incumbent leader either spends all available funds on public goods, or on rents to his own group (and necessary transfers to opposition groups), depending on the existing executive constraints. Since $1 < \alpha < \frac{1}{e}$, by assumption, all residual spending is on public goods (rents) when θ is above (below) $\frac{1-\alpha e}{\alpha(1-e)}$. Strong executive constraints – i.e., $\theta \in [\frac{1-\alpha e}{\alpha(1-e)}, 1]$ – induce equality in outcomes in each period by guaranteeing that all spending is on public goods rather than transfers.

Choice of institutions The choice of institutions depends on ex-ante political stability, which is fully captured by the resilience of the leader of the incumbent group, r. We can now state the following result, which is proved in the Appendix:

Proposition 1 *The choice of executive constraints depends on the probability that the incumbent group retains power as follows:*

$$\hat{\theta}(r) = \begin{cases} \frac{1-\alpha e}{\alpha(1-e)} & \textit{if } Q(r) \leq \alpha e \\ 0 & \textit{otherwise.} \end{cases}$$

Thus more resilient leaders are less likely to pick strong executive constraints.

The prediction in Proposition 1 is symmetric across the initial institutions in place at the beginning of the period. Thus, it predicts transitions into or out of strong executive constraints depending on the current value of leader resilience. This mirrors the reality in the data that constraints on the executive move in both directions.

Even though we have allowed for a continuous choice of θ, the incumbent always pushes the choice of institutions to one corner or another. The value $\frac{1-\alpha e}{\alpha(1-e)}$ represents the point at which it becomes optimal to spend the whole budget on public goods, i.e., institutions are sufficiently cohesive. The executive constraints needed to achieve this are lower when public goods are more valuable (α is higher) or the incumbent group is larger (e is larger).

Although we have an infinite horizon, the tradeoff comes down to comparing the effects of changing θ on the policy in the next period, factoring in the possibility of group turnover. A

high probability of losing office leads incumbents to choose strong executive constraints. The choice is governed by a simple comparison of benefits and costs. The cost of strong constraints to the incumbent group are next period's rents if it remains in office. The benefit is an assurance that next period's spending will be on public goods if the incumbent group is ousted. Since expected group turnover $Q(r)$ in our model depends on the leader's resilience, this result ties the characteristics of leaders to the choice of political institutions; a more resilient leader is less likely to choose strong executive constraints.

Discussion of the model The model has several specific features to home in on how leader resilience affects the motive for political reform.

First, we have modeled political control as opportunities for grabbing a disproportionate share of government revenue. But the specific way of discriminating against the rest of society is not essential to the core argument. What we require is some policies on which there is a common agreement, while others have benefits which are particular to specific groups (as in Lizzeri and Persico, 2004). The latter could include non-economic policies, e.g., some kinds of regulations of rights (as in Lagunoff, 2001) or specific kinds of public spending over which preferences diverge. This would be particularly relevant if the model were extended to allow for group heterogeneity in preferences, creating a role for fractionalization and polarization.

Second, the turnover probability could be made endogenous by allowing the incumbent to choose whether to repress opposition groups.[11] Shocks to repression costs would then provide another influence on political instability as in Acemoglu and Robinson (2006).

Third, the model does not allow for any means of disciplining incumbents beyond changing institutions. Thus, it rules out links between political turnover and incumbent policy choices. In a model with some form of accountability, incumbent groups could develop reputations to make policies more cohesive. Except in extreme cases, however, this would not fully replace the role of institutional constraints.

Fourth, a natural extension of the model would be to allow for costs of changing institutions. The "ink and paper" costs of changing a constitution are probably not significant. The appropriate foundations for costs beyond ink and paper are not self-evident. Perhaps constitutional reforms create stickiness by facilitating changes in informal institutions, changing inertial norms of behavior in the political system. Changes in norms might best be thought of as a further state variable, similar to what Persson and Tabellini (2009) call "democratic capital". Institutional choices would then be conditioned on this state variable. More generally, sources of state dependence that imply costs of institutional change would make an incumbent group weigh these costs against the benefits of reform, which could create a status-quo bias. Practically, this would result in θ_{t+1} becoming a function of the institutions in place θ_t. Partly to reflect such concerns, we will allow for state dependence in our empirical approach below.

Fifth, and finally, as mentioned in the introduction, reforms are defensive and anticipate the possibility of a group losing power. However, they do not change the probability that a group remains in office. To introduce the latter is another natural extension of the approach and in Section 6 we take a step in this direction by modeling the openness of access to power (such as a widening of the franchise). That section also presents empirical results, which suggest that – contrary to the reforms of executive constraints – this other aspect of political reform is not strongly correlated with our two measures of leader resilience.

[11] A previous version of the paper considered a two-period version with endogenous repression. Besley and Persson (2011a, Ch.7) includes a two-period model that also allows for the possibility of civil war.

4 From Theory to Data

To bring the model to the data requires measurement of key variables. In this section, we discuss how to measure these and the resulting summary statistics. We also discuss how to formulate an econometric structure that rhymes with the predictions of our model.

4.1 Measurement

Political institutions Our core measure of strong executive constraints is derived from the executive-constraints variable in the Polity IV data, "xconst". It is available for a large number of countries over a long period of time, essentially since becoming an independent state (or since the firstcoded data, in 1800). This variable takes on integer values between 1 and 7. As our core measure, we use a binary indicator $\theta_{i,t}$ which is equal to one if country i has a score greater than or equal to 5 in year t.

We use this particular cutoff for two reasons. First, plotting the empirical distribution of scores over countries and years, has a distribution with a local minimum at 4. Second, according to the Polity IV codebook, a value of 5 is the lowest at which there are "substantial limitations of executive power", where a "legislature or council often modifies or defeats executive proposals", or "sometimes refused funds to the executive", and "the accountability group makes important appointments to administrative posts" – see Marshall and Jaggers (2010, pp. 24-25). Using this classification, we have 171 reforms in an unbalanced panel of 167 countries with annual observations since 1875. This is the measure that was used to construct Figure 1. The robustness analysis to follow shows that we get similar results when marginally altering the cutoff for our binary indicator.

Leaders Since we do not observe turnover between groups in a large enough group of countries for a long enough time, we instead focus on turnover between leaders, i.e., exits of leaders from office. We use several data sources for this purpose. The core data set is Archigos (Goemans, Gledtisch and Chiozza, 2009) that documents which leaders are in office at which dates. We highlight a particular subset of leadership transitions, following the death or serious illness of the incumbent leader. Here, we exploit data from Besley et al (2011), who extend the sample of Jones and Olken (2005) with years before the second world war. The main biographical sources are the *Encyclopedia of Heads of States and Governments* (Lentz, 1994, 1999) and the *Encyclopedia Britannica*.

We also measure a number of other personal characteristics of leaders, including their education, occupation, social class, and their mode of entry in power. Education and occupation come from Besley and Reynal-Querol (2011). The sources of the social class and mode of entry variables are given in the Data Appendix.

Resilience We measure leader resilience in two ways. The first is an *ex post* measure based on whether a leader survives to leave office only due to natural death (or serious illness). Since 1875 just above 10 percent of all leaders – 217 out of a total of 2095 – left office in this way.[12] The rest leave office for other reasons, primarily due to electoral defeats, coups, or assassinations. Since the leaders who die in office have much longer tenure than other leaders, we regard the ability to survive until a natural death as a fixed-leader characteristic which proxies for resilience. For the purposes of our analysis it does not matter whether a leader who dies from natural causes in offices is resilient because he or she is deemed to be especially competent or because s/he has

[12]For a full description of these specific leadership transitions see Besley et al (2011).

an effective means of maintaining office through a powerful personal network. Our first measure of resilience is thus a binary indicator in country i , $p_{i,t-1}$, which is equal to one if the leader that holds office at the beginning of year t is someone who will eventually die in office, and zero otherwise. This indicator, which we refer to as "personal resilience", is positively related to $r_{i,t-1}$ in the model.

Our second measure of leader resilience relies on circumstances of the leader's tenure due to unforeseen events. Specifically, we rely on recent natural disasters during the leader's tenure in office. The underlying idea is that citizens' crave political stability and continuity in the wake of such disasters, the so-called rally-round-the-flag effect. That citizens rally around leaders in times of national stress is a well-known idea in political science, discussed for example in Kinsella, Russett and Star (2012, page 120). While there is some debate about the basis of this effect – a deep-seated psychological response of citizens, or a rational-choice based need to maintain stability in tough times – the exact interpretation does not matter for our analysis. They key for the approach to work is a strong enough *empirical* relationship between the incidence of natural disasters and political stability.

