Leadership Change and Economic Growth in Politically Unstable Countries

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Abstract

We examine the impact of leadership change after a coup d'état on economic growth. We consider successful coup attempts as our treatment group and use failed coup attempts as controls to condition on political instability. To take account of selection bias, we control for the determinants of coup success. Our main finding is that leadership changes after a coup d'état have a positive effect on economic growth in the least developed countries, but have a negative effect in other developing countries.

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1 Introduction

A coup d'état can have far reaching consequences for a country. On the one hand, the unconstitutional replacement of the executive leader can be accompanied by (or result in) domestic violence and political instability. On the other hand, the newly arrived leader can implement new policies and sometimes even set up a new institutional framework. It is widely believed that political instability has detrimental economic effects, such as low economic growth rates (Barro, 1991, Alesina et al., 1996, and Jong-A-Pin, 2009).[1] Even though coups in general may harm growth, leadership changes after a coup might be better than the status quo. In the case of Indonesia, for example, the policies of Suharto proved to be a turning point in the economic history of Indonesia, where market-oriented policies have led to economic growth in the years after the coup (Friend, 2003).

There is a growing body of evidence indicating that leadership changes are important for economic outcomes. Jones and Olken (2005) find evidence that leadership changes positively affect economic growth. This holds especially for autocratic countries, where the constraints on the chief executive are generally limited. Besley et al. (2011) argue that the positive effect on economic growth is due to the difference in education across leaders. In a similar way, Dreher et al. (2009) show that political leaders influence market-liberalizing reforms, while there is ample evidence that market-liberalizing reforms contribute to economic growth (see e.g. De Haan et al., 2006). Other studies on the relevance of leaders show that they influence fiscal policy (Hayo and Neumeier, 2014, Jochimsen and Thomasius, 2014), inflation rates (Göhlmann and Vaubel, 2007), institutions (Jones and Olken, 2009) and voting in the UN General Assembly (Dreher and Jensen, 2013).

In this chapter, we examine whether leadership changes due to a coup d'état affect economic growth. We do so by comparing economic growth rates after successful coups and after failed coups attempts. Our approach allows us to disentangle the effect of a leadership change from political instability, since in both cases the country witnesses political instability (Fosu, 2002), while only in the case of a successful coup the political leader changes. Furthermore, this event study approach is better able to identify the causes of changes in economic development of countries. Since countries have distinct growth patterns (Pritchett, 2000, Bos et al., 2010), standard cross-country growth regressions have been unable to identify these changes in growth patterns (De Haan, 2007). Since we focus

[1] Campos and Nugent (2002) is one of the few studies that find no robust relation between political instability and economic growth, although they do find surpportive evidence for Sub-Saharan African countries.

on events that precede the economic growth period, our approach can give an answer to the question of whether a leadership change after a coup d'état is causing a turning point in economic growth.[2][3]

Besides the question of whether economic growth is affected after a successful coup attempt, we further examine via which channel economic growth is affected. Acemoglu and Robinson (2006), for example, argue that economic structures matter for the choice of political regime, since coup and repression costs depend on the endowment of production factors. As production factors have different elasticities of supply, we argue that the effects of coups on economic growth are also conditional on the economic structure and proxy this by differentiating between developing countries that are relatively poor and those that are relatively rich.

Previewing our results, leadership changes after a coup d'état do affect economic growth. The effect is positive in poor countries and negative in rich countries. This might reflect a convergence effect as poor countries experiencing a leadership change have more potential to grow than richer countries. However, in line with the theoretical framework of Acemoglu and Robinson (2006), we find evidence that the economic structure drives this effect. We find that with a new leader after a successful coup, countries with above median income per capita have lower investment levels and lower trade levels, while at the same time countries with income per capita below the median have increased human capital levels after leadership change. Furthermore, we find that especially the richer countries tend to democratize after a successful coup attempt.

