DEMOCRACY VERSUS DICTATORSHIP? THE POLITICAL DETERMINANTS OF GROWTH EPISODES

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Abstract: Whether democracy causes economic growth has been a matter of theoretical and empirical debate. We argue that looking at the average effect of democracy on long run growth ignores the heterogeneity of growth experiences among authoritarian regimes relative to democratic regimes. Furthermore, the emphasis on long-run growth is not compatible with the stylised facts of economic growth in developing countries, which is characterized by frequent shifts in growth regimes from stagnant or declining growth to accelerations in growth and back again to decelerating growth. We examine the political determinants of the magnitude of growth in accelerations and deceleration episodes for 125 countries for 1950-2010. We find that the effect of the political regime on growth is asymmetric across accelerations and decelerations and that democracies do not necessarily outperform autocracies in a growth acceleration episode, though they are likely to prevent large growth collapses. We also highlight the importance of the type of autocracy in understanding the effects of regime type on growth.

Keywords: Political institutions, economic growth, growth episodes, democracy, autocracy.

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I. INTRODUCTION

Whether democracy causes economic growth has been a matter of theoretical and empirical debate. A large literature has examined the relationship between democracy and economic growth, without reaching any firm conclusions. From a theoretical perspective, strong economic growth is possible both under autocracies and democracies. Positive economic growth may occur in autocracies if the autocrat is a "stationary bandit (that) has an encompassing interest in the territory he controls and accordingly provides domestic order and other public goods" (Olson 1993, p. 569). A leader in a democracy may also have a similar interest in providing law and order, and other public goods (Saint-Paul and Verdier 1993, Benabou 1996, Lizzeri and Persico 2004). Democracy can also provide a natural check to the power of kleptocratic leaders, reduce social conflict and prevent powerful political groups to monopolise economic opportunities (Acemoglu and Robinson 2012).

Autocratic leaders are also likely to have an adverse effect on growth, if the autocrat has a sufficiently short time horizon, so it would be "his interest to confiscate the property of his subjects, to abrogate any contracts he has signed in borrowing money from them, and generally to ignore the long-run economic consequences of his choices" (Olson 1993 p. 572). At the same time, democratisation may hurt economic growth if this leads to distortionary redistribution (Alesina and Rodrik 1994, Persson and Tabellini 1994). In addition, interest groups politics are more prevalent in democracies, and their presence can lead to stagnation (Olson 1982).

The large empirical literature that has studied the democracy-growth relationship has also not found an unambiguous result (Doucouliagos and Ulubasoglu 2008). In one of the early empirical contributions to this literature, Barro (1996) found that the overall effect of democracy on growth is weakly negative using repeated cross-sections for 84 countries. A similar finding is obtained by Tavares and Wacziarg (2001), also with cross-sectional data. On the other hand, Rodrik and Wacziarg (2005) and Persson and Tabellini (2007) find a positive effect, using panel data. Alesina and and Tabellini (2010) find that the cumulative

number of years that a country spends in democracy has a positive effect on economic growth. More recently, Acemoglu et al. (2014) find a sizeable and robust effect of democracy on economic growth using annual panel data and generalised method of moment estimators for 175 countries for 1960-2010. Their estimates suggest that a country that switches from non-democracy to democracy achieves an increase in GDP per capita of about 20 per cent in the next 30 years, a magnitude of income gain which is not particularly large suggesting that the effect of democracy in increasing per capita incomes is quite muted.

The empirical literature on the effects of political regimes on growth suffers from two important limitations. Firstly, much of the literature focuses on the effect of the political regime on long-run growth. However, such a focus on long-run growth is not consistent with the stylised facts of growth, where long-run average growth rates hide distinct medium term episodes of successful growth and growth failures (Jones and Olken 2008).[1] As a recent literature on the empirics of growth highlights, economic growth in developing countries is characterized by 'boom and bust' growth, with frequent shifts in growth regimes from stagnant or declining growth to accelerations in growth and back again to decelerating growth (Easterly et al. 1993, Pritchett 2000, Rodrik 1999, Hausmann et al. 2005 2006, Arbache and Page 2007, Jones and Olken 2008, Aizenman and Spiegel 2010). Once we view economic growth as an episodic phenomenon, it is not clear how political institutions may be related to the large income gains and losses that we observe in growth acceleration and deceleration episodes.

A second limitation of the literature on the relationship between political institutions and growth is that it does not take into account that growth outcomes in autocracies tend to be more heterogenous than in democracies with examples of both large growth successes and growth failures in autocracies as compared to democracies (Easterly 2011, Jones and Olken 2005). As Jones and Olken (2005) note, "democracies may be able to prevent the disastrous economic policies of Robert Mugabe in Zimbabwe or Samora Michel in Mozambigue; however, they might also have constrained the successful economic policies of Lee-Kwan

[1] Furthermore, as Acemoglu et al. (2008) note, the positive association between democracy and long-run economic development may be driven by historical factors that shaped the divergent political and economic paths of different societies.

Yew in Singapore or Deng Xiaoping in China" (p. 862). This suggests that focusing on the *average* effect of democracy on growth, as the previous empirical literature has attempted to do, may be misleading, as some types of autocracies are more likely to lead to more growth success than other types of autocracies. For example, autocracies where the leadership has long-term time horizons are likely to enact growth-oriented policies than democracies where the leader has strong constraints on his executive power which prevents him for implementing growth-oriented reforms (Clague et al. 1996, Charron and La Puente 2011). In contrast, autocrats with short-term time horizons are likely to adopt policies that are inimical to growth.

In this paper, we attempt to address these two limitations in the empirical literature on the relationship between the political regime and economic growth. Firstly, instead of focusing on long-run growth, we study the political determinants of growth episodes. In particular, we examine whether the type of political regime has a causal effect on the income gains and losses that we observe in growth acceleration and deceleration episodes. We hypothesise that the effects of political institutions are asymmetrical across growth acceleration and growth deceleration episodes – while democracies are unlikely to outperform autocracies in growth acceleration episodes, they are likely to lead to larger income losses as compared to autocracies in growth deceleration episodes.

Secondly, drawing from the literature that argues that party based autocracies may have attributes that are likely to be more conducive to growth than other types of autocracies (Cheibub et al. 2010, Gelhbach and Keefer 2011), we study whether the heterogeneous growth outcomes that are associated with autocracies are related to the type of autocracy that is ruling the country at the onset of a growth episode. We differentiate between party based autocracies on one hand and personalised, monarchist and military based autocracies on the other. We hypothesise that party-based autocracies are likely to yield a larger magnitude of growth in a growth episode as compared to other types of autocracies.

Our unit of analysis is a growth episode, which are identified by discrete breaks in the country's rate of economic growth. A large literature has attempted to identify breaks in

growth rates using subjective rule based (filter based) or statistical methods. We follow Kar et al. (2013), who provide an unified approach to identifying multiple breaks in growth rates, combining filter-based and statistical methods. Following this approach, we obtain 314 growth episodes for 125 countries from 1950 to 2010 with comparable Penn World Tables GDP per capita data.

The dependent variable in our empirical analysis is the magnitude of growth in the episode (which we define as the "episode magnitude"), which is the product of the actual growth rate in the episode relative to counter-factuals and the duration of the episode. In this paper, we propose a procedure for estimating episode magnitude that takes into account the actual growth dynamics that we observe in the time-series data on GDP per capita. Episode magnitude of growth in any particular episode will be higher, the higher the duration of the episode, or the higher the actual growth rate as compared to a counter-factual growth rate.

Next we estimate the effects of the political regime on the episode magnitude. We find clear evidence that democratic regimes are more likely to yield higher magnitudes of growth. However, differentiating between growth acceleration and growth deceleration episodes, we find that there is no discernible difference between democracies and autocracies in causing larger growth acceleration episode. Instead, democracies have a significant effect in preventing large growth collapses as compared to autocracies. This finding is in accordance with the theoretical literature which suggests that we should not expect any performance difference between autocracies ruled by leaders with long-term time horizons and democracies. On the other hand, democracies prevent the worst excesses of a predatory leader (as such a leader is likely to be voted out of office) as compared to autocracies where there are no checks on the predatory power of a dictator. Our results suggest that in a growth episode framework, the effect of the political regime on growth is asymmetric across accelerations and decelerations and that while democracies do not necessarily outperform autocracies in a growth acceleration episode, they are likely to prevent large growth collapses as compared to autocracies.