Our data on natural disasters measure comes from the EM-DAT data set. Specifically, we define a variable that adds together the number of such events in a given country and year.[13] We believe that these events are material enough in all cases to have affected significant fractions of the population. Having created the number of events, we create a dummy variable, denoted by $f_{i,t}$, which is equal to one if there is any disaster in a given country and year. We will work with lagged values, specifically $f_{i,t-1}$ and $f_{i,t-2}$ which we refer to as "rallying-around-the-flag resilience", or "flag resilience" for short. In the same way as for $p_{i,t-1}$, we postulate that these variables are positively related to $r_{i,t-1}$ in the model.

4.2 Summary statistics

Table 1 presents some summary statistics for the period 1875 to 2004 for the leader-year observations that we use in the core empirical analysis below. Six columns compare mean outcomes (by country-year) in the strong and weak executive-constraint samples. We also break it down according to whether leaders die from natural causes in office, our proxy for personal resilience.

Row (1) shows that among 11,005 country-years for which we have leader data, just under two thirds feature weak executive constraints. Row (2) shows that there are more personally resilient leaders in weak executive-constraints country-years. Rows (3) and (4) show that personally resilient leaders on average suffer fewer natural disasters during their term in office. Moreover, row (5) shows that turnover is lower under weak executive constraints. These differences indicate that some unobserved characteristics differ across the two sub-samples. This possibility of state dependence is one reason why we divide the sample according to the initial value of executive constraints throughout the empirical analysis.

A striking fact in row (7) is that countries with personally resilient leaders have longer tenure, something which is particularly pronounced in countries with weak executive constraints. With weak (strong) executive constraints, average tenure is 13.3 (5.7) years on average for personally resilient leaders compared to around 5.7 (4.1) years for non-resilient leaders. This is a plausible motive for using death in office from natural causes as a proxy for resilience. Leaders in countries with strong executive constraints are older on average when they come to power. However, row (8) of Table 1 shows that there is no marked difference between personally resilient and non-resilient leaders. That said, the longer tenure of leaders who die in office means that they will on

[13]Specifically, we add to together dummy variables denoting whether there was one of the following events in a given country-year: extreme temperature events, floods, slides, tidal-waves, droughts, earthquakes, storms, volcanic erruptions and wildfires.

average be older and this, in turn, makes it important to control for age and tenure when looking for differentials in institutional change when personally resilient leaders hold power.

Rows (9) through (13) consider educational attainment. Although we see little difference across strong and weak executive constraints, personally resilient leaders are on the whole less educated. In fact, this is the case regardless of educational category. This is why we also present results that hold constant leader educational attainment.

Leaders under weak executive constraints are more likely to come from a military background. Moreover, this varies systematically between leaders who do and don't die in office from natural causes (row (14)). Rows (15) through (20) suggest little in the way of occupational differences between leaders depending on whether or not they are personally resilient. As expected, row (20) shows that personally resilient leaders are more likely to be monarchs. Moreover, monarchs are more common with weak executive constraints.

Our next measures look at indicators of social class, which – following a common approach in sociology – is measured by the occupation of the leader's father. Specifically, we use a four-way classification to indicate the class of the leader, ranging from "underclass" to "upper class" in rows (21) through (24). These too show little difference across institutions and whether a leader is personally resilient.

Next, we look at the leader's mode of entry into office. As row (25) shows, personally resilient leaders are less likely to have been elected than non-resilient ones. Row (26) shows that personally resilient leaders are more likely to be selected by hereditary succession. But there is no difference (row (26)), in terms of whether they came into power in a (post-) colonial transition. There also appears to be no difference in terms of their being selected through autocratic means, via some oligarchical group as a military junta (row 28)).

Finally, inspecting the country characteristics in rows (29)-(39), there is strong evidence that the history of executive constraints is correlated with contemporary constraints. However, this history does not have any marked correlation with the likelihood that a country has personally resilient leaders. As expected, strong executive-constraint countries are richer (relative to the US) than their weak executive-constraint counterparts. But there is little difference in income depending on whether the leader is personally resilient, at least under weak executive constraints. Finally, the distribution across geographic regions is reasonably similar across countries in terms of whether or not leaders are personally resilient.

4.3 Econometric specification

Referring to Proposition 1, we have no direct measures of αe in the theory. However, we can postulate that this multiplicative variable has some distribution, with c.d.f. F. The specific timing comes from the theory – institutional transitions ($\theta_{i,t+1}$) take place in period t in response to ex-ante expected (group and leader) turnover (Q_t) in that period, which in turn depends on resilience, as determined by the type of leader and the type of circumstances (natural disaster or not) inherited from the previous period ($r_{i,t-1}$).

Suppose then that country i has a leader with resilience $r_{i,t-1}$ entering period t. Then, the model predicts a reduced-form relation, where the conditional probability (likelihood) of observing strong executive constraints in the next period is given by:

$$P_{i,t} = \text{Prob}\left[\theta = \frac{1-\alpha e}{\alpha\left(1-e\right)} : r_{i,t-1}\right] = 1 - F(Q\left(r_{i,t-1}\right)) \ .$$

Observe that this is decreasing in r – i.e., a group whose leader has higher resilience has a lower probability of introducing strong executive constraints. This suggests running a reduced-form

regression:

$$\theta_{i,t+1} = \alpha_i^\theta + \gamma_t^\theta + \tau r_{i,t-1} + \omega^\theta A_{i,t-1} + \varepsilon_{i,l,t} \tag{3}$$

where $\left\{\alpha_i^\theta, \gamma_t^\theta\right\}$ and country and year effects and the control vector $A_{i,t}$ contains other characteristics of the leader in office in country i at date t, or (time-varying) characteristics of country i. We expect $\tau < 0$, i.e. a resilient leader implies a negative effect on the reform probability.

This reduced form is made up from two "structural equations":

$$P_{i,t} = 1 - F(Q_{i,t}) \text{ and } Q_{i,t} = Q\left(r_{i,t-1}\right) \ ,$$

where $Q(\cdot)$ is given by (1). In words, the probability of a reform towards strong executive constraints, $P_{i,t}$, is a function of the probability that the incumbent group is replaced. While we do not have an exclusion restriction, we will also estimate separately these two relationships, which are the core of the mechanism in the theoretical model.

The first of these is:

$$q_{i,t} = \alpha_i^q + \gamma_t^q + \lambda p_{i,t-1} + \kappa_1 f_{i,t-1} + \kappa_2 f_{i,t-2} + \omega^q A_{i,t-1} + \eta_{i,t} \tag{4}$$

where $\{\alpha_i^q, \gamma_t^q\}$ are country and year effects, $p_{i,t-1}$ is personal resilience, and $f_{i,t-1}$ and $f_{i,t-2}$ are flag resilience in any of the two past periods.[14] We expect $\lambda > 0$ and $\kappa_1 > 0$ and $\kappa_2 > 0$ in the turnover equation. We also expect:

$$\theta_{i,t+1} = \alpha_i^\theta + \gamma_t^\theta + \chi q_{i,t} + \omega^\theta A_{i,t-1} + \varepsilon_{i,t}. \tag{5}$$

where $q_{i,t}$ is the probability that leader l in country i at date t leaves office and where $\left\{\alpha_i^\theta, \gamma_t^\theta\right\}$ are country and year effects.[15] We expect $\chi > 0$ under strong executive constraints. When estimating the standard errors $\left\{\varepsilon_{i,t}, \eta_{i,t}\right\}$ in (5) and (4) we cluster at the country level, allowing for arbitrary correlations over time.[16]

5 Resilience and Executive Constraints

We begin this section by presenting our baseline regressions results on the relation between leader resilience and reforms of executive constraints. Then we discuss their robustness.

5.1 Baseline results

The baseline results are contained in Tables 2 and 3. The first three columns are for country-years under strong executive constraints and the final three columns are for weak executive constraints. In both tables, we include year and country fixed effects. Table 3 has additional controls for the (log of) leader's tenure and leader age at entry, which are additional determinants of turnover. This is important, as our personal resilience measure could be proxying for them.

The reduced-form results in Column (1) of Tables 2 and 3 are based on (3). The results show no significant correlation between personally resilient leaders and transitions from strong to weak executive constraints. However, having a natural disaster in the previous period does seem to

[14] To diminish the collinearity of age and tenure, we measure a leader's age only at his entry to power.

[15] The sample of leaders comes from Besley and Reynal-Querol (2011). In years with multiple leaders in office, we focus on the leader who has been the longest in office. Thus, a leader who lasts only 2 or 3 months is not included.

[16] The results are robust to clustering at the regional level (10 regions), allowing for arbitrary correlations over time and within regions.

increase the probability of a transition to weak executive constraints in both tables. Column (2) in Tables 2 and 3 indicate a significant correlation between flag resilience and turnover in both cases and personal resilience in Table 3. As expected, $\{\lambda, \kappa_1, \kappa_2\}$ in equation (4) are all negative, in line with their interpretation as measures of resilience. In Table 3, column (2) we find that older and longer serving leaders are more likely to leave office. Our estimate of parameter χ in (5) in column (3) shows a negative and significant correlation between turnover and a transition from strong to weak executive constraints. Thus greater turnover increases the chances that a country stays with strong executive constraints.

