

Regime Change, Democracy, and Growth

Caroline Freund and Mélise Jaud

Abstract

The empirical literature on the relationship between democracy and growth has yielded conflicting results. Cross-country studies have failed to identify a significant impact of democracy on growth, while within-country studies have found a strong positive effect of the transition to democracy on growth. We reconcile the conflicting evidence by showing that the positive effect of democratic transitions results from regime change as opposed to democratization. We identify over 100 transitions in the last half-century with various outcomes: to and from democracy, some partial, and some failed. The variety of experiences allows us to compare the growth outcome of democratic transitions with that of other transitions rather than with a no-transition counterfactual. Conditioning on regime change filters out selection effects and shows that transition to democracy yields no growth dividend compared to other types of regime change. We also show that countries that democratize slowly do not gain from regime change. These results suggest that the growth dividend from political transition results from swift regime change rather than from democratization.

JEL codes: N40, O43

Keywords: political transition, autocracy, event study

Caroline Freund has been a senior fellow at the Peterson Institute for International Economics since May 2013. Previously she was chief economist, Middle East and North Africa, at the World Bank (2011–13), and lead economist (2009–11) and senior economist (2002–09) in the research department of the World Bank. She was also senior economist at the International Monetary Fund (2006–07) and economist at the Federal Reserve Board (1997–2003). She can be reached at cfreund@piie.com. **Mélise Jaud** is an economist in the Chief Economist Office of the World Bank's Middle East and North Africa region. Prior to that she worked as an economic advisor to the Ministry of Agriculture in Mozambique. She can be reached at mjaud@worldbank.org.

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1. INTRODUCTION

Does democratic transition have a positive effect on economic growth? The difficulty in answering this question stems from the fact that revolutions that tend to precede democratic transitions are unlikely to be exogenous but rather driven by country-specific growth shocks. Put simply, poorly performing dictators are more likely to be ousted. This is perhaps most obvious in the countries of Eastern Europe and the former Soviet Union, where weak growth in the 1980s solidified people's demand for change and made sustaining the system too costly. But this is not unusual: Brazil suffered a balance of payments crisis three years before its transition in 1985, and the devastating economic consequences of the 1997 Asian financial crisis led to the fall of the Indonesian dictator Suharto less than a year later.

If transitions are endogenous, estimates of their growth consequences using “no transition” as the counterfactual are biased. In fact, a large cross-country literature does not find evidence of a significant correlation between democratic institutions and higher income growth (Alesina and Rodrik 1994, Helliwell 1994, Borner and Weder 1995, Barro 1996 and 1997, Minier 1998, Rodrik 1999, Przeworski et al. 2000, Tavares and Wacziarg 2001, Besley and Kudamatsu 2008, De Haan 2007).¹ By contrast, recent work focusing on within-country effects of democratization finds that transition boosts annual income growth by about 1 percentage point (Rodrik and Wacziarg 2005, Papaioannou and Siourounis 2008a, Persson and Tabellini 2009). One explanation for the positive within-country estimates is that there is an effect of democracy on income growth that is obscured in cross-country studies because of other country-specific factors, which can be controlled for more precisely using panel techniques. An alternative explanation, however, is that democratic transitions are more likely when the autocratic regime has performed poorly, and the positive effect of transition to democracy on growth is thus the result of an incompetent regime being replaced with a more competent one. In this case, it is the endogenous regime change and better economic policies of the new regime, rather than democracy, that brings growth.

In this paper, we disentangle the specific growth effect of democratic transitions from that of broader regime change. Our identification strategy is to use different types of transition as the counterfactual as opposed to the counterfactual of no regime change. We test whether a transition resulting in democracy has an additional growth effect, holding regime change constant. This enables us to reduce the endogeneity bias involved in comparing transition events with no-transition situations.

1. A large empirical literature also looks into the economic determinants of democratic change; see for example Acemoglu et al. (2008), Papaioannou and Siourounis (2008b), Przeworski and Limongi (1997), Barro (1999), Przeworski, Alvarez, Cheibub, and Limongi (2000), and Epstein et al. (2006). Investigating this question is beyond the scope of the current paper. The results of such an investigation are presented in our follow-up paper, Freund and Jaud (2013).

This paper builds a new data set of political regime transitions based on changes in the Polity IV Project scores in 158 countries over 1960–11.² We identify over 100 episodes of political regime transitions between autocracy and democracy for which income per capita growth data was available. Each episode is classified into one of four types—democratic, autocratic, failed, and gradual—based on the direction, depth, and sustainability of the transition.³ We first identify democratic transitions as rapid—occurring within 3 years—and large increases in the score on Polity IV’s –10/+10 scale. Autocratic transitions are defined in the same way but in reverse. We identify two additional types of regime change, failed and gradual, by relaxing the conditions on the magnitude and sustainability in the definition of democratic transitions. Failed transitions are rapid transitions to democracy that succeed in changing the regime temporarily or partially but do not result in sustained democracy, defined by a high level of polity score. Gradual ones achieve democracy, but the increase in the polity score occurs over a longer period, more than 3 years and up to 15 years.

Our main finding is that rapid regime change (taking 3 years or less) yields a significant long-run growth premium irrespective of whether or to what extent democracy is achieved. We first compare the impact on growth of regime change, whether democratic or autocratic, and show that the direction of the change does not matter. Rapid regime change yields an annual growth dividend of 0.5 to 1 percentage point over 7 to 14 years, but the growth dividend from moving from autocracy to democracy is not significantly different from that of moving in reverse, from democracy to autocracy—though the variance is greater in the case of autocratic transitions.⁴

Next, we compare democratic and failed transitions and show that the distinction does not matter for growth, as both types yield long-run growth effects of around 1 percentage point. Finally, we estimate the effect of democracy within failed transitions. We explore whether the “democratic window” after transition and before reversal to autocracy is associated with higher growth than the autocratic period after reversal. We find the reverse: The highest growth is achieved in the autocratic period.

Overall, our results suggest that it is the regime change and not democracy per se that yields the positive growth effects. The results are consistent with the cross-country literature, which finds no significant effect of democracy on growth.

2. In the remainder of this paper we will use the terms “regime change” and “transition” interchangeably to designate a change in the polity in place.

3. The definition of political regime change captures movements between democracy and autocracy. To be classified as an episode, there must be a significant change in the depth of democratic institutions, though the direction, magnitude, and duration are allowed to vary. Regime change by this definition does not include leadership changes from one type of autocratic regime to another, such as may occur following a coup, or from one democratic party to another, such as may occur following an election.

4. Besley and Kudamatsu (2008) find a similar result of autocracies versus democracies in tranquil times (i.e., not following transitions): Growth is not significantly different, but growth in autocracies has a higher variance.

A second important finding of this paper is that a gradual regime change yields no growth dividend, even though it ultimately leads to democracy. This compares poorly with the roughly 1 percentage point boost in long-term growth subsequent to rapid regime change. There are at least two plausible explanations for the differential growth patterns observed in rapid versus gradual transitions. First, it could be that the continuing struggle for power in gradual transitions undermines investment. The uncertainty associated with protracted regime change may be detrimental to firms' activity and investment decisions (Rodrik 1991). Alternatively, it could be that gradual transitions are not associated with endogenous regime change in the same way as rapid transitions. For example, in Ghana, the gradual transition to democracy happened under a single ruler (Jerry Rawlings) who maintained economic policies throughout the period.

The next section discusses the literature on democracy and growth, and describes how our paper contributes. Section 3 presents the political transitions data set and the methodology. Section 4 presents the main empirical findings, and section 5 performs robustness checks. Finally, the last section concludes.

2. DEMOCRACY AND GROWTH: WHAT DO WE KNOW?

This paper follows a large theoretical literature on the link between democracy and economic performance. Theory has long held ambiguous views of the effect of democracy on economic outcomes, and there is no definite reason why democracy would bring higher economic growth than autocracy. On the one hand, dictators typically have more power and hence the ability to steal more from the public, with deleterious consequences for growth (Olsen 1993, McGuire and Olson 1996). Moreover, the political freedoms that come with democracy may support economic rights and opportunities (Friedman 1962). On the other hand, democracies could be associated with a potentially greater role for special interests that misuse resources (Olsen 1982, Barro 1996, Grossman and Helpman 2001), while dictators insulated from such pressures and time-consuming negotiations may have an easier time making difficult economic reforms that yield only long-run benefits (Wade 1990, Rodrik 1999).

In addition to static differences between the two systems, the expected duration in office matters, which tends to be more limited in democracies. Conditional on remaining in office, rational dictators may see it in their long-run interest not to act predatorily, either because this reduces their future tax base or because their support base values public goods (Bueno de Mesquita et al. 2003, Besley and Kudamatsu 2008). Clague et al. (1996) show that transitory democracies can easily suffer from extensive expropriation, because the incentive to steal is greater when the time horizon is short. Similarly, Khan (2006) argues that in a democracy, if politicians believe there is little chance of reelection *ex ante*, corruption tends to increase *ex post*, leading to a democratic equilibrium with frequent turnover, high corruption, and low growth.

Our work also relates to a large strand of research on growth that considers the role of institutions and social context in shaping economic development.⁵ While this literature highlights the importance of institutions, which serve and are accountable to the broad population and not a small group, it does not go so far as to say democracy generates growth. The conclusions of the literature would be consistent with democracy promoting growth, to the extent pluralistic societies may have less extractive governments and set up better institutions. However, they could also be consistent with endogenous regime change promoting growth, assuming that people in countries with poor institutions and low growth would be more likely to push for a change in regime and demand better institutions.