We then disaggregate authoritarian regimes by type of regime, and show that party-based authoritarian regimes outperform personalist, military based and monarchic authoritarian

regimes on their effects on growth in such episodes. On the other hand, there is no discernible effect of the type of autocracy on episode magnitude in a growth deceleration episode. Again, our results are in accord with the theoretical literature which highlights the importance of the type of autocracy in understanding the effects of regime type on growth.

The rest of the paper is in six sections. The next section sets out our procedure for estimating the episode magnitude of growth. Section III discusses the theoretical literature and hypothesises on the relationship between political institutions and episode magnitude of growth. Section IV presents the empirical strategy and Section IV the data and descriptives. Section VI presents the results. Section VII concludes.

II. Identifying Growth Episodes and Estimating Episode Magnitudes

An episode-based analysis of growth is different from the Barro-type growth regressions or other standard regressions of long run growth in two different ways. The first difference is that in standard regressions, the period over which growth is measured is decided in an ad hoc manner (say a decade) while episode-based approaches have to precisely define how to identify the length of an episode. The second difference is that while average growth rates are a suitable measure of the impact of growth in the standard regressions, they are not so in episode-based approaches, as the duration of episodes (which vary widely) is as important as the growth rate in this approach. In this section, we describe previous work that suggests a procedure to identify growth episodes (Kar et. al. 2013) and introduces the concept of 'episode-magnitude' that we have defined as a measure of the impact of a growth episode (Pritchett et. al. 2013). This measure combines in an intuitive way the impact of a change in the growth rate due to the episode, and the duration of the episode. Thus for example, an acceleration to a modest growth rate which is sustained over decades may have a larger episode-magnitude than a high but short-lived burst of growth.

Identifying Growth Episodes

Moving away from explaining long-run growth averages to explaining transitions between growth regimes necessitates the knowledge of the timing of the breaks in economic growth. Following Pritchett (2000), a set of recent studies attempted to identify breaks in growth rates of GDP per capita for countries with comparable income data. Two distinct approaches have been developed by this literature. The first is a 'filter-based' approach that identifies

growth breaks on the basis of subjectively defined rules. Using this approach, Hausmann et al. (2005) studies breaks that involve growth accelerations, Hausmann et al. (2006) studies growth collapses and Aizenman and Spiegel (2010) studies takeoffs - periods of sustained high growth following periods of stagnation. The second approach is based on statistical structural break tests that uses estimation and testing procedures to identify growth breaks in terms of statistically significant changes in (average) growth rates. The studies that have adopted the 'statistical' approach have used the Bai-Perron (BP) methodology (1998) which locates and tests for multiple growth breaks within a time-series framework (Jones and Olken 2008).

Both approaches have serious shortcomings that call for a better alternative. The limitation of the filter-based approach is well known – the use of filters pre-determined by the researcher is ad hoc, and leads to a lack of consistency in the identification of breaks across papers that use the filter-based approach. On the other hand, a significant shortcoming with the statistical approach is that it is limited by the low power of the Bai-Perron test, which leads to the rejection of true breaks which are suggested by the behavior of the underlying GDP per capita series (Berg et al. 2012).

Kar et al. (2013) propose an approach that provides a unified framework for identifying breaks in economic growth drawing from filter-based and statistical approaches. They use a procedure for identifying structural breaks in economic growth that uses of the Bai-Perron (BP, 1998) procedure of maximizing the F-statistic to identify *candidate* years for structural breaks in growth with thresholds on the magnitude of the shift to determine which are actual breaks (see Kar et al 2013). This procedure involves the best fit of the BP method to the data in the first stage, and the application of a filter to the breaks identified in the first stage in the second stage. The magnitude filter was that the absolute value of the change in the growth rate after a BP potential break had to be (a) 2 percentage points if it was the first break, (b) 3 percentage points if the potential break was of the opposite sign of the previous break (an acceleration that followed a deceleration had to have accelerated growth by more than 3 ppa to qualify as a break) and (c) 1 percentage point if the BP potential break was of the same sign as the previous break, so if BP identified an acceleration that directly followed an acceleration (or deceleration that followed a previous deceleration) the magnitude had

to be larger than 1 ppa to qualify as a break. To estimate potential breaks, we assumed that a "growth regime" lasts a minimum of 8 years (as in Berg et al (2012)). The use of shorter periods (e.g. 3 or 5 years) risk conflation with "business cycle fluctuations" or truly "short run" shocks (e.g. droughts). Longer periods (e.g. 10 or 12 years) reduce the number of potential breaks.[2] Application of this procedure to the PWT7.1 data for 125 countries[3] for 1950-2010 identifies 314 structural breaks in growth, with some countries having no breaks (e.g. USA, France, Australia) and others having four breaks (e.g. Argentina, Zambia). Appendix A in Kar et. al. (2013) provides a list of all 314 breaks identified by country and year of break.

Estimating the Episode-Magnitude of Growth Accelerations and Decelerations

The calculation of episode-magnitudes for growth episodes is discussed in detail in Pritchett et. al. (2013). In this section we summarize this approach. We define the episode-magnitude as the magnitude of the gain (or loss) in per capita income by the end of the episode, as a result of the growth in the episode. Equivalently, it is the product of (i) the additional growth during the episode and (ii) the duration of the episode. The additional growth during the episode is the difference between the actual growth rate during the episode, and a predicted counter-factual growth rate of the economy, had it not transitioned to this particular episode.

How do we predict this counter-factual growth rate? One simple (although naive) prediction is that the growth rate would be what it was in the last episode (no change). This prediction however, ignores a very robust 'stylized fact' about medium term growth rates, i.e., the tendency of these growth rates to 'regress to the mean'. Like other volatile variables like

[2]The length of the output data series that is available in the Penn World Tables vary from country to country. This implies that we need to specify a maximum number of candidate breaks for each country depending on the length of the data series available. We postulate that a country with: i) Forty years of data (only since 1970), can have a maximum of two breaks; ii) More than forty years and up to fifty-five years (data since 1955), can have a maximum of three breaks; iii) More than fifty-five years (before 1955), can have a maximum of four breaks.

[3] From the PWT7.1 data we eliminated all countries that had very small populations (less than 700,000 in 1980) and those that did not have data since 1970 (which eliminated many former Soviet sphere countries and some oil countries like Kuwait and Saudi Arabia).

returns on financial investments, medium term growth rates have been shown to have very low persistence, and hence for example, high growth in the current period increases the possibility of lower growth in the future (Easterly et. al 1993, Pritchett and Summers 2014). In terms of growth episodes, this implies that a predicted counter-factual growth rate can do much better than a "no change" assumption, by adopting some version of regression to mean.

There is another important reason why regression to mean needs to be incorporated in a definition of episode-magnitudes. It should be noted that if there is a tendency of growth rates to regress to the mean, then it is a statistical phenomenon which is exhibited by many other variables. It is not causal in the sense that the reversal of growth rates in any episode for any particular country due to this tendency, is not attributable to changes in the determinants of growth during that episode. Since our interest in defining an episode-magnitude is to subsequently relate it to the underlying determinants of growth, our definition of this variable needs to remove the part that is due to this statistical phenomenon, leaving only that part of the variation in the growth outcome that can be explained by underlying factors. This implies that the measure of the success (or failure) of a growth episode has to be "over and above" its tendency to regress to the mean.

Based on these considerations, we propose three predicted “counter-factual” growth rates, i.e., (a) the growth rate in the previous episode reflecting the idea of "no regression to mean", (b) the world average growth rate during the episode reflecting the idea of "complete regression to mean" and (c) a predicted growth rate based on the idea of “partial regression to mean”. The “partial regression to mean” growth rate uses a regression for each country/episode to allow “predicted” growth to depend on a country’s initial GDP per capita, the episode period specific world average growth and a flexibly specified regression to the mean.

Suppose we have a structural break in growth in year *t* that ends a previous growth episode. Also suppose the growth in the previous episode was g_{before} that lasted for N_b years and the growth in the current episode is g_{ep} and this episode lasts N_{ep} years. We define the episode-magnitude of the current growth episode (where F denotes the episode) as the difference in logs between its actual GDP per capita (GDPPC) in year t+ N_{ep}, and its counter-factual level. If natural log of GDPPC is *y* then the equation is:

$$1)\ Episode\ Magnitude_F = y_{t+N_{ep}}^{Actual} - y_{t+N_{ep}}^{Counter\ factual}$$

By definition, the right hand side of equation 1 is nothing but the product of the actual growth rate during the episode (relative to the counterfactual) and the duration of the episode. This definition of episode-magnitude thus fulfils our criteria for a measure of the impact of a growth episode. Let us now formalize each of the three counter-factuals discussed above.