This chapter continues as follows. In the next section we discuss how we aim to identify the impact of leadership change on economic growth using data on coup attempts. In section 3, we examine the impact of leadership change after a coup d'état on economic growth. In section 4, we examine the role of economic structure in the relation between coups and economic growth. Finally, section 5 concludes the paper.

[2] A similar methodology is used by Jones and Olken (2009), who study the impact of political assassinations on changes in democracy and civil war.

[3] Leon (2014) uses the same identification strategy but analyzes whether random variation in coup success influences military spending.

2 Empirical strategy

We aim to identify the impact of leadership change after a coup d'état on economic growth conditional on the effect of political instability. To that end, we compare the average 10-year economic growth rate of two groups of countries.[4] Both groups have faced a period of political instability in the form of a coup attempt. The first group contains those countries that received a treatment, i.e., a leadership change after a successful coup. The second group was not treated with leadership change, i.e., these coup attempts failed. Hence, our sample consists only of cases where there actually was a coup attempt and, as such, we interpret the difference in economic growth between the two groups as the impact of leadership change after a coup d'état conditional on political instability (and other control variables).

When coup success would be randomly assigned to coup attempts, the impact of leadership change would be easily identified. However, selection bias with respect to endogenous selection on the treatment, i.e., successful outcomes, might trouble the identification of the leadership change effect. That is, there may be variables that both affect coup success and economic growth. In that case, there will be a correlation between coup success and the error term of the regression model, which results in biased estimation of the leadership change effect on economic growth. Studies by Powell (2009) and Singh (2009) suggest that the successfulness of coup attempts is not fully random.[5] To ensure that selection effects do not bias our results, we first investigate the determinants of coup success (X_{it}).

We consider the same set of variables as suggested by Powell (2009) and Singh (2009). These studies argue that leadership characteristics are highly important for the outcome of a coup d'état. To proxy these characteristics, we collected data about the qualifications of the coup leader at the time of the coup attempts.[6] That is, we know whether a coup leader was a civilian, from a royal family, or part of the military. If he was part of the military, we also know his rank within the military. Figure 1 shows that coup attempts are more successful when attempted by someone from the military and, moreover, that

[4] Data on economic growth rates are taken from the Penn world table 6.3 (source: Heston et al., 2009).

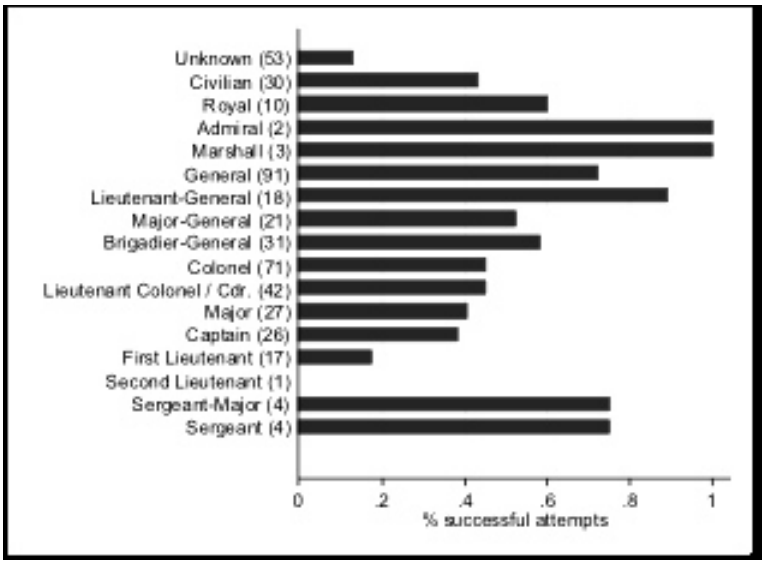
[5] Even though the successfulness of coup attempts is not fully random, there is much anecdotal evidence that randomness plays an important role in the outcome of a coup attempt. See, for instance, Kebschull (1994), Gott (2000), or Dunlop (2003).