Columns (4) through (6) look at the same issues for transitions from weak to strong executive constraints. Here, the reduced form in column (4) of Tables 2 and 3 shows a precisely estimated negative correlation between personal resilience as well as rallying-around-the-flag resilience and transitions to strong executive constraints. With a personally resilient leader in place, the likelihood of such reform is 1 percentage point lower per year than with a non-resilient leader. With a natural disaster, the corresponding correlation is 1.5-2 percentage points. These are large numbers, given the reform activity which took place over the period of our data. To see this, note that there were 88 reforms towards strong executive constraints in our 6,486 country-year observations from 1875 to 2004 – i.e., the unconditional probability of reform is about 0.013. Our estimated coefficients are thus on the same order of magnitude as this unconditional probability.

Column (5) parallels column (3) and shows a negative and significant correlation between resilience and turnover. As in column (3) of Table 2, we find that older and longer-serving leaders are more likely to leave office in any given year. Column (6) shows, in line with the theoretical prediction, that higher turnover is associated with a higher probability of a reform towards strong executive constraints. The estimated coefficient is quite precisely estimated.[17]

Taken together, the results in Tables 2 and 3 are consistent with a structural interpretation of the evidence, in line with our model. A country with weak executive constraints ruled by a leader with greater resilience – due to personal characteristics or circumstance – is less likely to introduce strong executive constraints, an effect which runs through lower expected turnover.[18]

5.2 Robustness

In this subsection, we explore the robustness of the baseline findings in Tables 2 and 3, always conditioning on having weak executive constraints. We first look at the sensitivity of the results to each of our two measures of resilience, and to permitting longer lags in the flag-resilience measure. Then, we test whether the estimates are robust to personal characteristics of the leader, and to economic and political conditions. We also break the estimation sample into sub-periods, and change the definition of the dependent variable. The results from these robustness checks appear in Tables 4-8.

Measures of resilience Table 4 varies the way in which we include the resilience measures in the analysis. In columns (1) and (2), we use only the leader's personal resilience. The estimates are very similar to the corresponding specifications in columns (4) and (5) of Tables 2 and 3. In column (3), we look only at the two flag-resilience variables. Once again the results are similar to the estimates in Tables 2 and 3. Columns (5) and (6) explore whether our chosen lag structure for flag resilience makes sense by allowing for five lags instead of two. The results show convincingly

[17] Since tenure and turnover are negatively correlated, this suggests, in line with theory that leaders with longer tenure are less likely to introduce strong executive constraints.

[18] In an effort to rule out reverse causation, we have looked at whether there is an empirical relationship between being a personally resilient leader and having executive constraints being tightened while a leader is in office, finding no significant correlation.

that only the first and second period lags are robustly correlated with turnover and transitions in executive constraints.

Leader characteristics and income The main idea of the paper is that resilience affects institutional reform due to its implications for expected turnover. But perhaps other measurable characteristics of leaders change also following the death (or entry) of a personally resilient leaders or after a natural disaster, and it is these other characteristics that drive institutional reform. It would also be problematic if natural disasters were to trigger large changes in the country's relative income with the resultant economic malaise making reforms towards strong executive constraints less likely. Table 5 explores these issues by including leader characteristics and GDP (relative to the Us) as additional controls.

Columns (1)-(3) of Table 5 ask whether the results are robust to adding three sets of leader characteristics as controls, namely educational qualifications (five categories), occupational background (eight categories), and social class (four categories). We focus on these characteristics because we have been able to collect data for a long enough time period (their means appear in Table 1). The main findings from earlier tables are robust.[19] Columns (4)-(6) focus on the flag-resilience variables and controls for a country's GDP level relative to the US (from the Maddison data set), finding once again that the baseline results are robust.

Finally, in columns (7)-(9), we include both the leader characteristics and the relative GDP together with the two measures of resilience. These results parallel those in columns (4)-(6) of Tables 2 and 3. Once again, the main results are robust.[20]

Political context Table 6 includes two additional sets of variables to check if our results are robust to political context and political history. In columns (1)-(3), we add categorical variables for the mode of entry of the current leader: election, inheritance, imposition by a colonial power, or some other form of entry. If the entry modes were systematically different for resilient and non-resilient leaders, and assassinated with different likelihoods of reform, this might drive our earlier results. However, we obtain very similar estimates to those in earlier tables.[21]

Resilient and non-resilient leaders could conceivably enter at different points in a country's political history. Specifically, suppose that personally resilient leaders are more likely to appear early on, when the country has little or no experience with strong executive constraints, and that such experience promotes future reforms into this regime. This channel is in the spirit of Persson and Tabellini's (2009) analysis of democratic capital. However, including the proportion of years with strong executive constraints in a country's history in columns (4)-(6), along with the mode of entry, suggests that this is not the case. Again, the estimates are almost identical to the baseline estimates in Tables 2 and 3.

Estimation period Columns (1)-(6) in Table 7 display the results when we estimate the baseline specification, while splitting the sample before and after World War II. We would expect the smaller sample sizes to blow up the standard errors. Nonetheless, we find that our core results more or less hold up in each subsample, with very similar estimates to the baseline findings in columns (4)-(6) in Tables 2 and 3.

[19] It is also worth noting that the sample size in this case is lower than in the baseline estimates due to data availability.

[20] In two Appendix tables, available from the authors, we show that there are essentially no systematic correlations between our resilience measures and available leader characteristics: educational attainment, social class and occupation. This suggests that resilience is not proxying for these observable features of leaders.

[21] Table A3 gives the coefficients on the mode of entry variables where autocratic entry is the omitted category. None of the dummy variables representing modes of entry is significantly different from autocratic entry.

Measuring executive constraints We have used a specific cut-off for strong executive constraints. Columns (1) and (2) of Table 8 test the robustness of this by using a different definition with a less demanding cutoff (a value of 4 rather than 5 on the 7-point scale for the "xconst" variable). Once again, the core results from Tables 2 and 3 remain robust.

Method of estimation In columns (3)-(5) of Table 8, we estimate the core specifications with a fixed-effect logit model rather than a linear-probability model. The sign pattern and the significance levels of the resilience variables on executive constraints and turnover remain robust. This alternative model continues to find a positive relationship between turnover and reforms towards strong executive constraints.

Columns (6)-(8) report results from estimating the model using the full sample (strong or weak executive constraints), but allowing the resilience effects to vary depending on initial type of executive constraints. We would thus expect higher resilience to reduce the probability of a shift to strong executive constraints from weak executive constraints. This is indeed what we find in column (6) of Table 8. We get the opposite sign for countries with initial strong constraints, so there is more persistence of strong constraints when leaders are resilient. The coefficient on the level of executive constraints in column (6) is consistent with strong persistence in executive constraints. The results in column (7) suggest that countries with weak executive constraints tend to have higher turnover. Column (7) also gauges the correlation between turnover and adopting/retaining strong executive constraints. The coefficient for resilience on turnover is significant only when executive constraints are weak. Column (8) shows that for initially weak executive constraints, there is a positive correlation between turnover and strong constraints, whereas the opposite is true with initially strong constraints.

Summary Overall, the findings in Tables 4 through 8 suggest that the baseline results in Tables 2 and 3 are robust. First, they are consistent with the theoretical mechanism, which predicts a negative effect of leader resilience on expected political turnover. Both measures of resilience – whether a leader survives to dies in office or experiences natural disasters during his tenure – reduce turnover. Second, the results suggest that turnover is positively correlated with a transition to strong executive constraints. These results are robust to ways of measuring resilience as well as to including a range of controls including leader characteristics and/or country circumstances. The relationships between resilience, turnover, and executive constraints are not only statistically robust, but quantitatively significant: when a resilient leader is not replaced after having died in office, the annual probability of reform towards strong executive constraints doubles.

Alternative interpretations We have interpreted our empirical results in terms of a theoretical model, which highlights how resilience might drive institutional change. But it bears remarking that there are other potential explanations of the results. In particular, our theoretical idea of a causal effect from resilience to institutional change may be reversed.

Suppose that executive constraints were tightened for some other reason than resilience and – at the same time – such reforms also make it harder for a leader to hold on to power. Then, leaders in office when constraints are tightened would be less likely to stay in office and would hence appear less resilient. However, in the next section we will show that there is no systematic increase in openness when personally resilient leaders are in office.

In terms of flag resilience, natural disasters could usher in periods of lawlessness (real, or alleged by the government), which create an excuse for keeping the government relatively unconstrained. Although we have shown that our results are robust to including the level of national income

(which might suffer during a period of lawlessness), we cannot rule out this interpretation of why natural disasters matter for institutions.