In contrast, others have highlighted more immediate drivers of growth. Jones and Olken (2005) show that beyond institutions, which tend to change slowly, individual leaders also matter for growth. They use death in office as source of exogenous variation among leaders. They find that economic growth rates change significantly when autocratic leaders are unexpectedly removed from office, highlighting the importance of an individual persona in economic outcomes. Their results are consistent with rapid regime change generating a significant change in growth, as in this case leaders typically change, but not necessarily with gradual regime change altering growth, as gradual change may occur under the same leader. Luck also matters. Easterly et al. (1993) demonstrate the importance of regression to the mean in growth rates. This would suggest that if poor economic performance leads to regime change, the new regime would be likely to do better over the next decade, simply because the law of averages suggest that the country's luck is poised for change.

Finally, our work also relates to the literature on political instability and economic performance (e.g., Barro 1991, Alesina and Perotti 1996, Perotti 1996, Ades and Chua 1997, Jong-A-Pin 2009). This literature has found a negative relation between political instability and growth. One theoretical argument underlying this relationship relates to the effects of uncertainty on productive economic decisions (Benhabib and Rustichini 1996, Devereux and Wen 1998, Darby et al. 2004). Jong-A-Pin (2009) estimates that among different dimensions of political instability, only the instability of the political regime, changes in the polity or political leaders or constitution, has a robust and significant negative effect on economic growth. The results we find on rapid versus gradual regime change are consistent with this line of thinking, as there is no long-run growth dividend during a gradual change, which may tend to involve a longer period of uncertainty.

5. See Hall and Jones 1999; Acemoglu, Johnson, and Robinson 2001; Glaeser et al. 2004; Besley and Kudamatsu 2008; and De Haan 2007.

3. DATA AND METHODOLOGY

3.1. Democracy Data

We use the standard and widely used Polity IV dataset (Marshall, Gurr, and Jagers 2011). We use changes in the polity score to identify episodes of political regime change. The polity score provides a classification of regime type for countries with more than 500,000 people. Each year each country receives a score ranging from -10 to $+10$, where a negative or zero score denotes autocracy and positive values denote democracy.⁶ The polity score is an institution-based measure of regime type and reflects key characteristics of executive recruitments, constitutional constraints on executive authority, and the fairness and competitiveness of political participation. The extent to which polity scores correctly capture political freedom has been debated; beyond wide coverage, the main advantage of the Polity dataset when considering the effect of regime change on economic growth is that polity scores code precisely the start date of regime change.

3.2. Defining Transitions

3.2.1. Democratic and Autocratic Transitions

Consider first democratic transitions. The term “transition” designates the whole period from the old regime (here autocracy, characterized by a polity score below 1) to the new (full democracy, characterized by a score over 5). The term “transition year” designates the first year in which the new regime (here, full democracy) is attained. Formally, let p_{it} be country i 's score at time t , and let t_{iz} be a transition year. The transition year is specific to country i as well as to transition z for countries undergoing several transitions. We define a democratic transition by the following four criteria:

- (i) $\Delta p_i = p_{it} - p_{i,t-3} \geq 6$
- (ii) $p_{i,t-1} \leq 5$ and $p_{i,t} > 5$
- (iii) $\bar{p}_{i,pre} = \frac{1}{3} \sum_{k \in [3,5]} p_{i,t-k} < 1$
- (iv) $\bar{p}_{i,post} = \frac{1}{T} \sum_{k \in [1,T]} p_{i,t+k} > 5$

6. The Polity dataset dates back to 1800. We use the data starting from 1960 to match the GDP per capita growth data from the World Development Indicators (2012). The data are not rectangular, as some countries were created during the time period (e.g. the former Soviet bloc countries), or changed names (e.g., Czechoslovakia, which split into the Czech Republic and the Slovak Republic in 1993). New states and states that changed names are treated as new countries in our analysis. For newly-established countries, when no Polity data is available prior to the country creation, we impute the “Parent” state polity score to allow for the identification of transitions. The former Soviet Union countries include Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, the Kyrgyz Republic, Latvia, Lithuania, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. The former Yugoslavia countries include Bosnia, Croatia, Macedonia, Serbia and Montenegro, and Slovenia. And the former Czechoslovakia countries include the Czech Republic and the Slovak Republic.

Condition (i) follows Polity IV in defining a “complete regime transition” as a 6-point jump in the polity score in three years or less. Condition (ii) identifies the “transition year” t as the first year the new full democratic regime is in place.⁷ For some countries where there are a number of consecutive years for which these conditions are met, the starting date is chosen by taking the first among all contiguous eligible dates. Condition (iii) imposes that autocracy be in place over the period $t-3$ to $t-5$, i.e., three years before the transition year and the two years before that. Finally, (iv) is a sustainability condition. It imposes that the new democratic regime remain in place at least T years with T equal to either 7 or 14 years.⁸

Autocratic transitions are defined as follows:

$$(i) \Delta p_i = p_{it} - p_{i,t-3} \leq -6$$

$$(ii) p_{i,t-1} \geq -1 \text{ and } p_{i,t} < -1$$

$$(iii) \bar{p}_{i,pre} = \frac{1}{3} \sum_{k \in [3,5]} p_{i,t-k} > -1$$

$$(iv) \bar{p}_{i,post} = \frac{1}{T} \sum_{k \in [1,T]} p_{i,t+k} < -1$$

The polity score dropped sharply within three years, and democracy was in place for at least three years prior to transition. Since countries with a polity score of zero (the threshold value between autocracy and democracy) may embark on either a democratic or an autocratic transition, we allow the polity score to take a value of zero prior to transition in both definitions. For autocratic transitions the year of transition is the first year the polity score drops below -1 , and following transition we impose that the new autocratic regime in place be sustained for at least the T subsequent years. One distinction is that while democratic transitions must remain above a polity score of 5, autocratic transitions are not required to remain below -5 following transition. The reason for this difference is that we want to include autocratic transitions that go from a high level of democracy (above 5) to low levels of autocracy (-1).⁹

7. The cutoff level 5 for democracy is set to the mean value of the polity index in the democratic range of the index $[+1, +10]$. In addition, the polity score has a bimodal distribution, with most countries clustered at the high (> 5) or low (< -5) ends of the distribution. While scores above 5 mask substantial differences in the way democracies function, all countries with scores above 5, no matter how heterogeneous, are sharply different than the countries below 5.

8. These cutoffs maximize the number of transitions in our sample and allow enough years of observations to estimate the medium-run and long-run impacts of different types of transition on growth; results are similar using 5- or 10-year sustainability cutoffs. We also consider the end of the sample (eos) as a relevant time horizon.

9. Alternatively we define autocratic transitions as the semantic mirror of democratic transitions, that is, changing the polity threshold of -1 to -5 in conditions (ii)–(iv). The results are robust to this changes, but the sample of autocratic transitions is now smaller (we identify 19 episodes instead of 23); thus we do not use these as our main results.

3.2.2. Failed and Gradual Transitions

We identify two additional types of transitions, failed and gradual, by relaxing the conditions on the magnitude and sustainability in the definition of democratic transitions. Failed transitions are rapid transitions to democracy that succeed in changing the regime but not in achieving democracy that is a high level of polity score. Among failed transitions we distinguish failed-reversed and failed-partial transitions, termed reversed and partial respectively in the rest of the paper.

We define a reversed transition by the failure of condition (iv) that democracy is sustained following transition. High-level democracy (score above 5) is being achieved, but only temporarily, and there is a fallback into autocracy before the end of the sample period.

- (i) $\Delta p_i = p_{it} - p_{i,t-3} \geq 6$
- (ii) $p_{i,t-1} \leq 5$ and $p_{i,t} > 5$
- (iii) $\bar{p}_{i,pre} = \frac{1}{3} \sum_{k \in [3,5]} p_{i,t-k} < 1$
- (iv) $\bar{p}_{i,post} = \frac{1}{T} \sum_{k \in [1,T]} p_{i,t+k} < 5$

We define partial transitions by the failure of the conditions on the level of change, with a smaller jump in the polity score (3 instead of 6), and on the level of democracy achieved. Following transition, only low levels of democracy on the polity scale (score above 0 but below 5) are achieved. For partial transitions, the year of transition is the first year democracy is reached (polity score above 0).

- (i) $\Delta p_i = p_{it} - p_{i,t-3} \geq 3$
- (ii) $p_{i,t-1} \leq 0$ and $0 < p_{it} < 5$
- (iii) $\bar{p}_{i,pre} = \frac{1}{3} \sum_{k \in [3,5]} p_{i,t-k} < 1$
- (iv) $\bar{p}_{i,post} = \frac{1}{T} \sum_{k \in [1,T]} p_{i,t+k} < 5$

Finally, we define gradual transitions as transitions to full democracy that take longer.

- (i) $\Delta p_i = p_{it+j} - p_{it} \geq 6, j \in [4,15]$
- (ii) $p_{i,t-1} \leq 0$ and $p_{i,t} > 0$
- (iii) $p_{i,t+j-1} \leq 5$ and $p_{i,t+j} > 5, j \in [4,15]$
- (iv) $\bar{p}_{i,pre} = \frac{1}{3} \sum_{k \in [3,5]} p_{i,t-k} < 1$
- (v) $\bar{p}_{i,post} = \frac{1}{T} \sum_{k \in [1,T]} p_{i,t+j+k} > 5$

Condition (i) allows the jump in polity score to occur over 4 to 15 years instead of 3 years. As for partial transitions, the year of transition is the first year democracy is reached (score above 0).

3.2.3. Transition Treatment Dummies

For each type of transition, we define a set of transition years, t_{iz} for country i . Let \mathcal{D}_i be the set of democratic transition years, \mathcal{A}_i , \mathcal{F}_i , and \mathcal{G}_i and the sets respectively of autocratic, failed, and gradual transition years. Given our identification conditions, countries may experience more than one transition z , as long as the transition years are at least seven years apart.