"No Regression to Mean" (NRM): Counter-factual growth continues at pre-break levels. This assumes there is zero regression to the mean and the counter-factual for growth during the episode was the pre-break growth rate.[4] In this case the magnitude of the total gain/loss from the episode is:

$$2)\ Episode\ Magnitude_F^{No\ Change} = (\ g_{ep} - g_{before}) * N_{ep}$$

"Complete regression to mean": Counter-factual growth during the episode is world average (WA) growth during the episode. Complete regression to the mean assumes the

[4] The NRM growth rate is the coefficient from an OLS regression of ln(GDPPC) on a time trend over the pre-break period.

growth rate during the episode would have been the world average growth during the same period.[5]

$$3)\ Episode\ Magnitude_F^{World\ Average} = (\ g_{ep} - g_{World\ Average_{t,t+N_{ep}}}) * N_{ep}$$

"Partial regression to mean" (PRM): Counter-factual growth during the episode is predicted from past growth. This counter-factual growth (denoted by g_{PRM}) is the prediction from a country/episode specific regression of growth for all countries j other than the country with the break on a constant plus initial GDP per capita plus previous growth. We use a spline to allow the coefficient on previous growth to be different whether the country's growth rate before the episode was higher or lower than the world average.

$$4)\ g_{ep}^{j} = \alpha^{ep} + \beta_{below}^{ep} * c^{j} * (g_{before}^{j} - g_{before}^{world\ average}) + \beta_{above}^{ep} * d^{j} * \left(g_{before}^{j} - g_{before}^{world\ average}\right) + \gamma * y_t^{j} + \varepsilon^{j}$$

This functional form for the counter-factual growth allows for four things: (1) the constant α^{ep} allows the world average growth rate to vary over time and be specific to the period of the episode to accommodate a global "business cycle"; (2) regression to the mean is period specific; (3) regression to the mean depends on previous growth (as recoveries from negative/slow growth make have different dynamics that the slowing of accelerations), with the persistence coefficients, β_{below}^{ep} and β_{above}^{ep} capturing regression to the mean, if previous growth was below and above the previous world average growth rate respectively (with c^j =1 and d^j = 1 if the previous growth rate of the country in question was lower and higher than the previous world average growth rate respectively, 0 otherwise,); (4) growth to depend on the initial level of income, given by

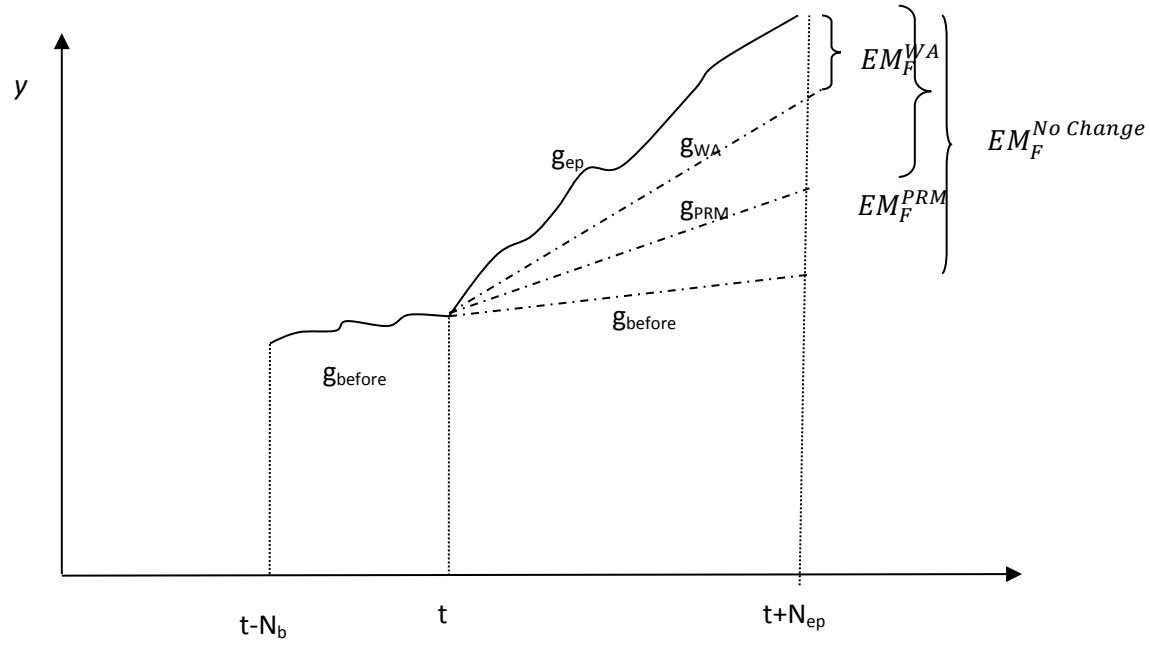
[5] The world average growth rate is the average of the growth rates of all countries minus the country in question for the period of the growth episode.

the coefficient γ (without conditioning variables this is *not* estimating "conditional convergence")[6]. The error term of the regression is given by ε^j.

The episode-magnitude of a growth episode, using the "Partial regression to mean" as the counter-factual growth rate, is given by:

$$5)\ Episode\ Magnitude_F^{PRM} = (\ g_{ep} - g_{PRM}) * N_{ep}$$

Figure 1: Episode Magnitude of a growth episode based on three counter-factuals



[6] For the period from the beginning of the data to the first growth break the PRM growth rate is just a regression of growth on the natural log level of initial output.

Figure 1 illustrates the estimates of the episode magnitude for the three counter-factuals for the case of an acceleration from low growth to high growth. In this (hypothetical) case the “no regression to mean” counter-factual implies a very large magnitude, the “complete regression to mean” counter-factual a small magnitude (as the post-acceleration growth is not much higher than the world average). The "partial regression to mean" counter-factual will essentially be a regression determined weighted average of the two and hence will tend to be the two extremes. When using the "Complete regression to mean" or "Partial regression to mean" counter-factual a growth acceleration could have a negative magnitude (or a growth deceleration a positive magnitude).

We have estimated the episode-magnitude for all 314 episodes based on the three counter-factual growth rates and these are reported in Pritchett et. al (2013) (Appendix 1). For our empirical exercises however, we will be using the two episode-magnitudes based on the idea of regression to mean. Figure 2 gives a kernel density estimate of these two measures, representing the underlying statistical distribution for these variables. The figure on the left hand side of the panel represents episode-magnitudes where the counter-factual is the world average growth rate (Complete Regression to Mean). The figure on the right hand side of the panel shows episode-magnitudes for which the predicted counter-factual reflects Partial Regression to Mean. The two figures are significantly similar to each other, having a central tendency that is close to zero, and most of the density symmetrically distributed between -1 and 1.

Figure 2: Distribution of Episode Magnitudes

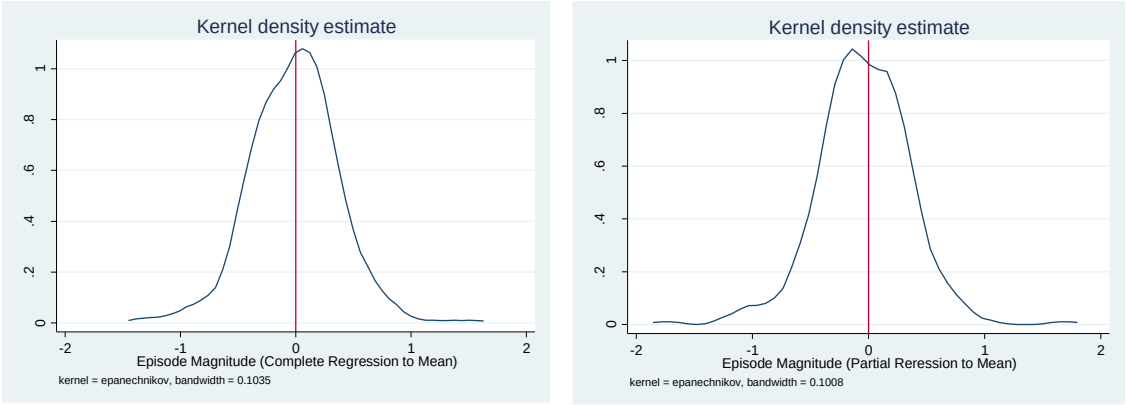


Table 1 summarizes the regressions for calculating the "partial regression to the mean" growth rate. The regression constant, not surprisingly, shows substantial variability over time, as the "predicted" growth rate was positive from 1958 (the first possible growth break as spells have to be at least 8 years) to 1975, negative from 1975 to 1995 and then strongly positive from 1995 to 2002 (by construction the last growth break) as there was exceptionally strong growth.