6 Leader Resilience and Openness

Our theoretical approach is specific to executive constraints, and we have therefore maintained a focus on this institutional reform in the empirical analysis. A good deal of the political-economics literature on reform to date, in particular Acemoglu and Robinson (2000, 2006), has focused on the determinants of franchise extension.[22] In our framework, we can think about such an extension as a reform that makes access to power more open and contestable. In this section, we show that leader resilience does not have a clear-cut theoretical prediction for reforms towards greater openness. Moreover, there is no distinct pattern in the data. Hence, in line with what we expect from the approach, it is specific to a particular dimension of institutional change.

Modeling openness We extend the previous model, allowing incumbents to choose the degree of openness for recruitment to office next period. This affects political stability as it decreases the chance that any particular group will hold onto power. We also add a cost of holding on to power when institutions are not fully open.

Specifically, suppose $\rho \in [0,1]$ is a choice variable that affects openness, where $\rho = 1$ means complete openness (free and fair elections) and $\rho = 0$ complete closedness (e.g., leaders are only picked from a small, entrenched elite such as in monarchy). Let $\Gamma(r,\rho)$ denote the probability that a group whose leader has resilience r survives as the incumbent, and assume that Γ is increasing in r and that $\Gamma_\rho < 0$ and $\Gamma_{\rho\rho} < 0$. That is, a more open system reduces the probability that an leader survives. Let $\bar{\Gamma}(\rho)$ be the expected survival value when a new leader is chosen at random. Keeping office recruitment closed, $\rho < 1$, has a cost – e.g., because it requires spending on security or repressing other groups to avoid the risk of a revolution or a coup. For simplicity, this cost is linear in ρ and given by $[1-\rho]\,c$.

As before, a within-period political shock ν_t determines if the incumbent leader survives as the leader of his group. Before the realization of this shock, the ex ante (unconditional) probability that the incumbent *group* survives in power is given by

$$Q(r_{t-1},\rho) = E\left\{z\left(r_{t-1},\nu_t\right)\Gamma\left(r_{t-1},\rho\right) + \left[1-z\left(r_{t-1},\nu_t\right)\right]\bar{\Gamma}\left(\rho\right)\right\} \ .$$

The revised timing of the model is:

1. The polity starts period t with an an incumbent group I_t and its leader with resilience r_{t-1}, and inherited institutions, $\{\theta_t,\rho_t\}$, which both bind for the current period.

2. The incumbent leader chooses policy $\{g_t,s_t,b_t\}$ for the current period, and political institutions, $\{\theta_{t+1},\rho_{t+1}\}$.

3. Nature determines period-t political stability shock ν_t. If the leader survives, then his resilience remains the same. If not, a fresh draw determines r_t.

4. Group I_t is replaced in power with probability $1-\Gamma\left(r_t,\rho_{t+1}\right)$. Each opposition group has an equal probability of taking over the executive, namely $\frac{(1-\Gamma\left(r_t,\rho_{t+1}\right))e}{1-e}$. If a new group takes power, the resilience of its leader is chosen at random.

[22] In their framework, the fear of losing power in a revolution leads an incumbent elite to extend the franchise even though this may mean that the elite loses political power.

Choice of openness We begin by studying the case when θ is fixed but the incumbent can choose the level of openness ρ_{t+1}. In this situation, we can look at how the resilience of the incumbent group's leader affects the degree of openness in the next period. The optimal choice of ρ solves:

$$\rho(r) = \arg\max \left\{ Q(r,\rho) V^I(\theta) + [1 - Q(r,\rho)] V^O(\theta) - c[1-\rho] \right\}, \quad (6)$$

where $V^K(\theta)$ is the value of entering next period with group status $K = I, O$ and a given value of θ. There is a trade-off between the future probability of holding power and the present costs of repression. The key observation is that $V^I(\theta) - V^O(\theta) > 0$ for all $\theta < \frac{1-\alpha e}{\alpha(1-e)}$, and that this gap is decreasing in θ. The first-order condition for openness, assuming an interior solution, is:

$$c = -Q_\rho(r,\rho) \left[V^I(\theta) - V^O(\theta) \right]. \quad (7)$$

How openness depends on resilience shocks to the incumbent group's leader is ambiguous and depends on how such shocks affect the *marginal* gain from greater openness. That is, it depends on the sign of $Q_{\rho r}$, which is *a priori* unclear. For example, if $Q_{\rho r} > 0$, then resilience and openness are complements, i.e. $d\rho/dr > 0$. So having a more resilient leader leaving office will tend to reduce openness. This makes sense since having a leader who is more likely to stay in power means that the incumbent group can reduce repression costs by making the political system more open.

This ambiguity in the effect of r on openness is consistent with existing theories of franchise extension, which have tended to focus on shocks to repression costs – c in our model – to motivate increased openness. This, for example, is the modeling approach to franchise extension in Acemoglu and Robinson (2006). In our model, an increase in c would tend to increase openness unambiguously. The key takeaway from our analysis is that there is no clear-cut theoretical link between the resilience of leaders, in the sense that we have specified, and the decision to increase openness.

Evidence In Table 9, we re-estimate the core specifications from Table 2, but with a different dependent variable. Specifically, we replace the indicator for strong executive constraints with three different indicators for holding open elections. We have defined reforms of electoral institutions by drawing on a variety of data sets. From Polity IV, we use two measures. One is designed to capture the extent to which the chief executive is elected through competitive multi-party elections – the "Executive recruitment" variable. Another is designed to capture whether executive recruitment takes place in a setting where no significant group or groups are regularly excluded from the political process (the "Political Competition" variable). As an alternative variable to capture open contests for power, we use an indicator of the breadth of the franchise from Przeworski (2009), which provides data on suffrage rules for 187 countries between 1919 and 2000. More details on these variables, including precise definitions, can be found in the Data Appendix.

Each pair of columns in Table 9 show the reduced-form relationship between the elections variable and our resilience measures alongside the correlation between turnover and institutional change. In all cases, we condition of having initially weak executive constraints. In columns (1), (3) and (5), we find no reduced-form correlation between increases in openness and having a resilient leader in office. There is a correlation between turnover and openness measured as executive recruitment (column (2)) but not the other measures (columns (4) and (6)).

In addition to the specifications reported here, we have tried a large number of alternatives, using the subcomponents of the Polity IV measures, different cutoffs to define open elections, and alternative data sets such as the one by Cheibub et al (2010).[23] In no case, do we find a significant

[23]This variable is based on Przeworski et al (2000) and seeks to classify political regimes based on the notion that "for a regime to be democratic, both the executive office and the legislative body must be filled by elections". It is available between 1946 and 2008 for 199 countries.

relationship between resilient leaders and open elections.

This finding is important in dispelling the idea that we are capturing a generic "democratization effect" due to increases in turnover. As we have seen, there is not a clear theoretical reason to expect such an effect and the data do not suggest it either. More generally, the findings confirm the importance of specificity in studying political change beyond aggregate democracy measures. Most importantly for this paper, it gives credence to the notion that the mechanism behind political reform is the one suggested by our core theory.

7 Concluding Comments

Understanding the forces behind institutional change is a significant challenge in political economics. While the prevalence of strong executive constraints has increased over time, we are not aware of any previous research which develops and tests a specific hypothesis about the driver of this specific dimension of reform. From a theoretical perspective, leaders with a stronghold on power have much weaker motives to reform. Empirically, we find that such resilient leaders are less likely to adopt strong executive constraints, a finding which is robust to a number of different specifications and inclusion of a variety of controls. As we have seen, the estimate is quantitatively important.

Our paper has two novel empirical aspects. First, we exploit data on death of leaders from natural causes in a different way than previous studies, such as Jones and Olken (2005). Indeed our analysis calls into question the idea to view the death of a leader as a "natural experiment". We think of a leader's death in office as a prospective source of variation in leader resilience, rather than as a random "event". However, as we have shown, this interpretation yields consistent empirical findings. The basic idea is that leaders who manage to stay on until the grim reaper forces them from power are different, in view of their much longer tenure. That does *not* imply that leader death does not create dislocation (for good or ill) as earlier researchers have argued. However, dying leaders may behave differently throughout their tenure, as a consequence of being more resilient. Whichever way one looks at it, leaders and their personal characteristics do matter for political and economic outcomes.

Second, we have tested and exploited the much conjectured "rally-round-the-flag effect". We find that leaders who hold office when natural disasters hit are more likely to survive. This is an interesting finding in its own right. However, in the context of our paper it provides an alternative source of exogenous variation in leader resilience, which we can use to explore our proposed theoretical mechanism.

We have independently studied reforms of executive constraints and electoral institutions, but only found an effect of leader resilience on the former. However, an interesting idea for future research is to model explicitly the interplay between electoral openness and executive constraints. Our framework implies a complementarity between stronger executive constraints and greater openness, since openness increases the prospect of a leader leaving office, all else equal.[24] This logic suggests a possible sequencing of institutional reforms, where shocks to expected turnover may initially lead to stronger executive constraints and then to franchise extension. It is interesting that England, the showcase in Acemoglu and Robinson (2000), introduced constraints on executive

[24]In terms of our model, a general approach would allow both institutional dimensions θ and ρ to be chosen. There are good reasons to expect a complementarity between stronger executive constraints and greater openness. This can be seen clearly in equations (6) and (7). Stronger executive constraints narrow $V^I(\theta) - V^O(\theta)$, the gap between the values of incumbency and opposition, and hence encourage greater openness, all else equal (since $Q_{\rho\rho} < 0$). Intuitively, as the incumbency-opposition gap diminishes, it becomes less worthwhile to incur the costs of maintaining a closed system of executive recruitment. In the limiting case of full cohesiveness, it is never worthwhile to reduce openness.