For democratic transitions, our basic treatment variable is a dummy, $D_{iz,t}$, which is 1 in the first year of a democratic transition and in the T subsequent years that the democracy is in place, and takes the value 0 otherwise. Specifically,

$$D_{iz,t} = \begin{cases} 1 & \text{if } t \in [t_{iz}, t_{iz} + T] \text{ where } t_{iz} \in \mathcal{D}_i \\ 0 & \text{otherwise} \end{cases} \quad \text{if } \exists t_{iz'} \in [t - 3, t + 3] - \{t\} \text{ and } z \neq z': t_{iz'} \in \{\mathcal{D}_i, \mathcal{A}_i, \mathcal{F}_i, \mathcal{G}_i\}$$

Similarly, let $A_{iz,t}$, $F_{iz,t}$ and $G_{iz,t}$ be the treatment variables for autocratic, failed, and gradual transitions respectively. For countries that experience more than one transition over the sample period, the treatment dummy $D_{iz,t}$ is coded as missing for years overlapping with previous or subsequent transition events. Specifically, the dummy for the first transition excludes a three-year window before the next transition and all subsequent years, while the dummy for the following transition excludes a three-year window in the years following the prior transition.¹⁰ For example, Argentina experienced two transitions between 1961 and 2011, first a failed transition in 1973, then a democratic transition in 1983. The dummy $F_{iz,t}$ equals 0 from 1961 to 1972 and 1 from 1973 until 1979. The coding is interrupted in 1979, three years before the next transition, which begins in 1983. Similarly the dummy variable $D_{iz,t}$ equals 0 from 1977 until 1982, then 1 from 1983 until the end of the sample period. This helps identify growth effects of each particular transition and limits contamination from previous or subsequent episodes.

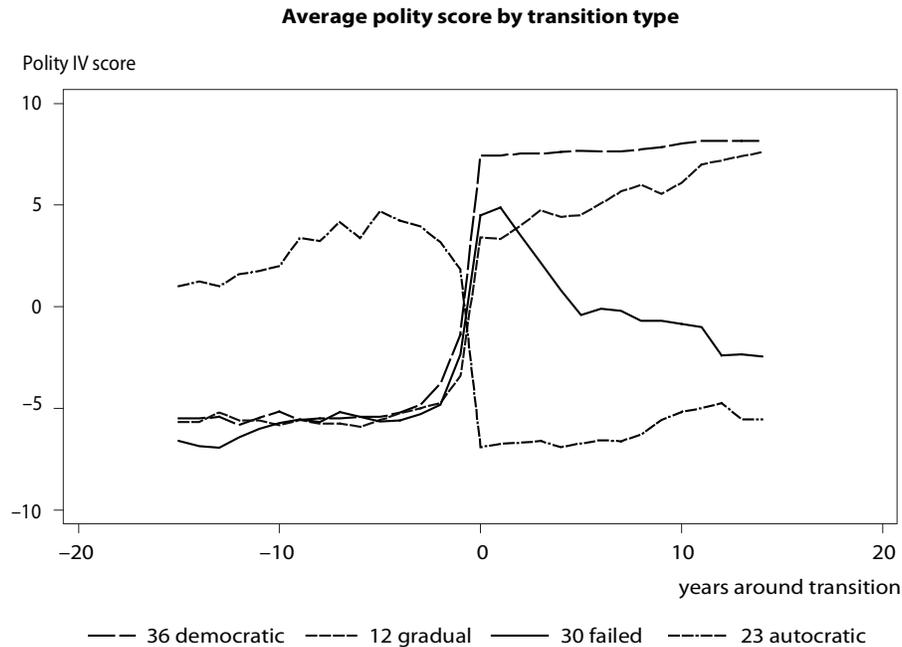
3.3. Descriptive Statistics and Prima-facie Evidence

We identify a total of 118 transitions for 158 countries over 1960–2011.¹¹ After restricting our sample to countries for which GDP per capita data (from the World Bank) is available before and after the transition date, our data set includes 103 episodes of regime change, including 23 autocratic transitions, 38 democratic, 30 failed, and 12 gradual. Table 1 summarizes our classification of transitions, together

10. We use a three-year window because in our definition of transitions, we allow the jump in polity score to happen in three years or less. The results are robust to taking one or two years in place of three years, as the buffer zone around transitions. Results are available upon request.

11. The figure 118 (103) is the sum of 27 (23) autocratic, 45 (38) democratic, 12 (12) gradual, and 34 (30) failed transitions.

Figure 1 Polity score before and after transition



Note: Unbalanced sample of 101 transitions in 75 countries.

Source: Polity IV Project, Marshall, Gurr, and Jaggers, 2011.

with observation counts, and table A in the appendix lists all transition events by type, country, and year of transition.

Seventy-five of our 158 countries (47 percent) initiated at least one transition, with 23 experiencing more than one. The majority of democratic transitions (e.g., Spain in 1978), proved sustainable. All 38 (counting only those with growth data, i.e., using the numbers in parentheses in table 1) were also sustained at least 7 years, 30 at least 14 years, and 36 until the end of the sample. As for autocratic transitions (e.g., the Gambia, where a coup in 1993 abolished the democratic regime that had prevailed since 1970), in all 23 cases the new regime remained in place at least 7 years; in 16 of them, at least 14 years, and in 9, until the end of the period. In 12 cases, transition toward democracy was gradual, and all were sustained until the end of the sample period. Mexico, which initiated a gradual transition in 1994, moving from autocratic to fully democratic over a six-year period, is an example. In 30 cases, the transition failed in that it was either partial (20 cases, including Ethiopia in 1993) or reversed later on (10 cases, including Nigeria in 1979 or Peru in 1980). In those cases, reversion to autocracy could be very swift (2 years in Nigeria) or take much longer (12 years in Peru).

Figure 1 shows the evolution of the polity score before and after transition for democratic, autocratic, failed (both reversed and partial), and gradual transitions. The discrete and substantial changes

in the level of the polity score are apparent. Democratic transitions swiftly move from autocracy to full democracy, while autocratic transitions do the opposite. Countries experiencing failed transitions reverse to autocracy within five years on average, and gradual transitions converge in steps towards consolidated democracy.

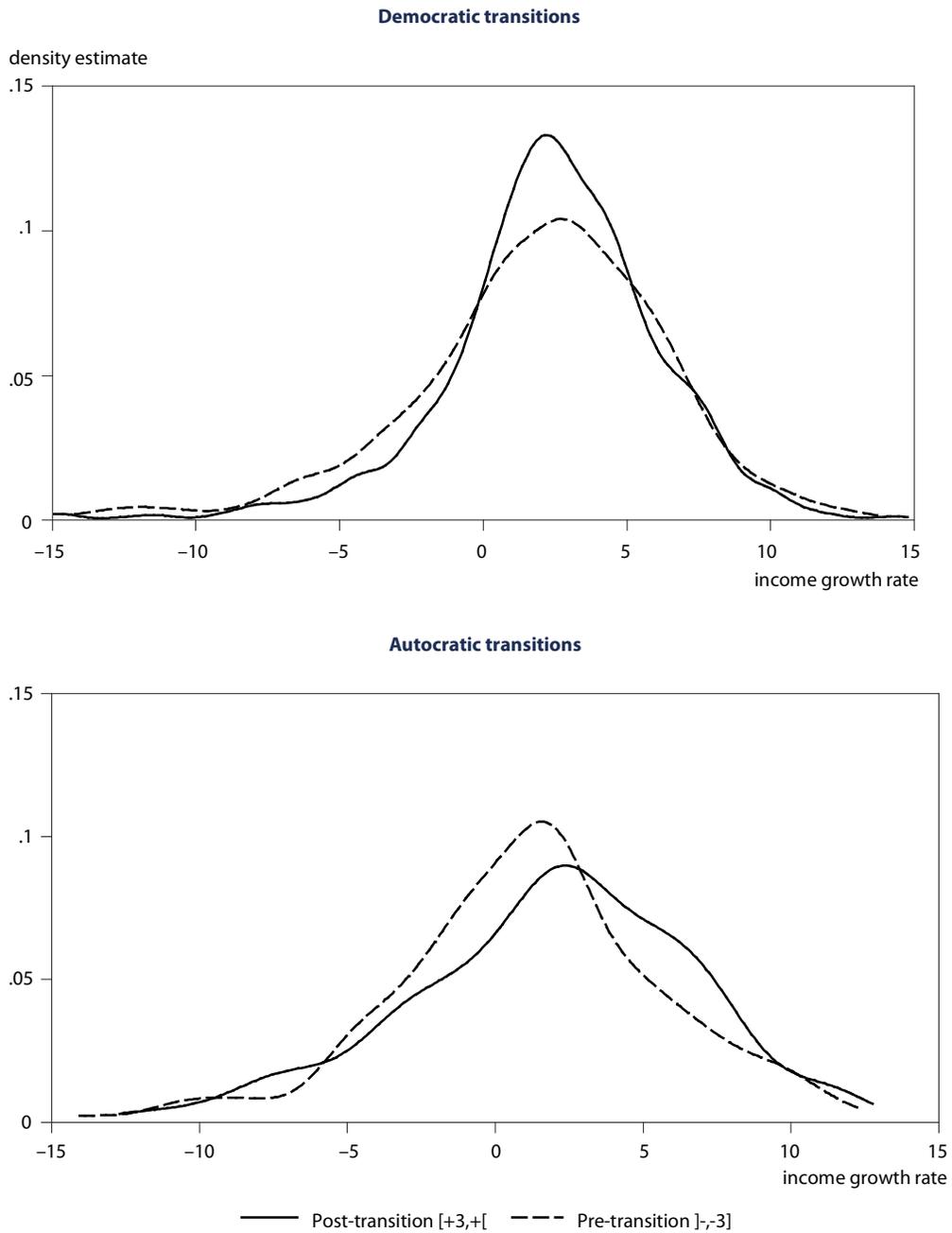
This classification allows us to estimate whether the direction, size, and sustainability of political transition between democracy and autocracy matters for growth, given that a significant change in the type of political system occurs. A potential concern is that the definition of regime change does not incorporate transitions within one type of political system, such as going from one type of autocratic regime to another type of autocratic regime. For example, the Iranian revolution in 1979, which replaced a monarchy with a theocracy, is not defined as a regime change event using the filter described above. While it may be useful to compare changes in the political system with revolutions that do not alter the extent of democracy, that question is beyond the remit of this paper. It would require a different data set and also require addressing a potentially more worrisome selection issue, as regime change that does not affect the extent of democratic institutions may be inherently different from regime change that is defined by them.