[6] Sources: www.keesings.com, Marshall and Marshall (2007), The New York Times, and www.wikipedia.org.

higher ranked officers are more successful than lower ranked officers.[7][8][9]

Apart from leadership characteristics, Powell (2009) and Singh (2009) include variables related to military strength, the political landscape, and the economic environment. Here, we do not explain why these variables should matter for coup success and economic growth as our aim is to identify variables that might cause a selection bias in the relation between coup success and economic growth (see Jong-A-Pin and Yu (2010) for a detailed explanation of the hypotheses underlying the determinants of coup success).

Figure 1: Coup leaders and coup success rates



Note: the figure shows the fraction of successful coup attempts for different groups of coup leaders. The numbers in parentheses refer to the number of attempts by the respective group. Sources: www.keesings.com, Marshall and Marshall (2007), The New York Times, and www.wikipedia.org.

The variable that measures whether a coup attempt has succeeded is taken from Powell and Thyne (2011) and covers all coup attempts from 1950 to 2007.[10] Our dependent

[7]Attempts by Sergeants and Sergeants-Majors are exceptions to this regularity. However, attempts by these officers are rare as there were only 8 such attempts.

[8]Our data set also includes a number of cases, where the leader of the coup could not be identified. It is not surprising to see that most of these coups have failed. There are few cases in which a coup succeeded, but the leader is not identified. In these cases, our sources refer to groups of individuals for which there was no apparent leader, such as the police (Panama, 1951), a group of officers (Cyprus, 1974), or the armed forces (Uruguay, 1976).

[9] We differentiate between a "General dummy", which ranges from Brigadier-General to Admiral; a "Mid-range officer dummy", ranging from Second Lieutenant up till Colonel; and a "Sergeant dummy", which includes Sergeant-Major and Sergeant.

[10]Powell and Thyne (2011) define a coup attempt as: "attempts by the military or other elites within

variable is a binary variable equal to one if a coup attempt succeeded and zero otherwise. In all, we study 452 cases from 189 countries of which the unconditional probability of coup success is 49.3 percent. We estimate a binary choice model (logit) with the dummy variable for coup success as the dependent variable and all suggested determinants as explanatory variables.[11] The results are reported in column 1 of appendix B. Furthermore, we estimate a number of robustness checks, where we use a general-to-specific approach and then add the other suggested variables one by one to the model (columns 2-18). Finally, we estimate a specification where we add all variables that are at least one time significant in previous specifications (column 19). We find that alignment with a Cold war superpower, GDP per capita, and the type of coup leader have a significant impact on coup success. That is, when a country has been aligned to the U.S or the Soviet Union, the probability of a successful coup decreases.[12] The probability of a successful coup attempt also decreases when countries are richer. Finally, the probability of a successful coup significantly differs between military coup leaders and non-military coup leaders as well as between military ranks.

Countries that have experienced one or more coup attempts vary widely in their level of economic development. For example, when Liberia experienced a coup attempt in 1994, income per capita was more than 100 times lower than income per capita at the time of the coup attempt in Qatar in 1995. The economic growth literature has stressed the importance of (conditional) convergence effects (Barro and Sala-i Martin, 1992, and Durlauf et al., 2005). Poor countries are expected to grow faster (conditional on a certain set of variables) than rich countries. In the context of our approach this does not only imply that economic growth is higher the poorer a country is, it also implies that poor countries have more scope to grow after a successful coup. Therefore, we include GDP per capita in our model to control for a convergence effect, but also include an interaction term of GDP per capita with a dummy variable for coup success to capture the fact that leadership changes in poor countries provide more opportunity for acceleration in economic growth than in rich countries.[13]

the state apparatus to unseat the head of government using unconstitutional means." Furthermore, they define success as: "events in which the sitting head of government is removed for at least one week."

[11] Descriptive statistics and sources are reported in Appendix A.