(royal) power – through reforms such as Magna Carta and the Glorious Revolution – long before the universal franchise.

Our paper has homed in on a specific aspect of institutional change, as a result of strategic and forward-looking behavior. We are not claiming that a model as simple as ours can capture the full range of complexity behind times of reform, as should be clear from the rich narratives in our three case studies. However, the simple theory suggests an empirical regularity, which also appears in the data. Thus the theory helps us link together what would otherwise appear to be a range of isolated experiences. More generally, the paper emphasizes the need to look at different aspects of institutions rather than studying aggregate democracy scores. However, it is clear that much more needs to be done to explore the sequencing of reforms and complementarities between specific constellations of political institutions.

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Appendix

A Proof of Proposition 1

As a provisional step, it is useful to define the indirect utility from public and private goods for the incumbent elite and other groups:

$$v^K(\theta) = \alpha\hat{g}(\theta) + y + \beta^K(\theta)(T - \hat{g}(\theta)) \text{ for } K \in \{I, O\} \ .$$

where $\beta^I(\theta) = \left[\frac{1}{\theta+(1-\theta)e}\right]$ and $\beta^O(\theta) = \left[\frac{\theta}{\theta+(1-\theta)e}\right]$.

Let $V^K(\theta, r)$ be the stationary value of arriving in any period when institutions are θ and the leader has resilience r where $K = I$ denotes being the incumbent and $K = O$ denotes opposition. Now define:

$$W^I(\theta, r) = rV^I(\theta, r) + (1-r)E\left\{V^O(\theta, w)\right\}$$

and

$$W^O(\theta, r) = rV^O(\theta, r) + [1-r]\left(\frac{e}{1-e}E\left\{V^I(\theta, w)\right\} + \frac{1-2e}{1-e}E\left\{V^O(\theta, w)\right\}\right).$$

To prove Proposition 1, we want to solve:

$$\hat{\theta}(r) = \arg\max_{\theta\in[0,1]}\left\{\overline{z}(r)W^I(\theta, r) + [1-\overline{z}(r)]E\left\{W^I(\theta, w)\right\}\right\} \ .$$

Observe that:

$$V^I(\theta, r) = v^I(\theta) + \delta\left[\overline{z}(r)W^I\left(\hat{\theta}(r), r\right) + 1 - \overline{z}(r)E\left\{\left(W^I\left(\hat{\theta}(r), w\right)\right)\right\}\right]$$

and

$$V^O(\theta, r) = v^O(\theta) + \delta\left[\overline{z}(r)W^O\left(\hat{\theta}(r), r\right) + 1 - \overline{z}(r)E\left\{\left(W^O\left(\hat{\theta}(r), z\right)\right)\right\}\right].$$

Using the envelope theorem:

$$\frac{\partial\left[\overline{z}(r)W^I(\theta, r) + [1-\overline{z}(r)]E\left\{W^I(\theta, w)\right\}\right]}{\partial\theta} = \begin{cases} 0 & \text{for } \theta \geq \frac{1-\alpha e}{\alpha(1-e)} \\ Q(r)v^I_\theta(\theta) + [1-Q(r)]v^O_\theta(\theta) & \text{otherwise .} \end{cases}$$

Moreover, $Q(r)v^I_\theta(\theta) + [1-Q(r)]v^O_\theta(\theta) < 0$ and $Q(r)v^I_{\theta\theta}(\theta) + [1-Q(r)]v^O_{\theta\theta}(\theta) > 0$ for $e \leq Q(r)$, so we only need to compare $\theta = 0$ and $\theta = \frac{1-\alpha e}{\alpha(1-e)}$ in this case. Moreover, given the recursive structure, we have

$$\overline{z}(r)W^I(0, r) + [1-\overline{z}(r)]E\left\{W^O(0, w)\right\} \gtreqless \overline{z}(r)W^I\left(\frac{1-\alpha e}{\alpha(1-e)}, r\right) + [1-\overline{z}(r)]E\left\{W^O\left(\frac{1-\alpha e}{\alpha(1-e)}, w\right)\right\}$$

as

$$\frac{TQ(r)}{e} \gtreqless \alpha T \ .$$

Solving this condition, gives the inequality stated in Proposition 1. Suppose instead that $e > Q(r)$, then $Q(r)v^I_\theta(\theta) + [1-Q(r)]v^O_\theta(\theta) > 0$. Moreover, this implies that $\alpha e > Q(r)$ so that

$$Q(r)v^I(\theta) + [1-Q(r)]v^O(\theta) < \alpha T \text{ for all } \theta \in \left[0, \frac{1-\alpha e}{\alpha(1-e)}\right) \ .$$

Using the recursive structure, we get

$$\begin{aligned} & \overline{z}(r) W^I\left(\frac{1-\alpha e}{\alpha(1-e)}, r\right)+[1-\overline{z}(r)] E\left\{W^O\left(\frac{1-\alpha e}{\alpha(1-e)}, w\right)\right\} \\ > & \overline{z}(r) W^I(\theta, r)+[1-\overline{z}(r)] E\left\{W^O(\theta, w)\right\} \end{aligned}$$

for all $\theta \in \left[0, \frac{1-\alpha e}{\alpha(1-e)}\right)$. Thus, $\hat{\theta}(r)=\frac{1-\alpha e}{\alpha(1-e)}$, as required. ■

B Data sources and definitions

Leader Characteristics Education Graduate: A dummy that is equal to one if the leader has a graduate degree. Source: Besley and Reynal-Querol (2011)

Education College: A dummy that has value 1 if the leader has a college degree. Source: Besley and Reynal-Querol (2011)

Education High: A dummy that is equal to 1 if the leader has a high school level education (including a trade school or technical school). Source: Besley and Reynal-Querol (2011)

Education Elementary: A dummy that is equal to 1 if the leader left school after elementary school (or was privately tutored). Source: Besley and Reynal-Querol (2011)

Social Class: A variable that has value a value between 1 and 4 based on the father's job. The description of the 4 levels classification for the social status comes from Ludwig (2002). A value of 1 corresponds to Under-stratum (e.g., unable to keep job, bankrupt, imprisoned, enslaved, disabled, unsteady or seasonal employment, financially dependent on others, etc.). A value of 2 is a Lower-stratum (i.e., work for others without possessing special skills or professional training [e.g., peasants, laborers, seamstresses, blue collar workers, minor civil servants, etc.; work for self without many resources or employees [e.g., small farmer, vendor, small businessman, etc.]); A value of 3 is Middle-stratum ([i.e., special education, training, abilities required] (a) professionals, such as doctors, lawyers, scientists, bankers, business persons, teachers, ministers, and minor politicians, (b) professional creative artists (painters, musicians, writers, actors) (c)business persons or landowners with employees; A value of 4 corresponds to Upper-stratum ([i.e., established wealth, power or social status [e.g., the movers and shakers of society; aristocracy; landed gentry; moguls, upper crust, leaders of nations, major tribes, or political parties, etc.]) We look for leader's father job using the following sources: Lentz. (1994, 1999); Britannica Online Encyclopedia, Academic Edition (http://www.britannica.com/); The Statesman's Yearbook Online (http://www.statesmansyearbook.com/about.html); Barcelona Center for International Affairs' Political Leaders Biographies (CIDOB) (http://www.cidob.org/en/documentation/); and other online sources, as well as individual biographies from Lexis-Nexis.

Occupational dummy variables are from Besley and Reynal-Querol (2011)

Military: A dummy that is equal to 1 if the leader was in the military, before holding office.

Lawyer: A dummy that is equal to 1 if the leader was a Lawyer, before holding office.

Civil Servant: A dummy that is equal to 1 if the leader was a Civil Servant, before holding office.

Professor or Scientist: A dummy that is equal to 1 if the leader was a Professor or Scientist, before holding office.

Unskilled Worker: A dummy that is equal to 1 if the leader was an Unskilled Worker, before holding office.

Business: A dummy that is equal to 1 if the leader was in business immediately before holding office.

Monarch: A dummy that is equal to 1 if the leader is or has been part of the monarchy.

Mode of entry:

Elected: A dummy that is equal to one if the leader was elected to office in the first instance.

Hereditary: A dummy that is equal to one if the leader was selected by hereditary succession

Colonial: A dummy that is equal to one if the leader was colonial/transition selected

Other autocratic modes of entry: A dummy that is equal to one if the leader was selected/appointed by an oligarchy/junta, selected by constitutional succession or by in a military coup.