Figure 2 plots the distribution of average real GDP per capita growth rates during two time periods: prior and following transition for democratic and autocratic transitions. The prior-transition period spans from year 3 preceding the transition backwards, and the post-transition period spans from year 3 following the transition onwards. Both types of transitions are followed by slight rightward shifts of the growth distribution; for autocratic ones, the upper tail gets thicker, while for democratic ones, the lower tail gets thinner. But there is no substantial asymmetry: Growth effects appear similar in magnitude and fairly small. Below we estimate the effects, controlling for standard determinants of growth.

3.4. Empirical Strategy and Estimation Issues

Our strategy is to examine the effects of the various types of regime change, controlling for transition-specific and year-specific growth shocks. The unit of analysis is a country-transition-year observation. There are 158 countries, 51 years, and 4 broad types of transitions. Let t index years, i countries, z transitions, and J transition types $\{D = \text{democratic}, A = \text{autocratic}, F = \text{failed}, G = \text{gradual}\}$. In section 3.2.3 we defined for each type of transition a treatment variable $J_{i,z,t}$ with $J = \{D, A, F, G\}$ equal to 1 the year and T subsequent years of a type- J transition in country i , 0 otherwise. Similarly we define a treatment variable, regime change, which is equal to 1 in the year of transition and also in the T subsequent years after any democratic or autocratic transition, and 0 otherwise. Countries can experience more than one transition as long as the transition years are at least seven years apart. This reduces the overlap between successive transitions but does not eliminate it altogether; thus, a country's growth performance in a given year may enter the regression twice, once as post-transition and another time as pre-transition for the next one.

Figure 2 Democratic and autocratic economic growth distributions



Transitions: 38 democratic; 23 autocratic

Note: The density functions are estimated using the Gaussian kernel and the bandwidth that minimizes the mean integrated squared error. We include all episodes of democratic and autocratic transitions sustained for at least 7 years and with at least 14 years of data. The prior-transition period spans from year 3 preceding the transition backwards, and the post-transition period spans from year 3 following the transition onwards. The sample includes 38 democratic transitions and 23 autocratic transitions.

Sources: Polity IV Project, Marshall, Gurr, and Jagers, 2011; and authors' calculations.

The three-dimensional panel nature of our data allows us to estimate the effect of the different types of transitions on income growth using a difference-in-difference framework. We relate the log difference in annual income per capita in country i 's transition z at time t ($\log y_{iz,t}$) to a country-transition specific effect (φ_{iz}), time-varying shocks that affect all countries (φ_t), and a vector of country-transition specific dummies ($J_{iz,t}$). Our basic estimating equation is as follows,

$$g_{iz,t} \equiv \log y_{iz,t} - \log y_{iz,t-1} = \sum_{J \in \{D,A,F,G\}} \beta_J J_{iz,t} + \varphi_{iz} + \varphi_t + \varepsilon_{iz,t} \quad (1)$$

where ε is a disturbance term. We estimate equation (1) using all countries and years of data, including countries that do not experience a transition—always democratic or always autocratic—as this helps estimate the time effects. For those countries the i index subsumes the z index. The parameters β_J capture the contemporaneous effect of type-specific transitions on income growth. Fixed-year effects ensure that global growth trends do not confound our estimates. The fixed country-transition effects (φ_{iz}) control for time-invariant country-transition specific characteristics, such as geography, colonial history, or natural resources, and take into account that transitions are inherently different across countries. For example the democratic transition in Argentina in 1983 has different characteristics than the democratic transition in Bolivia in 1982 or the autocratic transition in Korea in 1972.

Our main question is whether democracy has a positive effect on economic growth. Answering this question using a difference-in-difference approach raises several identification issues. First, democratic transitions are unlikely to be exogenous to country-specific growth shocks. In practice transition may occur when growth prospects are good, or growth may increase in anticipation of a regime change. Alternatively, regime change may be more likely in countries with poor performance or may be triggered by a particularly bad economic shock, e.g., the Asia crisis and Suharto's fall, or natural disasters such as drought (Miguel et al. 2004, Barrios et al. 2010, Bruckner and Ciccone 2011). If transitions are endogenous, estimates of their growth consequences using no transition as the counterfactual are biased. The approach we take consists of using different types of transition as counterfactuals to one another, thus reducing the endogeneity bias involved in comparing transition events with no-transition situations. We exploit the fact that all types of transitions encompass some amount of regime change but vary in the degree of democracy achieved and test whether a transition ending with democracy has an additional growth effect holding regime change constant. This is equivalent to testing whether $\beta_D - \beta_{J'} = 0 \forall J' \in \{A, F\}$. If the hypothesis is rejected and the difference is positive, this implies that transitions that succeed in achieving sustained democracy bring higher income growth, which implies that controlling for regime change democracy has indeed a positive effect on income growth.

By conditioning on regime change and comparing the effect of different types of transition, we are able to control for the omitted-variable bias associated with selection into transition. However, it may be that selection into different types of transitions systematically correlates with unobserved country time-varying characteristics. Accounting for this possibility is equivalent to testing within the group of reversed transitions that produce democracy only temporarily whether economic outcomes are superior during the temporary period of democracy as compared with the subsequent period when autocracy returns. This allows us to estimate within-transition the effect of democracy versus autocracy net of the effect of regime change. In some ways, this is the most stringent of our tests.

In addition, if transitions are endogenous to growth performance, the measured growth gains from a straightforward difference-in-difference analysis would reflect a combination of a true transition effect and spurious mean reversion. This is similar to the “Ashenfelter’s dip” critique in the program evaluation literature (Ashenfelter 1978, Chay et al. 2005). In the robustness section 5.1 we account for mean reversion bias by estimating a variant of equation (1), which allows the effect of transition to vary over time. Finally, difference-in-difference estimators exacerbate the downward bias in the standard errors arising from positive residual serial correlation. In all regressions, as per Bertrand et al. (2004), we cluster standard errors at the transition level.¹²

4. EMPIRICAL RESULTS

4.1. Baseline results : Democratic versus Autocratic Transitions

Table 2 reports our main results, comparing the effect of democratic and autocratic transitions on real per capita GDP growth in the medium (7 years) and long run (14 years) using equation (1). All our results refer to the 1960–2011 period. We report least squares estimates and robust standard errors clustered at the transition level (in parentheses). Each column reports the results when we estimate the effect on growth of the two extreme types of regime change together (upper panel) and separately (lower panel). The last row in table 2 reports the coefficient and p-values for an F-test $\beta_D - \beta_A = 0$ on the equality of the β -coefficient on the variables for autocratic and democratic transitions. Columns (1) to (4) focus the analysis on democratic and autocratic transitions that are sustained for at least 7 years and estimate their medium-run effect on growth. If democracy positively impacts growth, we would expect a negative impact of autocratic transitions and a positive impact of democratic transitions. In column 1 we find the opposite: The coefficient on regime change is positive and not significant, the coefficient for democratic transition is positive and not significant, while autocratic transitions have a positive and significant effect,

12. If transitions occur in waves, correlation across countries is a possibility. If this is the case, our standard errors may be underestimated. Clustering at the country level produces similar or slightly stronger results.

Table 2 Baseline results: Medium- and long-run effect on real per capita GDP growth, democratic versus autocratic transitions, 1960–2011

	Sustained 7 years				Sustained 14 years		
	Nonsocialist countries				Nonsocialist countries		
	All countries	All	Excluding former colonies	Balanced sample	All countries	All	Excluding former colonies
Estimating the growth effect of regime change (democratic and autocratic transitions)							
Regime change (A,D)	0.529 (0.404)	0.799** (0.307)	0.825*** (0.316)	0.583* (0.344)	0.841** (0.389)	0.872** (0.340)	0.951*** (0.353)
Observations	5,454	4,678	4,609	3,919	5,868	5,004	4,914
Adjusted R-squared	0.154	0.146	0.149	0.156	0.145	0.143	0.145
Number of countries	158	125	125	121	158	125	124
Number of transitions	61	52	45	46	46	45	32
Decomposing the growth effect of regime change into democratic and autocratic transitions							
Democratic (D)	0.107 (0.467)	0.633* (0.358)	0.633* (0.359)	0.827* (0.439)	0.602 (0.403)	0.827** (0.408)	0.847** (0.409)
Autocratic (A)	1.455** (0.690)	1.106** (0.535)	1.266** (0.583)	0.102 (0.571)	1.511* (0.833)	0.979* (0.537)	1.272** (0.589)
D=A	2.74[0.10]	0.56[0.46]	0.09[0.76]	0.98[0.32]	1.05[0.31]	0.06[0.81]	0.00[0.94]
Observations	5,454	4,678	4,609	3,919	5,868	5,004	4,914
Adjusted R-squared	0.154	0.146	0.149	0.156	0.145	0.143	0.145
Number of countries	158	125	125	121	158	125	124
Number of autocratic transitions	23	22	15	16	16	15	9
Number of democratic transitions	38	30	30	30	30	23	23

Note: The method of estimation is least squares. Robust standard errors (in parentheses) are clustered at the transition level. The dependent variable is the t–1 to t log difference in real per capita GDP (World Development Indicators, 2012). The variable regime change (A,D) is the sum of the two treatment variables, democratic transition (D) and autocratic transition (A). The F-tests of equality of the estimates on the democratic and autocratic transition variables are reported. The constant is not reported. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources: Polity IV Project, Marshall, Gurr, and Jagers, 2011; World Development Indicators, 2012; and authors' calculations.

although the variance is greater and the coefficient is not statistically different from the coefficient for democratic regime change (last row of column 1).