The spline shows strong, and modestly asymmetric, regression to the mean. Countries with below world median growth show almost no persistence—the average coefficient on previous growth is only 0.175 while those with above average growth tended to have more persistence—but still show strong regression to the mean. Since each country/episode regression is for different periods of "before" and "after" we adjust to a "standard" of the persistence coefficient for an episode 10 years in duration, starting after an episode of 10 years duration in 1980. We see the asymmetry is, if anything, stronger with very near zero persistence of slow growth (.12) and substantial (but far from full) persistence of 0.388 for rapid growth.

Table 1: Summary of the 314 country/episode specific regressions used to compute "partial regression to the mean" growth rates					
		Regression constant	Coefficient on level of GDP per capita at beginning of episode	Persistence coefficient	
				(previous growth below world median)	(previous growth above world median)
Average		0.77	0.001	0.171	0.338
"Standardized" persistence (impact of past growth on predicted growth) of an episode beginning in 1980, following an episode of 10 years and lasting 10 years				0.125	0.388
Std. Deviation		3.81%	0.0038	0.348	0.319
Before	1975	1.16%			
Between	1975 and 1995	-1.25%			
After	1995	7.37%			
Source: see Pritchett et al. (2013).					

III. THE RELATIONSHIP BETWEEN POLITICAL INSTITUTIONS AND EPISODE MAGNITUDE OF GROWTH

What would be our theoretical priors in understanding the effects of political institutions on the magnitude of growth in growth episodes? Consider two types of autocrats, one a leader with a long-term vision and a commitment to enact institutional reforms and policies that are likely to be growth enhancing (such as Deng Xiaoping in China).[7] The second type of leader has a short-term vision (perhaps because he is in an unstable political environment where he may lose power), and engages in high levels of predation (such as Mugabe in Zimbabwe) (Clague et al. 1996). In an autocratic regime, both types of leaders have limited checks on their power to engage in growth-enhancing or growth-limiting policies (Olsen

[7] As Londegran and Poole (1990) note, even authoritarian governments have powerful incentives to promote growth, not out of concern for the welfare of their citizens but because poor economic performance may lead to their removal by force.

1993).[8] In the first case, a large episode of growth acceleration is likely to result, while in the second case, there is a likelihood of a growth collapse. In contrast, a leader in a democracy has strong constraints on his power with a large number of veto players in the political system (North and Weingast 1989). This does not allow him to enact growth –oriented policies with the same degree of freedom as the growth-oriented autocrat. Moreover, for a leader in a democracy, the long-term benefits of growth oriented policies and reforms need to be balanced against the possible repercussions that such policies may have for the leader politically, if these policies and reforms are seen as being unpopular among the electorate or if the reforms lead to diminution of the rents that vested interests obtain from the prevalence of previous policies and sets of institutions (Krueger 1974).[9] At the same time, the higher constraints on his executive power as well as the potential threat of losing power in future elections prevents him for engaging in the kind of predation that one may observe with an autocrat with kleptocratic tendencies (or if the leader in a democracy does engage in predatory policies that lead to a fall in income, there is a high chance that the leader will lose power in a future election) (Geddes 1999, Burke and Leigh 2010, Justesen and Kurrild-Klitgaard 2013) Therefore, political institutions – in this case, democracy – may have an asymmetrical effect on episode magnitude in growth acceleration and deceleration episodes, and we can hypothesise as follows:

H1: Democracies are unlikely to out-perform autocracies in growth acceleration episodes. However, they are likely to yield lower income losses as compared to autocracies in growth deceleration episodes.

How autocrats behave with respect to long-term commitment to growth versus short-term predation would depend on the type of incentives as well as the constraints that autocrats face. In party-based autocracies, leader succession is typically institutionalised within the party structure, leading to lower uncertainty on what investors may expect when one leader makes way for the next leader (Wright 2008a). This also allows party-based autocracies to have long time horizons as the death of a leader does not imply the end of credible commitment from the leadership to a set of policies or institutions (Clague et al. 1996). In

[8] As De Luca et al. (2015) show, autocrats may obtain support from elites if they can generate higher growth rates than under democracies, effectively reducing any threat to their staying in power.

[9] For example, trade reforms which may increase economic growth in the medium term may be unpopular if they lead to job losses or the reduction of profits of protected politically influential firms.

contrast, in personalist, monarchic and military based autocracies, leader succession is typically informal and ad hoc, leading to significant uncertainty on the part of the leader as to when will he be removed (Geddes 1999). This leads to short time horizons on the part of the leader, providing a strong incentive to him to engage in predatory and distortionary economic policy, and a weak commitment to institutions such as protection of property rights (Wright 2008b).

A second feature of party-based autocracies that makes them qualitatively different from non-party based autocracies with respect to growth outcomes is that leaders in party-based autocracies use ruling party institutionalisation as a commitment device to investors (Gehlbach and Keefer 2011). By solving collective action problems within the ruling elite through institutionalisation, autocrats signal their intention not to expropriate from investors who are members of the ruling party (as happened in China in the post-Mao area). Thus, party based autocracies are more likely to observe higher investment than non-party based autocracies, leading to higher growth. This leads us to our second core hypothesis.

H2: Party-based autocracies are more likely to be associated with larger magnitudes of growth than non-party based autocracies during growth episodes.

IV. EMPIRICAL STRATEGY

Our interest centres around the causal effect of the political regime on the magnitude of growth in the growth episodes we have identified from Section II. To test our two core hypotheses, we estimate regressions of the following generic form:

$$gm_{ij} = \alpha_0 + \alpha_1 P_{ij} + \sum_{k \geq 2} \alpha_k X_{kij} + \delta_j + e_{ij} \qquad (1)$$

where *gm* is our episode magnitude measure as discussed in Section II, P is the measure of the political regime, X_{kt} is a vector of controls, δ_t are year effects, and e_{it} is the error term. The subscript i denotes country, and j the growth episode in question for country i.

Equation (1) does not make any distinction between growth accelerations and growth decelerations, and make the restrictive assumption that the effect of political institutions on the magnitude of growth in acceleration and deceleration episodes is identical. We relax

this assumption by estimating the effect of the political regime on episode magnitude in growth accelerations and decelerations separately, as follows:

$$gm^{a}_{ij} = \alpha^{a}_{0} + \alpha^{a}_{1} P_{ij} + \sum_{k \geq 2} \alpha^{a}_{k} X_{kij} + \delta^{a}_{j} + e^{a}_{ij} \quad (2a)$$

$$gm^{d}_{ij} = \alpha^{d}_{0} + \alpha^{d}_{1} P_{ij} + \sum_{k \geq 2} \alpha^{d}_{k} X_{kij} + \delta^{d}_{j} + e^{d}_{ij} \quad (2b)$$

Here, gm^a and gm^d are the episode magnitudes in growth accelerations and growth decelerations respectively.

As a measure of the type of political regime, we use POLITY, from Polity IV. This measure goes from -10 to +10, with regimes coded as -10 to 0 characterised as autocracies and regimes coded from 0 to +10 characterised as democracies.[10] In addition to POLITY, we use a measure of the degree of constraints on the executive (XCONST), and captures the extent of institutionalised constraints on the decision-making powers of chief executive, either individuals or collectivities.[11] This measure has been widely used in the empirical literature on institutions and growth as the preferred measure of the degree that there are institutional mechanisms of credible commitment on the part of the state (Acemoglu et al. 2001, Besley and Persson 2011).

We use the values of POLITY and XCONST in the beginning year of the growth episode to address potential reverse causality issues – that is, the possibility that higher growth leads to better quality political institutions, or that output contractions lead to more open political institutions (Burke and Leigh 2010). However, though we rely on Ordinary Least Squares as

[10] Each country-year observation in Polity IV is coded according to) i) the competitiveness and open-ness of executive recruitment; b) the competitiveness and regulation of political participation and the c) the constraints on the executive. Mature democracies according to this measure are regimes where there is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders, the existence of institutionalized constraints on the exercise of power by the executive, and the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation. Mature autocracies on the other hand sharply restrict or suppress competitive political participation. Their chief executives are chosen in a regularized process of selection within the political elite, and once in office they exercise power with few institutional constraints (Marshall et al. 2011).