Sources: Lentz. (1994, 1999); Britannica Online Encyclopedia, Academic Edition (http://www.britannica The Statesman's Yearbook Online (http://www.statesmansyearbook.com/about.html); Barcelona Center for International Affairs' Political Leaders Biographies (CIDOB) (http://www.cidob.org/en/documen and other online sources, as well as individual biographies from Lexis-Nexis.

Electoral Institutions To obtain a comparable sample across countries and time to the core results, we first look at two summary indexes in the Polity IV data for executive recruitment and political competition, called "exrec" and "polcomp". The Executive Recruitment index has scores between 1 and 8. According to the Polity IV codebook, it is only for a score of 8 that the "chief executive (de facto head of government) is chosen through competitive elections matching two or more candidates from at least two major parties ... the electoral process is transparent and its outcomes are institutionally uncertain" – see Marshall and Jaggers (2010, pp. 64). We therefore define a baseline binary variable for enfranchised institutions, which is one if the "exrec" score is equal to 8 and zero otherwise. Using this baseline variable, our panel has 154 reforms since 1875. But we also try different, less demanding cutoff values.

The Political Competition score is coded between 1 and 10. By the codebook, only a score of 10 captures "Relatively stable and enduring political groups regularly compete for political influence with little use of coercion. No significant or substantial groups, issues, or types of conventional political action are regularly excluded from the political process." – see Marshall and Jaggers (2010, pp. 85). Following this coding, we define an alternative baseline binary variable for enfranchised institutions, which is equal to one if the "polcomp" score is equal to 10 and zero otherwise. This way, we obtain 50 reforms since 1875. Again, we try alternative cutoff scores.

Since these alternative Polity IV variables do not perfectly capture extensions of the franchise, we also exploit data from other sources. Przeworski (2009) provides data on suffrage rules for 187 countries from 1919 until 2000, which relies on detailed regional information. A necessary condition for a franchise extension is that elections are held at least once and Przeworski (2009) dates the changes of suffrage rules by the time of the first election under the new rules (not when electoral law was passed). He maps the suffrage (for males) onto a seven-category scale, where a level of 1 means that the franchise permits only estate representation, while a level of 7 means that it excludes only individuals below some minimum age, possibly combined with a residence requirement. Based on these data, we construct a binary indicator which is equal to one when a country has reached level 7 of franchise extension and zero otherwise.

Table 1: Summary Statistics

		Strong executive constraints	Weak executive constraints	Weak executive constraints	Weak executive constraints	Strong executive constraints	High executive constraints
				Resilient	Non-resilient	Resilient	Non-resilient
(1)	High executive constraints t-1	1.000 (4390)	0.000 (6615)	0.000 (1552)	0.000 (5055)	1.000 (484)	1.000 (3906)
(2)	High executive constraints	0.983 (4346)	0.012 (6486)	0.003 (1539)	0.015 (4945)	0.987 (479)	0.982 (3867)
(3)	Personal Resilient	0.110 (4390)	0.235 (6607)	1.000 (1552)	0.000 (5055)	1.000 (484)	0.000 (3906)
(4)	Flag Resilient t-1	0.185 (4390)	0.130 (6615)	0.082 (1552)	0.145 (5055)	0.072 (484)	0.199 (3906)
(5)	Flag Resilient t-1	0.133 (4390)	0.115 (6615)	0.077 (1552)	0.127 (5055)	0.054 (484)	0.142 (3906)
(6)	Turnover	0.266 (4390)	0.130 (6615)	0.068 (1552)	0.150 (5055)	0.143 (484)	0.281 (3906)
	Tenure and Age						
(7)	Tenure	4.255 (4390)	9.431 (6607)	13.333 (1552)	8.234 (5055)	5.702 (484)	4.076 (3906)
(8)	Age at entry	53.818 (4390)	45.163 (6604)	43.070 (1552)	45.806 (5052)	54.370 (484)	53.750 (3906)
	Education						
(9)	Graduate education	0.398 (3864)	0.139 (6020)	0.118 (1415)	0.145 (4605)	0.332 (455)	0.407 (3409)
(10)	College education	0.390 (3864)	0.361 (6020)	0.262 (1415)	0.391 (4605)	0.286 (455)	0.404 (3409)
(11)	High-school education	0.105 (3864)	0.184 (6020)	0.162 (1415)	0.191 (4605)	0.090 (455)	0.107 (3409)
(12)	Elementary-school education	0.093 (3864)	0.223 (6020)	0.295 (1415)	0.201 (4605)	0.215 (455)	0.077 (3409)

(13)	Illiterate	0.014 (3864)	0.094 (6020)	0.163 (1415)	0.072 (4605)	0.077 (455)	0.005 (3409)
	Occupation						
(14)	Military background	0.071 (4016)	0.350 (6136)	0.273 (1419)	0.373 (4717)	0.090 (455)	0.069 (3561)
(15)	Lawyer	0.299 (4016)	0.116 (6136)	0.039 (1419)	0.139 (4717)	0.305 (455)	0.298 (3561)
(16)	Professor/ scientist	0.128 (4016)	0.099 (6136)	0.101 (1419)	0.098 (4717)	0.095 (455)	0.132 (3561)
(17)	Business background	0.069 (4016)	0.025 (6136)	0.001 (1419)	0.032 (4717)	0.024 (455)	0.075 (3561)
(18)	Civil servant	0.100 (4016)	0.057 (6136)	0.030 (1419)	0.065 (4717)	0.086 (455)	0.102 (3561)
(19)	Unskilled	0.021 (4016)	0.016 (6136)	0.011 (1419)	0.018 (4717)	0.059 (455)	0.017 (3561)
(20)	Monarch	0.050 (4016)	0.202 (6136)	0.369 (1419)	0.152 (4717)	0.101 (455)	0.044 (3561)
	Social Class						
(21)	Underclass	0.025 (3137)	0.049 (4879)	0.019 (1445)	0.062 (3434)	0.046 (431)	0.021 (2706)
(22)	Lower class	0.196 (3137)	0.256 (4879)	0.237 (1445)	0.264 (3434)	0.146 (431)	0.204 (2706)
(23)	Middle	0.472 (3137)	0.255 (4879)	0.192 (1445)	0.282 (3434)	0.464 (431)	0.473 (2706)
(24)	Upper class	0.307 (3137)	0.440 (4879)	0.552 (1445)	0.393 (3434)	0.343 (431)	0.301 (2706)
	Mode of Leader Entry						
(25)	Elected	0.842 (3868)	0.255 (5528)	0.159 (1307)	0.285 (4221)	0.739 (429)	0.854 (3439)
(26)	Hereditary	0.046 (3868)	0.114 (5528)	0.246 (1307)	0.073 (4221)	0.107 (429)	0.038 (3439)
(27)		0.035	0.070	0.049	0.076	0.105	0.027

	Colonial transition	(3868)	(5528)	(1307)	(4221)	(429)	(3439)
(28)	Autocratic entry	0.096 (3868)	0.343 (5528)	0.285 (1307)	0.361 (4221)	0.149 (429)	0.090 (3439)
	Country Characteristics						
(29)	Past share of years in high executive constraints	0.681 (4390)	0.098 (6615)	0.092 (1552)	0.100 (5055)	0.843 (484)	0.661 (3906)
(30)	Real PPP-adjusted GDP per capita relative to US	0.482 (3766)	0.203 (4649)	0.211 (1032)	0.200 (3617)	0.547 (354)	0.475 (3412)
(31)	Sub Saharan Africa	0.115 (4390)	0.210 (6615)	0.116 (1552)	0.239 (5055)	0.200 (484)	0.104 (3906)
(32)	Middle East	0.020 (4390)	0.117 (6615)	0.156 (1552)	0.105 (5055)	0.023 (484)	0.020 (3906)
(33)	North Africa	0.005 (4390)	0.046 (6615)	0.048 (1552)	0.045 (5055)	0.012 (484)	0.004 (3906)
(34)	Europe	0.451 (4390)	0.169 (6615)	0.277 (1552)	0.136 (5055)	0.300 (484)	0.469 (3906)
(35)	Central Asia	0.000 (4390)	0.028 (6615)	0.022 (1552)	0.029 (5055)	0.000 (484)	0.000 (3906)
(36)	East Asia and Pacific	0.135 (4390)	0.111 (6615)	0.196 (1552)	0.085 (5055)	0.143 (484)	0.134 (3906)
(37)	South Asia	0.036 (4390)	0.059 (6615)	0.122 (1552)	0.039 (5055)	0.037 (484)	0.036 (3906)
(38)	Latin America and Caribbean	0.177 (4390)	0.278 (6615)	0.084 (1552)	0.338 (5055)	0.163 (484)	0.179 (3906)
(39)	North America	0.061 (4390)	0.000 (6615)	0.000 (1552)	0.000 (5055)	0.122 (484)	0.053 3906)

Note: See the Data appendix for sources and definitions.