In column 2 we limit the sample to the nonsocialist countries because in the relatively short 7-year period under consideration, the difficult economic transitions in the socialist countries could obscure positive effects of political transition. The results show a positive and significant effect of regime change (autocratic and democratic together) on growth. Both democratic and autocratic transitions are now statistically significant and not statistically different from each other. Regime change, irrespective of direction, is associated with a medium-run growth dividend of about 0.6 to 0.8 percentage point per year.¹³

13. Persson and Tabellini (2009) found an effect of 0.75 percentage point and Rodrik and Wacziarg (2005) an effect of 0.87 percentage point of democratic transition on long-run growth.

In column 3 we control for the fact that a number of the autocratic transitions take place a few years after the end of the colonial period in their countries. One concern is that our estimates are picking up a protracted colonization effect on growth. We repeat the analysis excluding all autocratic transitions that occurred within 7 years of the year that the country gained independence. This includes Singapore in 1968 (independence from the United Kingdom in 1963), Benin in 1965 (independence from France in 1960), Kenya in 1969 (independence from the United Kingdom in 1964), the Democratic Republic of Congo in 1965 (independence from Belgium in 1960), Nigeria in 1966 (independence from the United Kingdom in 1960), and Sierra Leone in 1967 (independence from the United Kingdom in 1961). The results remain similar, with autocratic transitions not significantly different from democratic ones.

Column 4 repeats specification in column 2 using a balanced sample of transitions. The number of transitions with 7 years of growth data available before and after transition is now reduced to 16 autocratic and 30 democratic transitions. Results show a positive effect of regime change, and when we split the coefficient into the specific types, only democratic transitions remain significant, but the coefficients are not significantly different from each other.

Finally in columns 5–7 we repeat the analysis only keeping the sample of autocratic and democratic transitions that are sustained for at least 14 years in order to capture long-run effects. The results show a positive and significant long-run impact of regime change on growth of about 0.75 to 0.85 percentage point per year. In this case when considered separately, autocratic and democratic transitions have a positive and significant effect, and the coefficients are very close in magnitude (column 7).

Table 2 offers robust evidence that regime change irrespective of the direction of change stimulates medium- and long-run growth in nonsocialist countries. In all specifications, we cannot reject the null that autocratic transitions offer the same return as democratic transitions. Moreover, we do not find any evidence that autocratic transitions negatively affect growth, rather the opposite.

4.2. Baseline Results : Democratic, Failed, and Gradual Transitions

Table 3 reports results comparing the long-run (14 years) effect on real per capita GDP growth of democratic and failed transitions. If democracy is good for growth, we would expect transitions that are successful in achieving democracy to yield better economic outcomes than transitions that achieve democracy only temporarily or only at a low level. The last rows in table 3 report the coefficients and p-values for the F-test on the equality of the β -coefficients.

We find that following either type of regime change, long growth is about 1 percentage point higher (column 1). Column 2 reports results for democratic and failed transitions separately. Both types of transitions have significant positive effects, with a higher point estimate on failed transitions, though the coefficients are not significantly different from each other. In column 3, we allow for differences in partial and reversed transitions and find that if anything partial transitions have the strongest positive effects.

Table 3 Baseline results: Long-run effect on real per capita GDP growth, democratic versus failed transitions, 1960–2011

Sample	All countries				Nonsocialist countries	
	(1)	(2)	(3)	(4)	(5)	(6)
Regime change (D,F)	0.887*** (0.303)					
Democratic (D)		0.654* (0.333)	0.654* (0.333)	0.666** (0.333)	0.982*** (0.332)	0.996*** (0.332)
Failed (F)		1.221** (0.478)				
Partial (P)			1.204* (0.620)	1.216* (0.620)	1.555** (0.618)	1.568** (0.617)
Reversed (R)			1.257* (0.663)		0.945 (0.652)	
Reversed-autocratic period (AP)				2.701*** (0.560)		2.427*** (0.486)
Reversed-democratic period (DP)				-0.433 (0.809)		-0.789 (0.739)
Observations	5,625	5,625	5,625	5,625	4,770	4,770
Adjusted R-squared	0.152	0.152	0.152	0.153	0.152	0.154
Number of countries	158	158	158	158	125	125
Number of democratic transitions	36	36	36	36	28	28
Number of failed transitions	30	30	30	30	29	29
D = F		1.13[0.29]				
R = P			0.00[0.95]		0.48[0.49]	
AP = DP			19.31[0.00]		33.63[0.00]	

Note: The method of estimation is least squares. Robust standard errors (in parentheses) are clustered at the transition level. The dependent variable is the $t-1$ to t log difference in real per capita GDP (World Development Indicators, 2012). The variable regime change (D,F) is the sum of the two variables, democratic (D) and failed (F). The variable failed (F) is the sum of the two variables, reversed (R) and partial (P). The variable reversed (R) is the sum of the two variables, reversed-autocratic period (AP) and reversed-democratic period (DP). The F-tests of equality of the estimates on the democratic (D) and failed (F), partial (P) and reversed (R), reversed-AP and reversed-DP variables are reported. All models include country-transition-specific and year-specific constants (coefficients not reported). *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources: Polity IV Project, Marshall, Gurr, and Jagers, 2011; World Development Indicators, 2012; and authors' calculations.

In column 4, we exploit the fact that in reversed transitions the new democratic regime in place is not sustained and the country reverts back to autocracy, and we see whether the period of democratic rule is associated with better growth. Specifically, for reversed transitions we distinguish two sub-periods in the post-transition period and define two additional indicator variables. First we define the dummy

variable democratic-period that equals 1 in the year of a reversed transition and the years following the transition when the country is democratic (polity score > 0) and before it falls back to autocracy, 0 otherwise.¹⁴ Second, we define the dummy variable autocratic-period that equals 1 in the years following a reversed transition when the country has reverted back to autocracy (polity score < 0), 0 otherwise. The democratic-period dummy allows us to estimate the interim effect of democracy in cases of reversed transition, while the autocratic-period dummy captures the effect on growth of reversed transitions net of the effect of democracy in the first few democratic years after transition and prior to reversal. If democracy promotes growth, we expect to see better outcomes during the democratic period than the autocratic period. We find that growth effects only accrue in the long run, after the country has reverted to autocracy, suggesting democracy is not responsible for the positive coefficient found in column 3. Columns 5–6 repeat results for the nonsocialist countries, and the results are robust. Overall, they suggest a positive long-run effect of regime change but one that is statistically invariant to the level of democracy achieved.

A potential concern in table 3 is that the failed transition could perform somewhat better because the transition process is less disruptive. In table 4 we compare the long-run (14 years) consequences on growth of failed transitions with those of gradual transitions. The definitional distinction between gradual transitions and partial transitions is that the former eventually achieve and sustain full democracy, while partial transitions remain only weakly democratic throughout the period. Thus both types of transitions offer similar average levels of democracy in the period immediately following the transition. The only difference is that gradual transitions eventually reach democracy, while partial transitions do not. In addition, in both types, the transition date is defined as the first time the index is above the democratic threshold of 0. If democracy is responsible for growth, then gradual transitions should look similar or better than partial transitions.

The results in table 4 show no evidence that gradual transitions stimulate growth, while partial transitions are associated with a long-run economic gain of about 1 to 1.4 percentage point. The coefficient on the gradual dummy is always negative and significantly different than the coefficient on partial transitions. We reject the null that the growth effect of gradual transitions is equivalent to that of partial transitions, $\beta_G - \beta_P = 0$. A potential explanation is that gradual transitions may be associated with a longer period of uncertainty about the direction of change, which keeps investors on the sidelines, waiting for policy predictability and political stability. Alternatively, gradual transitions may involve less regime change in the areas that are important for economic growth. Overall, the results further suggest that the growth dividend is a result of rapid regime change and not democracy.

14. As a robustness check, we define the democratic period as the years following a reversed transition when the country is democratic with a polity score of > 5 instead of 0, and our results remain unchanged.

Table 4 Baseline Results: Long-run effect on real per capita GDP growth, failed versus gradual transitions, 1960–2011

Sample	All countries			Nonsocialist countries		
	(1)	(2)	(3)	(4)	(5)	(6)
Gradual (G)	–0.503 (0.892)	–0.503 (0.893)	–0.491 (0.892)	–0.244 (0.600)	–0.236 (0.601)	–0.222 (0.601)
Failed (F)	1.134** (0.477)			1.265*** (0.477)		
Partial (P)		1.113* (0.622)	1.124* (0.622)		1.460** (0.622)	1.473** (0.622)
Reversed (R)		1.182* (0.653)			0.855 (0.646)	
Reversed-autocratic period (AP)			2.611*** (0.546)			2.321*** (0.476)
Reversed-democratic period (DP)			–0.492 (0.799)			–0.861 (0.734)
Observations	5,625	5,625	5,625	4,770	4,770	4,770
Adjusted R-squared	0.151	0.151	0.152	0.151	0.151	0.153
Number of countries	158	158	158	125	125	125
Number of failed transitions	30	30	30	29	29	29
Number of gradual transitions	12	12	12	9	9	9
F = G	2.77[0.10]			4.23[0.04]		
P = G		2.34[0.13]	2.34[0.13]		4.15[0.04]	4.15[0.04]
R = G		2.39[0.12]			1.62[0.21]	

Note: The method of estimation is least squares. Robust standard errors (in parentheses) are clustered at the transition level. The dependent variable is the $t-1$ to t log difference in real per capita GDP (World Development Indicators, 2012). The F-tests of equality of the estimates on the failed (F) and gradual (G) variables are reported. The variable failed (F) is the sum of the two variables, reversed (R) and partial (P). The variable reversed (R) is the sum of the two variables, reversed-autocratic period (AP) and reversed-democratic period (DP). All models include country-transition-specific and year-specific constants (coefficients not reported). *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources: Polity IV Project, Marshall, Gurr, and Jaggers, 2011; World Development Indicators, 2012; and authors' calculations.