[11] The variable XConst varies from a value of 1, when there are no regular limitations on the executive's actions, to a value of 7, when accountability groups have effective authority equal to or greater than the executive in most areas of activity.

our primary method of estimation, we also use instrumental variables estimators as a robustness test.

To assess the effect of type of autocracy on episode magnitude, we use the classification of autocracies in the data-set compiled by Geddes, Wright and Frantz (GWF, 2014). GWF identifies 280 autocratic regimes during the period 1946-2010 in independent countries with more than one million inhabitants in 2009. Each country-year is coded autocratic, democratic, ruled by a provisional government charged with overseeing a transition to democracy, not independent, occupied by foreign troops, or lacking a central government. Autocracies are then classified into dominant-party, military, personalist, or monarchic autocracies, depending on whether the leadership group in control of policy, leadership selection and the security apparatus is in the hands of a ruling party (party based autocracies), a royal family (monarchy), the military (rule by a military institution) or a narrower group centered around an individual dictator (personalist dictatorships). We use the classification of type of autocracy at the beginning of the episode provided by GWF (each type of autocracy is coded as a dummy variable – 1 if the regime is of a particular type, 0 otherwise; we create a dummy variable for non-party based autocracies, where the dummy is 1 if the autocracy is personalist, monarchic or military, 0 otherwise).

Our control variables are those that are standard in the growth empirics literature – the log of initial per capita income at the beginning of the episode to capture conditional convergence (Barro and Sala-i-Martin 1992), trade open-ness (that is, exports plus imports as a ratio of GDP) (Frankel and Romer 1995, Sachs and Warner 1996,, Dollar and Kraay 2004,), resource rents as a ratio of GDP) (Isham et al. 2005), and commodity price shocks[12] (Burke and Leigh 2010). We would expect that trade-openness will have a positive effect on growth magnitude. On the other hand, the effects of resource rents and commodity price shocks on the magnitude of growth is indeterminate – a resource boom or a surge in commodity prices may lead to a boom in economic growth, but could also have a growth collapse more likely due to over-investment in the initial years of the growth episode. We also use year fixed effects to incorporate common period shocks to GDP across all countries (e.g. an oil price increase or a global recession).

[12] We measure the latter as the difference in the average of real commodity prices three years after the onset of the episode and the average of real commodity prices for the three years before the onset of the episode.

V. DATA AND DESCRIPTIVE STATISTICS

Data: The data on political regimes are obtained from the Polity IV project hosted by the Centre for Systemic Peace, (http://www.systemicpeace.org/polityproject.htm) and data on the type of autocracy is obtained from http://sites.psu.edu/dictators/. The data on per capita income, trade open-ness and resource rents are obtained from the World Bank's *World Development Indicators*. The data on commodity prices is obtained from Burke and Leigh (2010). The data on the ICRG protection of property rights (also to be used in the empirical analysis) is obtained directly from Political Risk Services (PRS) (https://www.prsgroup.com/).

Descriptive Statistics:

We begin with looking at the top ten growth accelerations and growth decelerations ranked by the value of the episode magnitude obtained by the Partial Regression to the Mean procedure. The largest growth acceleration episode occurred in Taiwan from 1962 to 1993, with Taiwan's GDP per capita 170 per cent higher than it would have been had it grown at the predicted rate versus the actual rate. The largest growth deceleration episode occurred in Iran from 1976 to 1987 with Iran's GDP per capita 176 per cent lower than it would have been had it grown at the predicted rate versus the actual rate. We also observe that nine of the ten countries with the largest growth acceleration episodes were autocracies at the beginning of their episodes. Similarly, nine of the ten countries with the largest growth deceleration episodes were autocracies at the beginning of their episodes. Interestingly, all the autocracies associated with the largest growth acceleration episodes are party-based autocracies, while the autocracies associated with the largest growth deceleration episodes are a mix of party-based, monarchic, military-based and personalist autocracies. The higher variance in growth outcomes among autocracies as compared to democracies is also observed in Figure 3, where we see autocratic regimes have had the largest booms but also the largest busts, while growth outcomes have been far more bounded in both sides of the distribution for democracies.[13]

[13] We classify democracies as those countries with a POLITY measure between zero and ten, and autocracies as those countries with a POLITY measure between minus ten and zero.

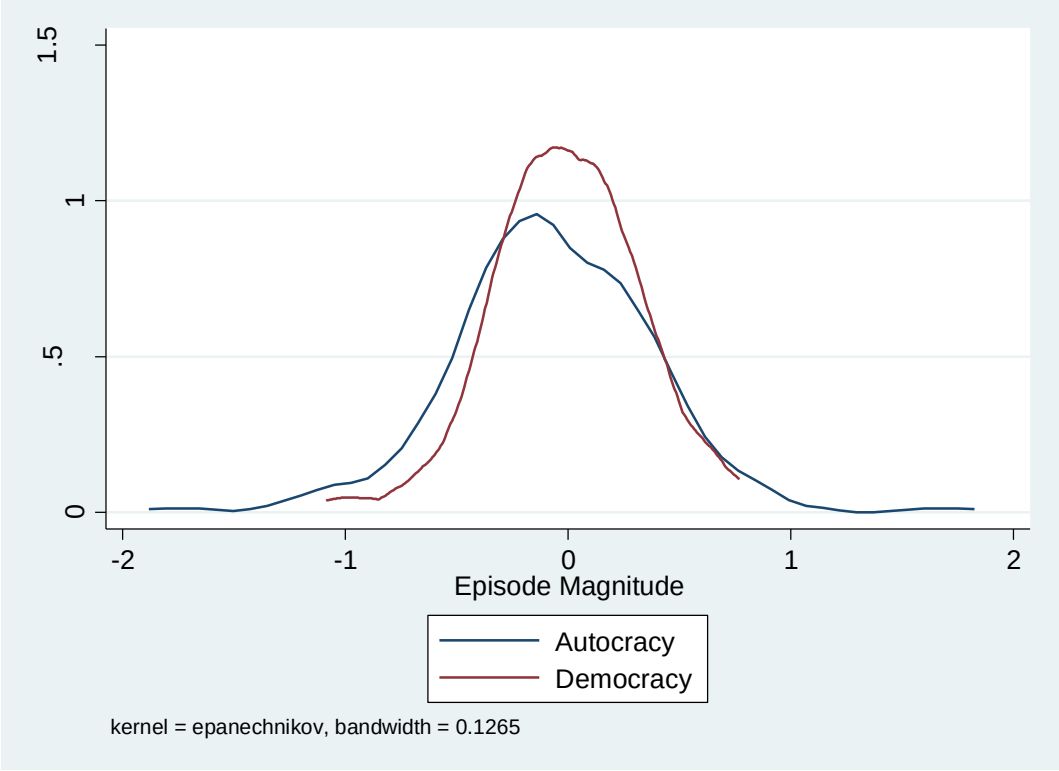
Table 2: Top Growth Accelerations and Decelerations

Top Ten Growth Accelerations							
Country	**Year Started**	**Year Ended**	**Episode Magnitude**	**Duration (years)**	**Polity**	**Constraints on Executive**	**Autocracy?**
Taiwan	1962	1993	1.699	32	-8	2	Yes (Party-based)
Indonesia	1967	1995	1.01	28	-7	2	Yes (Party-based)
Egypt	1976	1991	0.908	16	-6	3	Yes (Party-based)
China	1977	1990	0.776	14	-7	3	Yes (Party-based)
Vietnam	1989	2010	0.717	21	-7	3	Yes (Party-based)
Singapore	1968	1979	0.698	12	-2	3	Yes (Party-based)
Laos	1979	2001	0.678	23	-7	3	Yes (Party-based)
Trinidad and Tobago	2002	2010	0.622	8	10	7	No
China	1991	2010	0.606	19	-7	3	Yes (Party-based)
Albania	1992	2010	0.595	18	5	5	No
Top Ten Growth Decelerations							
Country	**Year Started**	**Year Ended**	**Episode Magnitude**	**Duration**	**Polity**	**Constraints on Executive**	**Authoritarian?**
Iran	1976	1987	-1.755	12	-10	1	Yes (Monarchy)
Afghanistan	1986	1993	-1.201	8	-8	2	Yes (Party-based)
Malawi	1978	2001	-1.195	24	-9	1	Yes (Personalist)
Congo, Dem. Republic	1989	1999	-1.086	11	-10		Yes (Personalist)
Iraq	1979	1990	-1.061	12	-9	1	Yes (Party-based)
Jordan	1965	1973	-0.996	9	-9	2	Yes (Monarchy)
Trinidad and Tobago	1980	1988	-0.958	9	8	7	No
Jordan	1982	1990	-0.928	9	-10	1	Yes (Monarchy)
Brazil	1980	2001	-0.898	22	-4	1	Yes (Military)
Somalia	1978	2010	-0.862	32	-7	1	Yes (Personalist

Note: Autocracy: type of autocracy in brackets.