Table 2: Turnover and Institutional Reform (Baseline Results)

	(1)	(2)	(3)	(4)	(5)	(6)
Executive Constraints	Strong	Strong	Strong	Weak	Weak	Weak
Dependent Variable	Executive Constraints	Turnover	Executive Constraints	Executive Constraints	Turnover	Executive Constraints
Mean of Dependent Variable	0.97	0.62	0.97	0.05	0.49	0.05
Personal resilience	0.008	-0.027		-0.010**	-0.041**	
	(0.005)	(0.018)		(0.005)	(0.017)	
Flag resilience (t-1)	0.012**	-0.109***		-0.018***	-0.103***	
	(0.005)	(0.024)		(0.006)	(0.014)	
Flag resilience (t-2)	-0.006	-0.060***		-0.015**	-0.081***	
	(0.007)	(0.021)		(0.007)	(0.013)	
Turnover			-0.036***			0.065***
			(0.009)			(0.010)
No. of leaders	1137	1137	1153	765	765	801
No. of obs.	4,384	4,431	4,887	6,560	6,690	8,135
R-squared	0.148	0.250	0.156	0.072	0.165	0.093

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data Appendix. Standard errors clustered by country in parentheses. Asterisks refer to the former: *** p<0.01, ** p<0.05, * p<0.10. All regressions fixed country and fixed year effects. The sample is for the period 1875-2004.

Table 3: Turnover and Institutional Reform (with Tenure and Age Controls)

	(1)	(2)	(3)	(4)	(5)	(6)
Executive Constraints	Strong	Strong	Strong	Weak	Weak	Weak
Dependent Variable	Executive Constraints	Turnover	Executive Constraints	Executive Constraints	Turnover	Executive Constraints
Mean of Dependent Variable	0.97	0.62	0.97	0.05	0.49	0.05
Personal resilience	0.009	-0.043**		-0.009*	-0.048***	
	(0.006)	(0.018)		(0.005)	(0.016)	
Flag resilience (t-1)	0.012**	-0.106***		-0.018***	-0.099***	
	(0.005)	(0.023)		(0.006)	(0.015)	
Flag resilience (t-2)	-0.005	-0.076***		-0.015**	-0.079***	
	(0.007)	(0.021)		(0.007)	(0.013)	
Tenure		0.043**			0.018**	
		(0.018)			(0.008)	
Age at entry		0.004***			0.004***	
		(0.001)			(0.001)	
Turnover			-0.038***			0.066***
			(0.009)			(0.010)
No. of leaders	1127	1127	1127	759	759	759
No. of obs.	4,346	4,392	4,346	6,486	6,615	6,486
R-squared	0.148	0.258	0.159	0.073	0.175	0.101

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data Appendix. Standard errors clustered by country in parentheses. Asterisks refer to the former: *** p<0.01, ** p<0.05, * p<0.10. All regressions include log tenure of the leader, the age of the leader at entry, as well as fixed country and fixed year effects. The sample is for the period 1875-2004.

Table 4: Turnover and Institutional Reform (Separate Resilience Variables)

Dependent Variable	(1) Executive Constraints	(2) Turnover	(3) Executive Constraints	(4) Turnover	(5) Executive Constraints	(6) Turnover
Personal resilience	-0.010**	-0.051***				
	(0.005)	(0.016)				
Flag resilience (t-1)			-0.018***	-0.100***	-0.02***	-0.093***
			(0.006)	(0.015)	(0.005)	(0.014)
Flag resilience (t-2)			-0.016**	-0.080***	-0.012**	-0.070***
			(0.007)	(0.013)	(0.006)	(0.011)
Flag resilience (t-3)					-0.004	-0.024
					(0.005)	(0.015)
Flag resilience (t-4)					-0.001*	-0.020
					(0.006)	(0.014)
Flag resilience (t-5)					-0.004	-0.024*
					(0.005)	(0.013)
No. of leaders	759	759	759	759	759	759
No. of obs.	6,486	6,615	6,486	6,615	6486	6615
R-squared	0.069	0.1631	0.072	0.173	0.073	0.173

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data Appendix. Standard errors clustered by country in parentheses. Asterisks refer to the former: *** p<0.01, ** p<0.05, * p<0.10. All regressions include log tenure of the leader, the age of the leader at entry, as well as fixed country and fixed year effects. The sample is for the period 1875-2004.

Table 5: Turnover and Institutional Reform
(Robustness to Leader Characteristics and Economic Conditions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variable	Executive Constraints	Turnover	Executive Constraints	Executive Constraints	Turnover	Executive Constraints	Executive Constraints	Turnover	Executive Constraints
Personal resilience	-0.009*	-0.049***					-0.018*	-0.018*	
	(0.005)	(0.017)					(0.010)	(0.010)	
Flag resilience (t-1)				-0.019***	-0.099***		-0.019**	-0.019**	
				(0.006)	(0.015)		(0.008)	(0.008)	
Flag resilience (t-2)				-0.016**	-0.077***		-0.012	-0.012	
				(0.007)	(0.013)		(0.008)	(0.008)	
Turnover			0.072***			0.095***			0.090***
			(0.015)			(0.013)			(0.020)
Controls	Leader characteristics	Leader characteristics	Leader characteristics	Income	Income	Income	Leader characteristics and income	Leader characteristics and income	Leader characteristics and income
No. of leaders	359	359	359	505	505	505	270	270	270
No. of obs.	4,472	4,557	4,472	4,568	4,665	4,568	3,390	3,390	3,390
R-squared	0.076	0.187	0.109	0.081	0.209	0.125	0.104	0.104	0.138

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data appendix. Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. In columns (1)-(3) and (7)-(9), education of the current leader is measured by five categories (post-graduate, college, high-school or corresponding, elementary school, no formal education), occupation in 8 categories (military, lawyer, professor-scientist, business, civil servant, unskilled, manual worker, other), and social class of father in 4 categories (upper/elite, middle, lower, under). Income in columns (4)-(9) is measured by the country's PPP adjusted GDP per capita relative to the US in the current year. All regressions also include log tenure of the leader, age of the leader at entry, as well as fixed country and fixed year effects. The sample is for the period 1875-2004.

Table 6: Turnover and Institutional Reform (Robustness to Political Context)

Dependent Variable	(1) Executive Constraints	(2) Turnover	(3) Executive Constraints	(4) Executive Constraints	(5) Turnover	(6) Executive Constraints
Personal resilience	-0.013**	-0.036**		-0.014**	-0.037**	
	(0.007)	(0.018)		(0.007)	(0.018)	
Flag resilience (t-1)	-0.019***	-0.097***		-0.018***	-0.096***	
	(0.006)	(0.015)		(0.006)	(0.015)	
Flag resilience (t-2)	-0.016**	-0.080***		-0.016**	-0.079***	
	(0.007)	(0.013)		(0.007)	(0.013)	
Turnover			0.086***			0.086***
			(0.012)			(0.012)
Controls	Mode of entry	Mode of entry	Mode of entry	Mode of entry and past constraints	Mode of entry and past constraints	Mode of entry and past constraints
No. of leaders	576	576	576	576	576	576
No. of obs.	5,401	5,522	5,401	5,401	5,522	5,401
R-squared	0.078	0.191	0.118	0.078	0.192	0.118

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data appendix. Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. Mode of entry in columns (1)-(6) refers to how the current leader entered office measured by four categories (elected, inherited, colonial transition, other autocratic modes of entry). Past constraints in columns (4)-(6) refers to the proportion of years in the past (since 1800 or independence), in which the country had High executive constraints. All regressions also include log tenure of the leader, age of the leader at entry, as well as fixed country and fixed year effects. The sample is for the period 1875-2004.

Table 7: Turnover and Institutional Reform (Robustness to Sample Period)

	(1)	(2)	(3)	(4)	(5)	(6)
Sample Period	Pre WWII	Pre WWII	Pre WWII	Post WWII	Post WWII	Post WWII
Dependent Variables	Executive constraints	Turnover	Executive constraints	Executive constraints	Turnover	Executive constraints
Personal resilience	-0.012**	-0.055*		-0.013	-0.055**	
	(0.005)	(0.031)		(0.009)	(0.024)	
Flag resilience (t-1)	-0.009**	-0.220***		-0.018***	-0.096***	
	(0.004)	(0.059)		(0.006)	(0.015)	
Flag resilience (t-2)	-0.023**	0.117		-0.016**	-0.083***	
	(0.011)	(0.159)		(0.007)	(0.013)	
Turnover			0.019**			0.105***
			(0.008)			(0.016)
No. of leaders	362	362	362	397	397	397
No. of obs.	2,380	2,423	2,380	4,106	4,192	4,106
R-squared	0.079	0.139	0.084	0.097	0.227	0.143

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data appendix. Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. All regressions also include the (log of) the tenure of the leader, age of the leader at entry, as well as fixed country and fixed year effects. Sample period varies, as indicated.