This section has offered the first evidence on the importance of democracy, given a country is undergoing transition. The results provide robust evidence that the direction or intensity of change does not matter significantly; all types of rapid regime change produce higher long-run growth. They also suggest that the pace of transition matters; gradual transition is not associated with the same gains as the other types of regime change.

5. ROBUSTNESS CHECKS

In this section we explore the robustness of our main results of the effect of regime change on long-run growth to a series of tests, allowing for time-varying effects of transitions, including alternative specification and changing the cutoffs in our definitions.

5.1. Mean Reversion Bias

In practice transition may occur when growth prospects are good, or growth may increase in anticipation of a regime change. Regime change may also be more likely in countries with poor performance or may be triggered by a particularly bad economic shock. In this case the coefficients on our transition dummies are biased by spurious mean reversion following transition (Ashenfelter 1978, Chay et al. 2005). We therefore need to control for the period preceding transition, the transition period, and the recovery period. To control for lags or leads of the effect of transitions, we create nonoverlapping dummy variables for different periods around the transition dates.¹⁵ For each type J of transition, democratic failed and gradual, we define five period dummies, J^1 to J^5 . The dummy variable J^1 equals 1 in the fifth, fourth, and third years preceding any transition, and 0 otherwise. The dummy J^1 accounts for possible anticipation effects. If investments were made in anticipation of the collapse of the authoritarian regime, the coefficient on J^1 would be positive. The dummy variable J^2 equals 1 in the two years before the transition and the year of the transition, and 0 otherwise. The dummy variable J^3 equals 1 in the three years following any transition, and 0 otherwise. The dummy variable J^4 equals 1 in the fourth, fifth, and sixth years following any transition, and 0 otherwise. Finally, the dummy variable J^5 equals 1 in the seventh up to the fourteenth year following transition, and 0 otherwise. The dummy variables J^3 , J^4 , and J^5 account for the short-, medium-, and long-run effect of each type of democratic, failed, and gradual transition respectively. We also defined a set of period indicator variables for the regime change variable—defined as the sum of democratic and failed period dummies. Specifically we estimate a variant of equation (1) that allows the effect of transition to vary over time,

$$g_{iz,t} = \sum_J \sum_{k=1}^5 \beta_J^k J_{iz,t}^k + \varphi_{iz} + \varphi_t + \omega_{iz,t} \quad (2)$$

where ω is a disturbance term. For each type of transition, the parameters β_J^k capture the average growth rates in the corresponding years preceding or following the transition start compared to the base period of nondemocratic years before the transition, that is, from the sixth year and backwards. Note that autocratic transitions are excluded from the analysis because there are not enough observations prior to the date of transition.¹⁶ The coefficients on the transition variables in table 3 and table 4 capture the average annual growth during the post-transition period; in table 5 we examine how the growth effects accrue over

15. Elias Papaioannou and Gregoris Siourounis (2008a) also examine the timing of the effect of democratic transition. We follow their split of time period. However, their focus is on full permanent democratic transitions, the rough equivalent of our democratic transitions.

16. To estimate the effect of transitions over time, we need a minimum of 10 years—5 years of data in the base period of nondemocratic years before the transition in addition to the 5 years of data in the pre-transition and transition periods—of data prior to the initiation of transition. Only 9 cases of autocratic transition qualify under this criterion.

Table 5 Robustness: Democratic versus failed transitions: Timing of transitions

Sample	All countries	All countries, balanced sample	Nonsocialist countries	Nonsocialist countries, balanced sample
	(1)	(2)	(3)	(4)
Regime changes (D,F)				
T1 [-5,-3]	0.103 (0.434)	0.094 (0.734)	0.051 (0.443)	0.148 (0.790)
T2 [-2,0]	-1.242** (0.580)	-2.416*** (0.840)	-0.768 (0.513)	-1.900*** (0.652)
T3 [1,3]	-0.172 (0.636)	-0.414 (1.032)	0.603 (0.484)	0.477 (0.764)
T4 [4,6]	0.625 (0.477)	0.299 (0.650)	0.771 (0.480)	0.403 (0.663)
T5 [7,14]	1.291*** (0.402)	0.960* (0.521)	1.423*** (0.403)	0.932* (0.539)
Democratic transitions (D)				
D1 [-5,-3]	0.193 (0.610)	0.01 (0.905)	0.187 (0.671)	0.13 (1.011)
D2 [-2,0]	-2.362*** (0.831)	-2.857** (1.092)	-1.468** (0.710)	-1.895** (0.804)
D3 [1,3]	-0.514 (0.908)	-0.398 (1.273)	1.166** (0.551)	1.149* (0.691)
D4 [4,6]	0.139 (0.533)	0.23 (0.664)	0.29 (0.516)	0.391 (0.669)
D5 [7,14]	0.927** (0.426)	1.062* (0.558)	0.882** (0.434)	0.938 (0.597)
Failed transitions (F)				
F1 [-5,-3]	0.05 (0.568)	0.281 (1.240)	-0.028 (0.539)	0.194 (1.225)
F2 [-2,0]	0.169 (0.622)	-1.38 (1.136)	-0.021 (0.650)	-1.898* (1.090)
F3 [1,3]	0.317 (0.786)	-0.433 (1.765)	0.125 (0.744)	-0.875 (1.747)
F4 [4,6]	1.319* (0.744)	0.475 (1.486)	1.323* (0.756)	0.415 (1.467)
F5 [7,14]	1.898*** (0.641)	0.694 (1.102)	2.219*** (0.609)	0.935 (1.083)
Observations	5,625	4,770	5,631	4,776
Adjusted R-squared	0.162	0.157	0.16	0.156
Number of countries	158	125	158	125
Number of democratic transitions	36	28	39	30
Number of failed transitions	30	29	26	25

Note: The method of estimation is least squares. Robust standard errors (in parentheses) are clustered at the transition level. The dependent variable is the t-1 to t log difference in real per capita GDP (World Development Indicators, 2012). The variable regime change (D,F) is the sum of the dummy variables for democratic (D) and failed (F). All models include country-transition-specific and year-specific constants (coefficients not reported). *, **, *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources: Polity IV Project, Marshall, Gurr, and Jagers, 2011; World Development Indicators, 2012; and authors' calculations.

time. Column 1 estimates the timing of the economic effect of democratic, gradual, and failed (partial and reversed together) transitions on the whole sample using equation (2). The upper panel reports the coefficients on the period dummies for regime change (democratic and failed together), and the middle and lower panels report the coefficients on the period dummies for the democratic and failed transitions separately. We do not report estimates of the gradual dummies, as they show few significant results (results are available upon request).

Considering the effect over time of regime change (upper panel), we find that income growth does not statistically vary in anticipation of the collapse of the authoritarian regime. The estimate on the J^2 period variable is negative and statistically significant at the 1 percent level, implying a decrease in annual income growth by 3 percentage points in the years during transition. The estimate on the pulse variables J^3 and J^4 are not significant. The estimate on the J^5 variable is positive and statistically significant at the 10 percent level. Compared to the nondemocratic years prior to any democratic regime change (before year 5) annual growth is on average 1.2 percent higher in the long run. Column 2 uses a balanced sample. In columns 3–4 we repeat the analysis excluding socialist countries from the sample. The long-run effect is robust to excluding socialist countries, though transition costs are higher. The middle and lower panels of table 5 report the coefficients on the period dummies for the democratic and failed transitions. Both types of regime change show robust positive long-run effects and some evidence of costs during transition.

5.2. Alternative Specifications

Table 6 reestimates the effect of democratic and autocratic transitions under alternative specifications. Growth may be triggered by a wide range of factors other than democracy. Columns 1–2 test the sensitivity of our estimates controlling for a vector of time-varying controls including investment, human capital, government spending, and trade openness. Columns 3–4 control for regional dynamics and include region specific time trends. Columns 5–6 check that our results are not driven by poor estimates of growth after or before a transition. We use a balanced sample of transitions. Note that this is a stringent (and unfair) test to the autocratic transitions, as the number of transitions with 14 years of growth data available before and after transition is now reduced to 4 autocratic and 25 democratic transitions. Results show a robust and positive effect of regime change, and when we split the coefficient into the specific types, only democratic transitions remain significant. While the effect of autocratic transitions is never significant, as one would expect given the number of observations, it is similar or larger in magnitude and never statistically different from that of democratic transitions. Finally, in columns 7–8 we restrict the sample to autocratic transitions that are defined using an extreme level of ultimate autocracy. That is the level of the polity score after autocratic transition is below -5 , compared to the $+5$ in the case of

Table 6 Robustness: Democratic versus autocratic transitions: Alternative specifications

Sample	Additional controls		Regional dynamics		Balanced sample		Symmetric definition autocratic	
	All	Nonsocialist	All	Nonsocialist	All	Nonsocialist	All	Nonsocialist
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Regime change (A,D)	0.946** (0.436)	0.744** (0.332)	1.045** (0.453)	0.646* (0.336)	1.187** (0.486)	1.024** (0.419)	0.727* (0.390)	0.755** (0.338)
Observations	5,131	4,462	5,868	5,004	5,021	4,358	5,808	4,944
Adjusted R-squared	0.202	0.19	0.147	0.146	0.148	0.147	0.145	0.144
Number of countries	155	123	158	125	142	116	158	125
Number of transitions	41	34	46	38	29	26	43	35
Democratic (D)	0.71 (0.437)	0.719* (0.391)	0.439 (0.372)	0.562 (0.386)	0.970** (0.457)	1.024** (0.470)	0.608 (0.404)	0.838** (0.408)
Autocratic (A)	1.645 (1.018)	0.813 (0.574)	1.409 (0.864)	0.834 (0.567)	1.009 (0.919)	1.019 (0.714)	1.142 (0.918)	0.506 (0.446)
Observations	5,131	4,462	5,868	5,004	5,021	4,358	5,808	4,944
Adjusted R-squared	0.202	0.19	0.147	0.146	0.148	0.147	0.145	0.144
Number of countries	155	123	158	125	142	116	158	125
Number of autocratic transitions	13	12	16	15	4	4	13	12
Number of democratic transitions	28	22	30	23	25	22	30	23
D = A	0.76[0.39]	0.02[0.89]	1.14[0.29]	0.18[0.68]	0.00[0.97]	0.00[0.99]	0.31[0.58]	0.34[0.56]

Note: The method of estimation is least squares. Robust standard errors (in parentheses) are clustered at the transition level. The dependent variable is the t-1 to t log difference in real per capita GDP (World Development Indicators, 2012). The variable regime change (A,D) is the sum of the two variables, democratic transition (D) and autocratic transition (A). The F-tests of equality of the estimates on the democratic and autocratic transition variables are reported. All models include country-transition-specific and year-specific constants (coefficients not reported). *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources: Polity IV Project, Marshall, Gurr, and Jaggers, 2011; World Development Indicators, 2012; and authors' calculations.

democratic transitions. This excludes from the sample Singapore in 1965, Chad in 1985, and Sierra Leone in 1967. The results remain qualitatively similar.