Source: our calculations, Autocracy classification from Polity IV and GWF.

Figure 3. Kernel Density Plot of Episode Magnitude, by Political Regime



In our sample of 288 growth episodes for which we have data on POLITY,[14] we see that both the distributions of POLITY and XCONST are sharply twin peaked, with countries in our sample either being strongly autocratic (and have limited constraints on their executives) or strongly democratic (with strong constraints on their executives) at the beginning of their growth episodes (Figures 4 and 5).

[14] We omit the episodes where Polity IV coded these episodes as interruption, interregnum and transitional periods as the type of political regime for these episodes was indeterminate.

Figure 4. Kernel Density Plot of POLITY

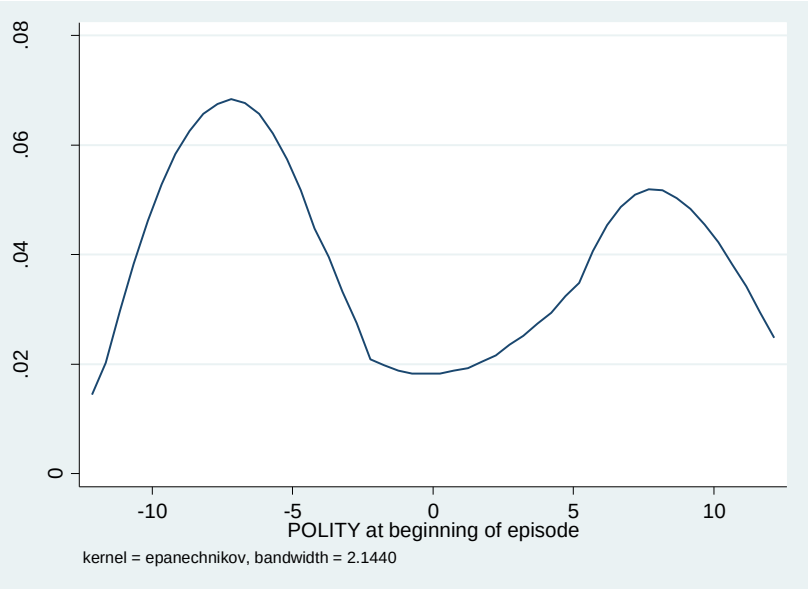
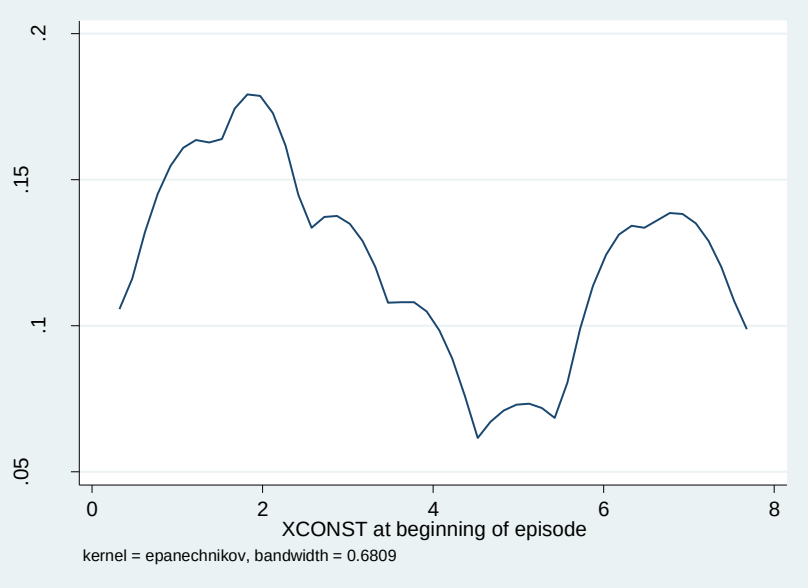


Figure 5. Kernel Density Plot of XCONST



In Figures 6 and 7, we plot the bivariate relationships between episode magnitude and POLITY, and between episode magnitude and XCONST respectively. We observe a weak positive relationship between the magnitude of growth and democracy/constraints on the executive.

Figure 6. Episode Magnitude and POLITY

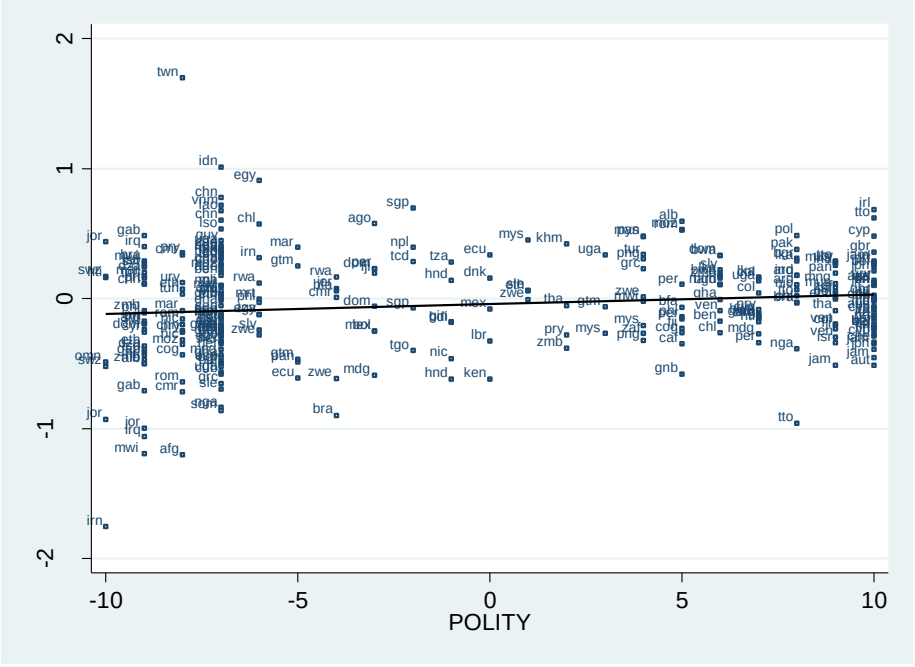
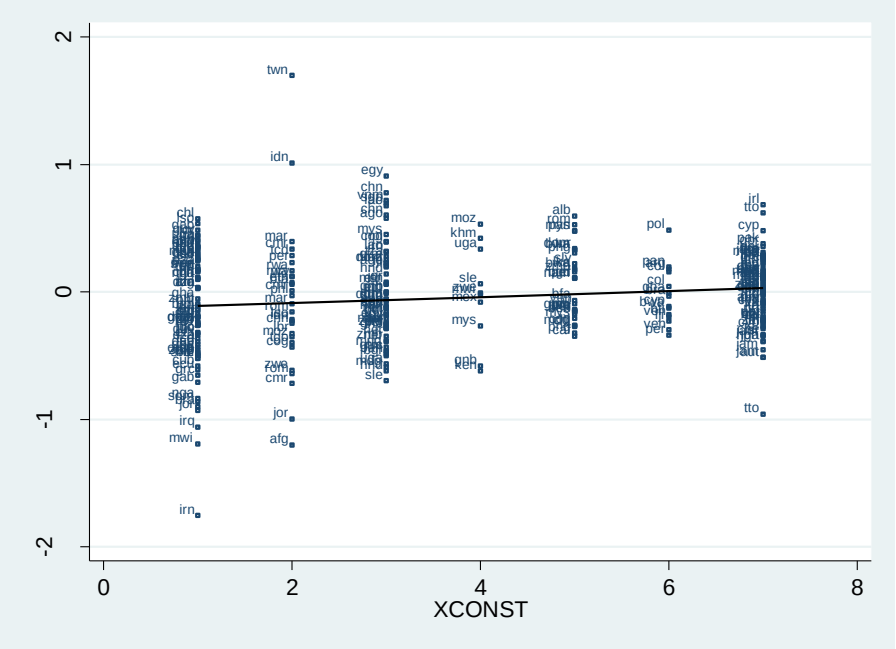


Figure 7. Episode Magnitude and XCONST



Next, we examine whether the average magnitude of growth in an episode differs by political regime (Table 2). While the average magnitude of growth across all episodes is negative for both autocracies and democracies, democratic regimes perform better than autocratic regimes on average across all episodes, with a lower average income loss (-0.005 versus -0.068) and a lower standard deviation (0.326 versus 0.438). However, disaggregating the data by growth accelerations and decelerations, we find that autocratic regimes have a higher magnitude of growth in growth accelerations than democratic regimes, suggesting in a boom, autocracies see higher income gains than democracies. At the same time, the standard deviation of the episode magnitude is higher in autocracies than democracies, indicating the higher volatility in growth outcomes for autocracies.