Table 8: Turnover and Institutional Reform
(Robustness to Measure of High Executive Constraint and Method of Estimation)

Dependent Variable	(1) Executive constraints > 4	(2) Executive constraints > 4	(3) Executive Constraints	(4) Turnover	(5) Executive constraints	(6) Executive constraints	(7) Turnover	(8) Executive constraints
Estimation method	OLS	OLS	FE Logit	FE Logit	FE Logit	OLS	OLS	OLS
Personal resilience	-0.008		-2.440***	-0.557***		-0.010**	-0.064***	
	(0.005)		(0.823)	(0.135)		(0.004)	(0.016)	
Flag resilience (t-1)	-0.021***		-1.043**	-1.060***		-0.010**	-0.087***	
	(0.007)		(0.421)	(0.170)		(0.005)	(0.014)	
Flag resilience (t-2)	-0.017**		-0.769*	-0.784***		-0.007	-0.068***	
	(0.008)		(0.426)	(0.171)		(0.006)	(0.011)	
Personal resilience * Strong Executive Constraints						0.021***	0.024	
						(0.007)	(0.022)	
Flag resilience (t-1) * Strong Executive Constraints						0.012**	-0.030	
						(0.006)	(0.025)	
Flag resilience (t-2) *Strong Executive Constraints						-0.004	-0.017	
						(0.008)	(0.022)	
Turnover		0.070***			2.671***			0.060***
		(0.011)			(0.293)			(0.009)
Turnover * Strong Executive Constraints								-0.092***
								(0.013)
Strong Executive Constraints at (t-1)						0.913***	0.077***	0.934***
						(0.008)	(0.020)	(0.007)
No. of leaders	721	721				1886	1886	1902
No. of observations	6,276	6,276	3,486	6,585	3,486	10,832	11,007	10,832
R-squared	0.079	0.106				0.945	0.219	0.947

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data appendix. In columns (1) and (2), the boundary between strong and weak executive constraints is (weakly) greater than 4, rather than 5, on the 7-degree scale for "xconst". In columns (3)-(5) we use fixed effect logit model. In columns (6)-(8) we use all ample and interact resilience variables and turnover with a dummy for high executive constraints (High executive constraints (t-1)) (state dependence model). Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. All regressions also include log tenure of the leader, age of the leader at entry, as well as fixed country and fixed year effects. Sample period varies, as indicated.

Table 9: Turnover and Electoral Reforms

Dependent Variable	(1) Exrec8	(2) Exrec8	(3) Polcomp10	(4) Polcomp10	(5) Przeworsky	(6) Przeworsky
Personal resilience	-0.007		0.004		0.013	
	(0.015)		(0.014)		(0.038)	
Flag resilience (t-1)	-0.019		0.001		-0.012	
	(0.015)		(0.002)		(0.015)	
Flag resilience (t-2)	-0.015		0.001		-0.007	
	(0.014)		(0.002)		(0.015)	
Turnover		0.038***		0.001		-0.003
		(0.015)		(0.004)		(0.013)
No. of leaders	734	734	759	759	724	724
No. of obs.	6,425	6,425	6,486	6,486	5,403	5,403
R-squared	0.406	0.407	0.407	0.407	0.742	0.742

Notes: The dependent variables are alternative indicators for open elections, defined in the text of Section 6 and the Data Appendix. Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. All regressions also include log tenure of the leader, age of the leader at entry, as well fixed country and fixed year effects. The sample is for the period 1875-2004.

ADDITIONAL TABLES:

Table A1: Leader characteristics and Resilience

Dependent variable	(1) College graduate	(2) High school	(3) Elementary School	(4) No formal education/ illiterate	(5) Under class	(6) Lower class	(7) Middle class	(8) Upper class
Personal resilience	0.006	-0.060	0.054	-0.000	0.029	0.055	-0.034	-0.050
	(0.076)	(0.052)	(0.059)	(0.048)	(0.029)	(0.051)	(0.058)	(0.061)
Flag resilience (t-1)	-0.011	-0.011	0.023	-0.001	-0.023	-0.022	0.005	0.040
	(0.024)	(0.018)	(0.023)	(0.018)	(0.018)	(0.031)	(0.030)	(0.026)
Flag resilience (t-2)	0.003	0.005	0.004	-0.012	-0.028*	-0.007	0.008	0.026
	(0.025)	(0.020)	(0.023)	(0.017)	(0.016)	(0.029)	(0.028)	(0.025)
No. of leaders	665	665	665	665	430	430	430	430
No. of obs.	6,007	6,007	6,007	6,007	4,902	4,902	4,902	4,902
R-squared	0.520	0.458	0.451	0.521	0.606	0.590	0.558	0.658

Notes: The dependent variables are indicators for level of education and social class as indicated. These are defined in the text and the Data appendix. Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. In columns (1)-(4) , education of the current leader is measured by five categories (post-graduate and college, high-school or corresponding, elementary school, no formal education), and social class of father in 4 categories (upper/elite, middle, lower, under). All regressions also include log tenure of the leader, age of the leader at entry, as well as fixed country and fixed year effects. The sample is for the period 1875-2004.

Table A2: Leader Characteristics and Resilience

Dependent variable	(1) Military	(2) Lawyer	(3) Professional Scientist	(4) Business	(5) Civil Servant	(6) Unskilled	(7) Monarch
Personal resilience	0.051	-0.024	-0.013	-0.019**	-0.052	-0.031	-0.015
	(0.061)	(0.025)	(0.037)	(0.009)	(0.032)	(0.024)	(0.046)
Flag resilience (t-1)	0.027	-0.010	-0.022*	0.007	-0.012	-0.018**	0.027*
	(0.027)	(0.019)	(0.013)	(0.007)	(0.012)	(0.009)	(0.014)
Flag resilience (t-2)	0.020	0.004	-0.022	0.003	-0.011	-0.011	0.008
	(0.028)	(0.017)	(0.014)	(0.006)	(0.011)	(0.007)	(0.014)
No. of leaders	717	717	717	717	717	717	717
No. of obs.	6,121	6,121	6,121	6,121	6,121	6,121	6,121
R-squared	0.455	0.388	0.547	0.291	0.420	0.324	0.782

Notes: The dependent variables are indicators for occupation, as indicated. These are defined in the text and the Data appendix. Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. Occupation is measured by 8 categories (military, lawyer, professor-scientist, business, civil servant, unskilled, manual worker, other). All regressions also include log tenure of the leader, age of the leader at entry, as well as fixed country and fixed year effects. The sample is for the period 1875-2004.

Table A3: Turnover and Institutional Reform (Robustness to Context)

Dependent Variable	(1) Executive Constraints	(2) Turnover	(3) Executive Constraints	(4) Executive Constraints	(5) Turnover	(6) Executive Constraints
Personal resilience	-0.013**	-0.036**		-0.014**	-0.037**	
	(0.007)	(0.018)		(0.007)	(0.018)	
Flag resilience (t-1)	-0.019***	-0.097***		-0.018***	-0.096***	
	(0.006)	(0.015)		(0.006)	(0.015)	
Flag resilience (t-2)	-0.016**	-0.080***		-0.016**	-0.079***	
	(0.007)	(0.013)		(0.007)	(0.013)	
Turnover			0.086***			0.086***
			(0.012)			(0.012)
Elected	-0.005	0.007	-0.006	-0.005	0.007	-0.005
	(0.008)	(0.015)	(0.008)	(0.008)	(0.015)	(0.007)
Hereditary	0.003	0.010	0.003	0.004	0.013	0.004
	(0.009)	(0.022)	(0.008)	(0.008)	(0.021)	(0.008)
Colonial	0.007	0.037	0.005	0.006	0.033	0.004
	(0.011)	(0.028)	(0.010)	(0.011)	(0.028)	(0.010)
Past constraints				-0.039	-0.149**	-0.030
				(0.047)	(0.072)	(0.044)
Controls	Mode of Entry	Mode of Entry	Mode of Entry	Mode of entry & past constraints	Mode of entry & past constraints	Mode of entry & past constraints
No. of leaders	576	576	576	576	576	576
No. of observations	5,401	5,522	5,401	5,401	5,522	5,401
R-squared	0.078	0.191	0.118	0.078	0.192	0.118

Notes: The dependent variables are indicators for either strong executive constraints or turnover, as indicated. These are defined in the text of Section 4 and the Data appendix. Standard errors clustered by country in parentheses. Asterisks refer to: *** p<0.01, ** p<0.05, * p<0.10. Mode of entry in columns (1)-(6) refers to how the current leader entered office measured by four categories (elected, inherited, colonial transition, other autocratic modes of entry). Past constraints in columns (4)-(6) refers to the proportion of years in the past (since 1800 or independence), in which the country had High executive constraints. All regressions also include log tenure of the leader, age of the leader at entry, as well as fixed country and fixed year effects. The sample is for the period 1875-2004.