[12] Even though there are a number of examples of coups that have been "sponsored" by Cold war superpowers (see, e.g., Aidt and Albornoz, 2011), the net effect of alignment to a Cold war superpower is negative. That is, the deterrence effect of being aligned to a superpower outweighs the effects of those cases in which a Cold war superpower has supported a coup attempt.

[13] Technically, including GDP per capita as a control variable in the model allows for different levels (intercepts) of economic growth for each country in the sample. Including the interaction term between GDP per capita and coup success allows for a different slope with respect to the size of the leadership change effect.

In all, our approach amounts to regressions of the following form:

$$\bar{g}_{it,it+10} = \beta_0 + \beta_1 Coupsuccess_{it} + \beta_2 ln(GDPCAP_{it}) + \beta_3 Coupsuccess_{it} * ln(GDPCAP_{it}) + \sum_{j=4}^{n} \beta_j X_{it} + \varepsilon_{it} \quad (1)$$

where $\bar{g}_{it,it+10}$ represents the average economic growth rate of country i in the 10 years after the coup attempt in year t, $Coupsuccess_{it}$ is a dummy indicating whether the coup attempt in country i in year t was successful.[14] $GDPCAP_{it}$ is real GDP per capita in the year of the coup attempt, X_{it} is a vector of control variables, and ε_{it} is the error term.

Provided that the allocation of observations over successful coups and failed coups is exogenous conditional on the control variables (i.e., $E(\varepsilon_{it}|X_{it}, Coupsucces_{it}) = 0$), we can estimate the marginal effect of coup success on economic growth in a straightforward way (see Brambor et al. (2006) for details).

In principle, we estimate our model using ordinary least squares (OLS) regressions. However, as discussed, the success of a coup attempt might be endogenous to other determinants of economic growth. To ensure that our results are not driven by the used estimator, we also estimate the model using an endogenous treatment (Heckman type) model. That is, we exploit the predictors of coup success in a first stage regression to obtain the predicted (exogenous) probability of coup success, which is then used in the economic growth specification. A Likelihood Ratio test that examines which model is to be preferred leads us to the conclusion that the independence of the two equations of the Heckman approach cannot be rejected at the conventional significance levels. Hence, it can be concluded that the identification does not improve if the model is estimated as a two-equations system. Consequently, we rely on the OLS estimates in our further analyses.

3 Estimation results

Table 1 shows the estimation results of different variants of our main model.

[14] We follow Powell and Thyne (2011) and define a coup attempt as attempts by the military or other elites within the state apparatus to unseat the head of government using unconstitutional means. Furthermore, they define success as:events in which the sitting head of government is removed for at least one week.

Table 1: The impact of leadership change after a coup d'état on economic growth

Dependent variable: Economic growth rate after coup attempt	[1]	[2]	[3]	[4]	[5]	[6]
Coup success	0.05	0.76*	1.12***	0.92**	1.38**	1.23**
	(0.51)	(2.37)	(4.00)	(4.04)	(2.74)	(2.39)
Real GDP per capita (begin of period) (log)		0.03	0.06**	0.07**	-0.07	-0.08*
		(0.97)	(2.67)	(3.99)	(1.78)	(1.76)
Real GDP per capita (begin of period) (log)*Coup success		-0.09*	-0.15***	-0.11**	-0.18**	-0.15**
		(2.15)	(3.75)	(3.31)	(2.70)	(2.43)
Affinity with Cold War superpower			-0.10**	-0.10**	-0.10**	
			(3.34)	(2.57)	(3.18)	
General dummy			0.04	-0.02	-0.04	
			(0.33)	(0.26)	(0.33)	
Mid-range officer dummy			-0.07	-0.14	-0.06	
			(0.66)	(1.13)	(0.85)	
Sergeant dummy			-0.11	-0.13	0.00	
			(1.02)	(0.80)	(.)	
Royal leader dummy			-0.04	-0.27	-0.21	
			(0.28)	(1.18)	(1.00)	
Investment (% of GDP)					0.01*	0.01***
					(2.31)	(2.74)
Population (log)					0.00	-0.01
					(0.00)	(0.30)
Secondary school enrolment (% of pop)					0.01**	0.01***
					(2.48)	(3.19)
Constant	0.15*	-0.05	-0.18	-0.31	0.51*	0.50
	(2.09)	(0.24)	(1.40)	(1.48)	(2.41)	(1.29)
Observations	118	118	112	79	86	86
R-Squared	0.01	0.03	0.08	0.12	0.23	0.22

Notes: robust standard errors in parentheses, * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level. Columns 1-6 are estimated using OLS.