In contrast, in growth decelerations, autocracies witness larger income losses than democracies (an average episode magnitude of growth of -0.358 for autocracies as compared to -0.256 for democracies), again with a higher standard deviation (0.292 for autocracies versus 0.211 for democracies). This suggests that a focus on the average effect of democracy on growth outcomes is misleading, as autocracies are likely to observe larger booms as well as larger busts than democracies.

Table 2. Episode Magnitude, Summary Statistics, by Regime Type

Political Regime	Number of observations	Mean	Standard Deviation	Minimum	Maximum
Autocratic Regimes					
Episode Magnitude, All Episodes	154	-0.068	0.438	-1.755	1.699
Episode Magnitude, Accelerations	65	0.321	0.266	0.006	1.699
Episode Magnitude, Decelerations	89	-0.358	0.292	-1.755	-0.001
Democratic Regimes					
Episode Magnitude, All Episodes	133	-0.005	0.326	-1.086	0.771
Episode Magnitude, Accelerations	66	0.255	0.192	0.006	0.771
Episode Magnitude, Decelerations	67	-0.256	0.211	-1.086	-0.002

Do growth outcomes differ by the type of autocracy? Table 3 suggests that it does, with party based autocracies likely to witness a higher magnitude of growth on average across all episodes as compared to military regimes, monarchies and personalised autocracies (an average of 0.004 for party based autocracies, as compared to -0.117 for military regimes, -0.245 for monarchies and -0.111 for personalised regimes). In the case of growth accelerations, party based autocracies significantly outperform all other types of autocracy, with an average episode magnitude of 0.393, as compared to 0.282 for military regimes, -0.245 for monarchies and 0.233 for personalised regimes. When it comes to growth decelerations, the picture is mixed, with personalist monarchies having the lowest income loss among all types of autocracy (an average of -0.317 for personalised regimes as compared to -0.336 for party based autocracies, -0.383 for military regimes, and -0.735 for monarchies).

Table 3. Episode Magnitude, Summary Statistics, by Type of Autocracy

Political Regime	Number of observations	Mean	Standard Deviation	Minimum	Maximum
Party-based Regimes					
Episode Magnitude, All Episodes	88	0.004	0.464	-1.201	1.699
Episode Magnitude, Accelerations	41	0.393	0.326	0.033	1.699
Episode Magnitude, Decelerations	47	-0.336	0.248	-1.201	-0.008
Military Regimes					
Episode Magnitude, All Episodes	35	-0.117	0.417	-0.898	0.771
Episode Magnitude, Accelerations	14	0.282	0.257	0.030	0.771
Episode Magnitude, Decelerations	21	-0.383	0.258	-0.898	-0.012
Monarchies					
Episode Magnitude, All Episodes	14	-0.245	0.639	-1.755	0.436
Episode Magnitude, Accelerations	7	0.245	0.158	0.066	0.436
Episode Magnitude, Decelerations	7	-0.735	0.548	-1.755	-0.091
Personalist Autocracies					
Episode Magnitude, All Episodes	40	-0.111	0.355	-1.195	0.410
Episode Magnitude, Accelerations	15	0.233	0.126	0.008	0.410
Episode Magnitude, Decelerations	25	-0.317	0.279	-1.195	-0.005

VI. RESULTS

We now turn to the estimation of equations (1), (2a) and (2b). Table 4 presents the summary statistics of the variables included in the regressions and Table 5 presents the main results. In Cols. (1) and (2), we present the results of the basic specification of equation (1) estimated with Ordinary Least Squares, without controls (initial level of per capita income, trade/GDP, resource rents/GDP, and commodity price shocks) but with the year fixed effects included in the regressors. We first estimate equation (1) with the POLITY measure and then with XCONST as our key Right Hand Side (RHS) variable. We find that democracy as well as higher degree of constraints on the executive has a positive effect on the magnitude of growth. When we add the control variables in Cols. (3) and (4), the main results do not change - the coefficients on POLITY and XCONST are positive and significant. This suggests that on average, more democratic regimes are likely to observe a higher magnitude of growth.

The first of our core hypotheses is that democracy and constraints on the executive are likely to a different effect on growth accelerations as compared to growth decelerations. To test this hypothesis, we estimate equations (2a) and (2b), with controls and year effects, with POLITY and XCONST included in turn as the key explanatory variable. We present these results in Cols. (5) and (6) for growth accelerations, and in Cols. (7) and (8) for growth decelerations. We find that POLITY and do not have any discernible effect on the magnitude of growth during a growth acceleration – the coefficients on these two variables are statistically not different from zero, both with and without controls. However, both POLITY and XCONST are positive and statistically significant for growth decelerations. This supports our hypothesis that democracy and the constraints on the executive and political competition matter more in limiting negative growth episodes than in enhancing positive growth episodes. Thus, the greater the extent of democracy and the constraints on the executive, the less likely is the possibility of growth collapses, without any discernible change in the likelihood of growth booms.

With respect to the control variables, trade open-ness as expected has a positive effect on growth magnitude, while resource rents and commodity price shocks do not have any discernible negative effect on growth magnitude. The initial level of per capita income does

not have a discernible effect on growth magnitude, suggesting that the magnitude of growth is not systematically related to the level of per capita income at the beginning of the episode.

Robustness Tests

One possibility with our main regression results as in Table 5 is that both the magnitude of growth and our key political institutions are correlated with unobserved country characteristics. This is a remote possibility as the maximum number of episodes for any country is three, and the average number of episodes per country is two. Nevertheless, to test for this possibility, we include country fixed effects in our set of controls (Cols. (4) to (6)). Here, and in the rest of the robustness tests in Table 6, we focus on the constraints on the executive as our preferred variable to capture political institutions.[15] We find that the coefficient on constraints to the executive remain statistically significant at the 1 per cent level (Col. (1)).[16]

A second robustness test we perform is to whether our results are sensitive to the exclusion of the truncated episodes (i.e., episodes which begin in 2002 and end in 2010 due to lack of data availability after that year). Dropping all post-2002 episodes, we find no change in our finding that constraints on the executive has a positive and statistically significant effect on episode magnitude for growth deceleration episodes but there is no such positive effect for growth acceleration episodes (Col. (2)).

One other possibility of omitted variable bias is that our measures of political institutions may be correlated with the quality of economic institutions, and it is the latter which may explain the association we have found so far between our preferred measures of political institutions and the magnitude of growth. To address this possibility, we include the ICRG measure of the protection of protection rights that is commonly used in the econometric analysis of the effects of institutions on economic growth (Acemoglu, Johnson and Robinson

[15] In all our robustness tests, we also used POLITY as the key RHS variable, with no change in our results.

[16] We also examined whether our results are sensitive to our calculation of the magnitude of growth using the "unconditional predicted" counter-factual growth rate. As a robustness test, we used our estimates of episode magnitude using the 'world average' counter-factual growth rate, and find that there is no change in our results.

2001, Rodrik, Subramanian and Trebbi 2004). This measure is only available from 1984, and so we confine our analysis to growth episodes which begin in 1984 or later. We find that our main finding – that higher constraints on the executive limit the likelihood of large growth collapses but do not necessarily increase the likelihood of large growth booms – is remarkably robust to the inclusion of economic institutions on the RHS and to the reduction in the sample (Col. 3)).