Table 7 reestimates the effect of democratic, failed, and gradual transitions on income growth controlling for other determinants of growth (columns 1–3), including regional time trends (columns 4–6), and using a balanced sample with growth data available before and after transition (equal to 14 years [columns 7–9]). All of our results remain qualitatively similar.

5.3. Alternative Definitions of Transitions

Table 8 tests the robustness of our results to changes in the coding of transitions. In columns 1–3, we check that our results are not driven by time trends not captured by the global time effects. We estimate a placebo specification, where the initiation of each transition is lagged by 14 years. We take 14 as the relevant threshold given our definition imposes a 7-year window between each episode's initiation. Taking twice this interval ensures we are not simply shifting from one episode to another. If the identification strategy is

Table 7 Robustness: Democratic versus failed transitions: Alternative specifications

Sample	Additional controls			Regional dynamics			Balanced sample		
	All (1)	All (2)	Nonsocialist (3)	All (4)	All (5)	Nonsocialist (6)	All (7)	All (8)	Nonsocialist (9)
Regime change (D,F)	0.848** (0.337)			0.732** (0.310)			1.011** (0.419)		
Democratic (D)		0.597 (0.376)	0.852** (0.333)		0.48 (0.335)	0.777** (0.344)		1.106** (0.470)	1.235** (0.488)
Failed (F)		1.209** (0.552)	1.401** (0.543)		1.097** (0.488)	1.138** (0.508)		0.787 (0.834)	0.855 (0.854)
Gradual (G)	-0.633 (0.836)	-0.64 (0.836)	-0.449 (0.955)	-0.484 (0.907)	-0.496 (0.912)	-0.349 (0.666)	-1.027 (0.997)	-1.026 (0.996)	0.009 (0.935)
Observations	4,944	4,944	4,281	5,625	5,625	4,770	4,191	4,191	3,593
Adjusted R-squared	0.214	0.214	0.204	0.153	0.154	0.155	0.156	0.156	0.16
Number of countries	155	155	123	158	158	125	124	124	100
Number of democratic transitions	34	34	27	36	36	28	21	21	18
Number of failed transitions	28	28	27	30	30	29	9	9	9
Number of gradual transitions	11	11	9	12	12	9	8	8	7
DF = G	2.91[0.09]			1.81[0.18]			3.71[0.06]		
D = F		0.94[0.33]	0.82[0.37]		1.32[0.25]	0.43[0.51]		0.11[0.74]	0.15[0.70]

Note: The method of estimation is least squares. Robust standard errors (in parentheses) are clustered at the transition level. The dependent variable is the $t-1$ to t log difference in real per capita GDP (World Development Indicators, 2012). The variable regime change (D,F) is the sum of the two variables, democratic (D) and failed (F). For each of the following controls—investment, life expectancy, government consumption and trade share—we include a one-year lag of the variable. The coefficients are not reported. All models include country-transition-specific and year-specific constants (coefficients not reported). *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources: Polity IV Project, Marshall, Gurr, and Jaggers, 2011; World Development Indicators, 2012; and authors' calculations.

valid, one should not witness a positive effect on growth at these timings. The point estimates are not statistically significant, implying that our results are driven by the specific events we are focusing on.

The remaining columns in table 8 examine the robustness of our results to changes in the definition of transitions. We alternatively increase or decrease the cutoff level of 5 in the polity score in our definition of democratic, gradual, and failed transitions. Table A in the appendix shows how modifying the threshold affects the classification of transitions. Lowering the cutoff from 5 to 4 increases the number of democratic transitions used in the regression from 36 to 39 and lowers the number of failed transitions, as some failed are now considered democratic at this threshold. In particular, Mozambique in 1994 and Romania in 1990, previously classified as partial and gradual respectively, are now considered democratic transitions. Alternatively, increasing the threshold from 5 to 6 reduces the number of democratic transitions to 24. Columns 1–2 test the sensitivity of our estimates to lowering the cutoff level from 5 to 4. Columns 3–4 test the sensitivity of our estimates to increasing the cutoff level from 5 to 6. The results on democratic and failed transitions, combined or separate, are robust to using different threshold levels.

Table 8 Robustness: Democratic versus failed: Alternative definitions of transitions

Sample	Placebo			Cutoff = Polity score 4			Cutoff = Polity score 6		
	14-year, lagged transition			All	All	Nonsocialist	All	All	Nonsocialist
	All	All	Nonsocialist						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Regime change (D,F)	-0.06 (0.501)			0.707** (0.333)			0.933** (0.379)		
Democratic (D)		-0.081 (0.590)	0.055 (0.622)		0.456 (0.372)	1.070*** (0.335)		0.42 (0.392)	0.915** (0.423)
Failed (F)		-0.027 (0.805)	0.117 (0.794)		1.130** (0.527)	1.309** (0.516)		1.287** (0.526)	1.236*** (0.421)
Gradual (G)	-1.245 (1.139)	-1.245 (1.139)	-1.166 (1.234)	-0.247 (0.891)	-0.259 (0.892)	0.012 (0.571)	0.117 (0.637)	0.109 (0.636)	0.813 (0.502)
Observations	5,065	5,065	4,385	5,631	5,631	4,776	5,626	5,626	4,771
Adjusted R-squared	0.166	0.166	0.162	0.151	0.151	0.152	0.151	0.152	0.152
Number of countries	158	158	125	158	158	125	158	158	125
Number of democratic transitions	24	24	22	39	39	30	24	24	17
Number of failed transitions	14	14	13	26	26	25	38	38	37
Number of gradual transitions	10	10	9	12	12	10	16	16	12
DF = G	0.95[0.33]			1.12[0.29]			1.42[0.23]		
D = F		0.00[0.96]	0.00[0.95]		1.30[0.26]	0.17[0.68]		2.11[0.15]	0.34[0.56]

Note: The method of estimation is least squares. Robust standard errors (in parentheses) are clustered at the transition level. The dependent variable is the t-1 to t log difference in real per capita GDP (World Development Indicators, 2012). The variable regime change (D,F) is the sum of the two variables, democratic (D) and failed (F). All models include country-transition-specific and year-specific constants (coefficients not reported). *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources: Polity IV Project, Marshall, Gurr, and Jagers, 2011; World Development Indicators, 2012; and authors' calculations.

6. CONCLUDING REMARKS

This paper provides robust evidence that the positive growth effect found in the within-country literature on democratization accrues to all types of rapid transitions, as opposed to only democratic transitions.

We build a new data set of political transitions where we classify transitions as autocratic, democratic, and tentative, based on the direction, intensity, and sustainability of the regime change, and disentangle the effect of regime change from that of democracy by using different types of transition as counterfactuals for one another. We thus alleviate an identification problem that has plagued the literature, namely that regime change is itself endogenous to the prior performance of the ousted regime.

We find that a rapid regime change is associated with a growth premium of about 1 percentage point in the long run, irrespective of its direction and the durability of its outcome. This likely reflects the positive effect of removing an inefficient regime whose rule has led to systematic economic mismanagement. Second, we find that lengthy (gradual) transitions to democracy bring no growth premium at all. The uncertainty associated with piecemeal regime change may be detrimental to firms'

activity and investment, hence limiting the speed of economic development. Alternatively, the change in leadership and economic policies may be limited in gradual political transitions, limiting growth effects.

Our results do not imply that democracy has no effect on welfare. There is evidence that democracies do significantly better in areas of human development, freedom of the press, and respect for human rights (Mulligan et al. 2004). Our results, however, suggest that the observed effects of democracy on economic growth found in the previous literature may be due to the removal of a poorly-performing regime, and accompanying economic reforms, rather than to the intrinsic qualities of democracy itself.