Next, we explore the possibility that there may be reverse causality in the positive relationship between our core political institution variable and the episode magnitude, with the positive growth episodes (or less negative growth episodes) leading to greater state capacity (as captured by the strengthening of the constraints that are placed on executives) and democratisation (Burke and Leigh 2010). To address the possibility of reverse causality, we use Two Squares Least Squares (2SLS) estimates and two standard instruments proposed in the institutions literature – the settler mortality rate proposed by Acemoglu, Johnson and Robinson (AJR, 2001) and the ethnic fractionalisation measure proposed by Alesina et al. (2003).[17] The 2SLS estimates of the effect of XCONST on episode magnitude is almost twice in size as the OLS estimate for growth decelerations, and is significant at the 5 per cent level, suggesting that endogeneity may have been a concern with the OLS estimates (Col. (4)).[18] For growth accelerations, as with the OLS estimates, the coefficient on constraints on the executive is statistically not different from zero in the 2SLS estimate. Our finding that the coefficient on the core political institutions variable remains positive and significant in the 2SLS estimates increase our confidence that higher constraints on the executive are a cause and not a consequence of a lower likelihood of a fall in incomes during a growth collapse.

Finally, we look at the effect of type of autocracy on episode magnitude in Table 7. We find that, along with democratic regimes, party-based autocracies lead to larger magnitude of

[17] The settler mortality rate is an indirect measure of the disease environment in the colonies, and thus, measures the likelihood of Europeans settling in a particular colony and setting up institutions of private property. AJR find that there is a high correlation between the mortality rates faced by soldiers, bishops and sailors in the colonies and European settlements and early measures of institutions, and between early institutions and current institutions. As AJR show, the settler mortality rate is not able to explain current development outcomes directly and thus meets the exclusion restriction for a valid instrument. With respect to the ethnic fractionalisation measure, Alesina and Zhuravskaya (2009) show that this measure is negatively related to a variety of institutional measures including the quality of government and the rule of law.

[18] The underidentification and the instrument suitability test (Hansen J statistic) show that the estimation does not suffer from a weak instruments problem.

growth across all growth episodes (Col. (1)).[19] When we disaggregate episodes by whether the episode is an acceleration or a deceleration, we find that party-based autocracies and democracies are both likely to yield larger acceleration episodes (Col. (2)).[20] Interestingly, the effect of party-based autocracies on episode magnitude is larger than that of democracies. In contrast, in growth deceleration episodes, party-based autocracies do not perform better than other types of autocracies in preventing large growth collapses. The effect of democracy in reducing the magnitude of income loss in a deceleration episode, as found earlier, remains, even when we control for the type of autocracy. These results provide some support for our second core hypothesis: that party-based autocracies are likely to yield larger magnitudes of growth in growth episodes – however, we find that while party-based autocracies outperform non party-based autocracies in growth acceleration episodes, there is no such difference in growth deceleration episodes. Here, democracies do better than *all* types of autocracies in preventing large income losses in growth deceleration episodes.

[19] In the regressions, we include two dummy variables, one if the regime is a party-based autocracy, and the other if the regime is a democracy. The residual category is non-party based autocracies.

[20] We exclude the country-episode observations where the country is ruled by a provisional government charged with overseeing a transition to democracy, not independent, occupied by foreign troops, or lacking a central government.

Table 4. Summary Statistics, All Variables

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Episode Magnitude, All	314	-0.044	0.394	-1.755	1.699
Episode Magnitude, Only Accelerations	144	0.282	0.236	0.006	1.699
Episode Magnitude, Only Decelerations	170	-0.320	0.270	-1.755	-0.001
POLITY	287	-0.341	7.388	-10	10
XCONST	287	3.756	2.347	1	7
Initial Per Capita Income (ln)	314	7.931	1.205	5.115	10.515
Trade/GDP (per cent)	299	67.58	47.20	2.137	373.179
Resource Rents/GDP (per cent)	293	7.640	10.814	0	61.723
Commodity Price Shocks	282	-0.022	0.090	-0.277	0.269

Table 5. Regression Results: Does the Political Regime Matter?

	All Episodes				Growth Accelerations		Growth Decelerations	
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POLITY	0.007*	0.014***	--	--	0.002	--	0.011**	--
	(0.051)	(0.001)			(0.678)		(0.010)	
XCONST	--	--	0.022**	0.042***	--	0.003	--	0.041**
			(0.034)	(0.002)		(0.820)		(0.005)
Initial Per Capita Income (ln)	--	-0.091***	--	-0.036	-0.037	-0.035	-0.016	-0.023
		(0.001)		(0.159)	(0.147)	(0.174)	(0.575)	(0.434)
Trade/GDP	--	0.002***	--	0.002***	0.001**	0.001**	0.001**	0.001**
		(0.001)		(0.000)	(0.019)	(0.020)	(0.014)	(0.015)
Resource Rents/GDP	--	0.001	--	-0.001	0.004	0.004	-0.004**	-0.004*
		(0.735)		(0.350)	(0.164)	(0.178)	(0.031)	(0.056)
Commodity Price Shocks	--	0.053	--	0.258	0.377	0.369	-0.582*	-0.615*
		(0.868)		(0.83)	(0.180)	(0.189)	(0.060)	(0.053)
Year Effects	YES	YES	YES	YES	YES	YES	YES	YES
R-square	0.20	0.21	0.16	0.21	0.35	0.34	0.42	0.43
Number of Observations	287	254	258	254	114	114	140	140

Note: Ordinary Least Squares, robust standard errors; : *,** and ***: significant at 10, 5 and 1 per cent levels; we do not report the intercept term.

Table 6. Robustness Tests

Explanatory Variables	(1)	(2)	(3)	(4)
Growth Accelerations				
XCONST	0.017 (0.523)	-0.002 (0.896)	0.010 (0.640)	0.029 (0.467)
Protection of Property Rights	--	--	0.036 (0.128)	--
Controls	YES	YES	YES	YES
Year Effects	NO	YES	YES	YES
R-square	0.19	0.32	0.44	--
Hansen's J Test	--	--	--	0.427 (0.513)
F statistic	--	--	--	3.44***
Number of Observations	114	103	75	76
Growth Decelerations				
XCONST	0.050* (0.066)	0.041*** (0.005)	0.038** (0.023)	0.090** (0.023)
Protection of Property Rights	--	--	0.013 (0.607)	--
Controls	YES	YES	YES	YES
Year Effects	NO	YES	YES	YES
R-square	0.20	0.44	0.48	--
F statistic	--	---	--	1.97**
Hansen's J Test	--	--	--	2.60 (0.110)
Number of Observations	140	130	112	90

Note: Ordinary Least Squares, robust standard errors; : *,** and ***: significant at 10, 5 and 1 per cent levels; Col. (1): With Country Fixed Effects; Col. (2): Dropping all growth episodes which begin in 2002; Col. (3): Including Protection of Property Rights (ICRG), from 1984; Col. (4): IV estimates, Instruments for XCONST: Settler Mortality Rate (from Acemoglu-Johnson-Robinson 2001) and Ethnic Fractionalisation (from Alesina et al. 2003); Chi-square p-value in brackets for J Test.

Table 7. Further Regression Results: Does the Type of Autocracy Matter?

Explanatory Variables	(1)	(2)	(3)
Party based Autocracy	0.139* (0.062)	0.164** (0.019)	0.084 (0.259)
Democracy	0.241*** (0.001)	0.144* (0.060)	0.126* (0.088)
Controls	YES	YES	YES
Year Effects	YES	YES	YES
R-square	0.35	0.43	0.42
Number of Observations	240	113	127

Note: Ordinary Least Squares, robust standard errors; : *,** and ***: significant at 10, 5 and 1 per cent levels; Col. (1): All growth episodes; Col. (2): Only growth accelerations; Col. (3): Only growth decelerations. The residual categories here are non-party based autocracies.

VII. Conclusions

In this paper, we take a fresh look at the democracy-growth relationship, focusing on medium term growth episodes rather than long-run growth. Drawing from the theoretical literature, we hypothesise that democracies are not likely to outperform autocracies in growth accelerations, though they would prevent large growth collapses. We also hypothesise that party-based autocracies would have more likely to be associated with large growth accelerations than monarchic, military-based and personalistic monarchies. Using 314 growth episodes for 125 countries for 1950-2010 and a new measure of quantifying the magnitude of growth in episodes of growth, we find strong evidence in support of our two hypotheses. Our focus on episodic growth rather than long-run growth allows us to show that the effect of the political regime on growth is asymmetric across accelerations and decelerations. We also highlight the importance of the type of autocracy in understanding the effects of regime type on growth.

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