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APPENDIX

TABLE A COUNTRIES AND YEARS OF TRANSITIONS

Table A Countries and years of transitions

	Country	Year	Number of years sustained after initiation of transition	Number of transitions	Cutoff = Polity score 4	Cutoff = Polity score 6
(1) Autocratic						
1	Belarus	1996	14+	1		
2	Benin~	1965	14	2		
3	Brazil	1965	14	2		
4	Chad^	1985	14+	1		
5	Chile	1973	14	2		
6	Congo, Democratic Republic of~	1965	14	2		
7	Gambia, The	1994	14+	1		
8	Greece	1967	7	2		
9	Guyana	1980	7	2		
10	Iran, Islamic Republic of	2004	7+	2		
11	Kenya~	1969	14	2		
12	Korea, Republic of	1972	14	2		
13	Lao People's Democratic Republic~*	1975	–	–		
14	Nigeria~	1966	7	3		
15	Pakistan	1999	7+	3		
16	Panama	1968	14	2		
17	Peru	1968	7	2		
18	Philippines	1972	14	2		
19	Sierra Leone~^	1967	14	2		
20	Singapore~^	1965	14+	1		
21	Somalia*^	1969	–	–		
22	Swaziland*	1973	–	–		
23	Uganda*^	1967	–	–		
24	Uganda	1986	14+	1		
25	Uruguay	1972	7	2		
26	Zambia	1972	14	2		
27	Zimbabwe	1987	14+	1		
(2) Democratic						
1	Argentina	1983	14+	2		
2	Bangladesh	1991	14+	1		P
3	Benin	1991	14+	2		G
4	Bolivia	1982	14+	1		
5	Brazil	1985	14+	2		
6	Bulgaria	1990	14+	1		
7	Cape Verde	1991	14+	1		
8	Chile	1989	14+	2		
9	Comoros	2004	7+	2		P

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Table A Countries and years of transitions (continued)

	Country	Year	Number of years sustained after initiation of transition	Number of transitions	Cutoff = Polity score 4	Cutoff = Polity score 6
(2) Democratic						
10	Croatia	2000	7+	1		
11	Cyprus*	1968	–	–		
12	Czech Republic*	1990	–	–		
13	Dominican Republic	1978	14+	1		G
14	Ecuador	1979	14+	2		
15	El Salvador	1984	14+	1		G
16	Estonia	1991	14+	1		G
17	Greece	1975	14+	2		
18	Guyana	1992	14+	2		P
19	Honduras	1982	14+	1		P
20	Hungary	1990	14+	1		
21	Indonesia	1999	7+	1		G
22	Kenya	2002	7+	2		
23	Korea, Republic of	1988	14+	2		G
24	Latvia	1991	14+	1		
25	Lebanon	2005	7+	1		
26	Lithuania*	1991	–	–		
27	Macedonia, FYR (Former Yugoslavia Republic)*	1991	–	–		G
28	Madagascar	1992	14+	1		
29	Malawi	1994	14+	1		P
30	Mali	1992	14+	1		
31	Moldova	1993	14+	1	(1991)	
32	Mongolia	1992	14+	1		
33	Nicaragua	1990	14+	1		G
34	Pakistan	1988	7	3		
35	Panama	1989	14+	2		
36	Peru	1980	7	2		
37	Philippines	1987	14+	2		
38	Poland*	1991	–	–	(1989)	
39	Portugal	1976	14+	1		
40	Senegal	2000	7+	1		
41	Slovak Rep.	1990	14+	1		
42	Slovenia*	1991	–	–		
43	Spain	1978	14+	1	(1977)	
44	Ukraine*	1991	–	–		G
45	Uruguay	1985	14+	2		

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Table A Countries and years of transitions *(continued)*

	Country	Year	Number of years sustained after initiation of transition	Number of transitions	Cutoff = Polity score 4	Cutoff = Polity score 6
(3) Gradual						
1	Albania	1990	14+	1		
2	Burundi	2002	7+	1		P
3	Georgia	1991	14+	1		
4	Ghana	1996	14+	3		
5	Guatemala	1986	14+	2		
6	Guinea-Bissau	1994	14+	1		P
7	Lesotho	1993	14+	1		
8	Liberia	2003	7+	1		P
9	Mexico	1994	14+	1		
10	Paraguay	1989	14+	1		
11	Romania	1990	14+	1	D	
12	Sierra Leone	1996	14+	2		
(4) Failed Reversed						
1	Argentina	1973	7	2		P
2	Armenia*	1991	–	–	G	
3	Ghana	1979	14	3		P
4	Haiti*	1994	–	–	G	
5	Niger	1992	14+	1		
6	Nigeria	1979	14	3		
7	Pakistan	1973	14	3		
8	Pakistan	1988	7	3		
9	Peru	1980	14+	2		
10	Sudan	1986	14+	2		
11	Sudan	1965	14	2		
12	Zambia	1991	14+	2	G	P
(5) Failed Partial						
1	Algeria	2004	7+	1		
2	Burkina Faso	1977	14+	1	R(1978)	
3	Central African Republic	1993	14+	1	R	
4	Comoros	1990	14	2		
5	Congo, Democratic Republic of	2004	7+	2		
6	Congo, Republic of	1992	14+	1	R	
7	Cote d'Ivoire	2000	7+	1		
8	Djibouti	1999	7+	1		
9	Ecuador	1968	7	2	R	
10	Ethiopia	1993	14+	1		

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Table A Countries and years of transitions (*continued*)

	Country	Year	Number of years sustained after initiation of transition	Number of transitions	Cutoff = Polity score 4	Cutoff = Polity score 6
(5) Failed Partial						
11	Ghana	1970	7	3		
12	Guatemala	1966	14	2		
13	Haiti	2005	7+	1	dropped	
14	Iran, Islamic Republic of	1997	7	2		
15	Kyrgyz Republic	2005	7+	1		
16	Mozambique	1994	14+	1	D	
17	Nepal	1990	14+	1	R	
18	Nigeria	1999	7+	3		
19	Russian Federation*	1992	-	-		
20	Suriname	1990	14+	2	D(1991)	
21	Thailand	1969	14+	1		
22	Uganda*	1980	-	-		

* Marks transitions for which income growth data is not available. Those episodes are excluded from the analysis.

~ Marks autocratic transitions that occurred seven years or less after the country gained independence.

^ Marks autocratic transitions that do not reach a level of autocracy below -5 after transition.

+ Indicates that the transition is sustained until the end of the sample period.

Note: The year of transition and number of years the new regime is sustained are reported next to the country. Countries may experience several transitions, and each transition is separate by at least a 7-year gap. Countries that experienced several failed transitions include Ghana in 1970 and 1979, Haiti in 1994 and 2005, Nigeria in 1979 and 1999, Pakistan in 1973 and 1988, and Sudan in 1965 and 1986. Argentina in 1973 and 1983 experienced a failed and then a democratic transition. The last two columns indicate changes that occur when the definition threshold changes from 5 to 4 or 5 to 6. G: gradual; D: democratic; R: reversed; P: partial.

Source: Polity IV Project, Marshall, Gurr, and Jagers, 2011; and authors' calculations.

TABLE B VARIABLES: DEFINITIONS AND SOURCES

Table B Variables: Definitions and sources

Variable	Description	Source
Polity2	The combined Polity score is the difference between the democracy and autocracy indicator. This is an additive 21-point scale (-10;10).	Polity IV Project, 2012
GDPpc (log)	Natural logarithm of real GDP per capita based on purchasing power parity (PPP). Data are in constant 2005 international dollars.	World Development Indicators, 2012
GDPpc growth	Real per capita GDP growth is defined as the annual logarithmic change of real per capita GDP from t-1 to t. Data are in constant 2000 dollars.	World Development Indicators, 2012
investment	Gross fixed capital formation (percent of GDP)	World Development Indicators, 2012
govt consump	General government final consumption expenditure (percent of GDP)	World Development Indicators, 2012
trade openness	Export+Import as a share of GDP (percent)	World Development Indicators, 2012
life expectancy	Natural logarithm of the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same.	World Development Indicators, 2012
Transition dummy variables^a		
regime change (A,D)	Indicator variable that equals 1 in the transition year and the T (7 or 14) years after any autocratic and democratic transition, 0 otherwise.	
autocratic transition (A)	Indicator variable that equals 1 in the transition year and the T (7 or 14) years after of any autocratic transition, 0 otherwise.	
democratic transition (D)	Indicator variable that equals 1 in the transition year and the T (7 or 14) years after of any democratic transition, 0 otherwise. Democratic transitions include transitions that are sustained as democracies for at least T years.	
regime change (D,F)	Indicator variable that equals 1 in the transition year and subsequent years after any democratic or failed transition, 0 otherwise.	
Gradual (G)	Indicator variable that equals 1 in the transition year and subsequent years after any gradual transition, 0 otherwise.	
failed (R,P)	Indicator variable that equals 1 in the transition year and subsequent years after any failed transition, 0 otherwise. Failed transitions include reversed and partial transitions.	
reversed (R)	Indicator variable that equals 1 in the transition year and subsequent years after any reversed transition, 0 otherwise. The reversed dummy is the sum of the reversed democratic-period and reversed autocratic-period dummies.	
partial (P)	Indicator variable that equals 1 in the transition year and subsequent years after any partial transition, 0 otherwise.	
R-autocratic period (AP)	Indicator variable that equals 1 in the years following a reversed transition when the country is democratic (Polity score > 0) and before it reverts back to autocracy, 0 otherwise.	
R-democratic period (DP)	Indicator variable that equals 1 in the years following a reversed transition when the country has reverted back to autocracy (Polity score <= 0), 0 otherwise.	

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Table B Variables: Definitions and sources (continued)

Variable	Description	Source
Timing of transitions^b		
T1	Indicator variable that equals 1 on the fifth, fourth, and third years preceding any democratic and failed transition and 0 otherwise.	
T2	Indicator variable that takes on a value of 1 in the second, first preceding years and the year of democratic and failed transition and 0 otherwise.	
T3	Indicator variable that equals 1 in the three years following any democratic and failed transition and 0 otherwise	
Variable	Description	Source
T4	Indicator variable that equals 1 in the fourth, fifth, and sixth years following any democratic and failed transition and 0 otherwise.	
T5	Indicator variable that equals 1 in the sixth and subsequent years following any democratic and failed transition and 0 otherwise.	

a. For countries that experience multiple transitions over the sample period, the coding of the dummy for each transition event includes only the relevant years for the particular transition. Specifically, an early transition excludes a 3-year window before the next transition and all subsequent years—a final transition excludes a 3-year window in the years following the prior transition. This helps identify growth effects of each particular transition and limits contamination from previous or subsequent episodes.

b. Timing transitions are defined similarly for each type of democratic transition, gradual and failed transitions (reversed and partial). Note that autocratic transitions are excluded from the analysis because there are not enough observations prior to the date of transition. To estimate the effect of transitions over time, we need a minimum of 10 years—5 years of data in the base period of non-democratic years before the transition in addition to the 5 years of data in the pre-transitions and transition periods—of data prior to the initiation of transition. Only 9 cases of autocratic transition qualify under this criterion.

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