In column 1, the results are shown of a model without any control variables. We find that the effect of leadership change on economic growth after a successful coup is positive, but not significant. When we interact the coup success variable with the level of economic development to take into account convergence effects, we find that coup success becomes significant (for $ln(GDPCAP) = 0$) and that the interaction term is negative and significant. This suggests that successful coup attempts have a positive effect on economic growth in poor countries (compared to failed coup attempts) and that the effect gets smaller as countries grow richer. In column 3, we include the determinants of coup success into the model to take account of potential selection bias on the treatment. Although our controls are largely insignificant, the significance of the parameters related to coup success becomes more pronounced. In other words: when we focus on the exogenous variation in the outcome of a coup attempt, we find that leadership changes do have an effect on economic growth. In column 4, we estimate the same model, but here we restrict our sample to leaders that have remained in power during the entire decade after their

successful coup. We do this to check whether the results are affected by cases in which the new leader after a successful coup is replaced for reasons other than another coup d'état. Although we lose some observations the results are qualitatively the same as in the previous specification. In column 5, we also include a number of control variables that are often suggested in empirical models of economic growth. These variables are: investments as a share of GDP, secondary school enrollment, and the size of the population (in log). The inclusion of additional growth determinants improves the explanatory power of the model, but does not affect the results for the impact of leadership change. Finally, in column 6, we consider a Heckman two-step approach, where we treat the determinants of coup success as predictors (instruments) of the outcome of a coup attempt (results are suppressed) and use the predicted values in the second step to estimate the leadership change effect on economic growth.[15] Whatever approach is taken, the results of the different specifications are highly similar.[16]

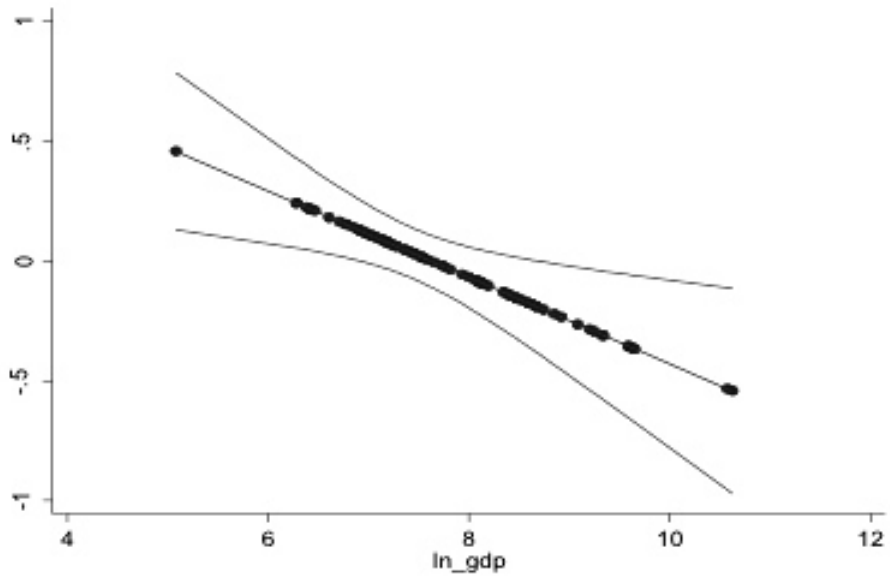
In Figure 2, we plot the marginal effect of a leadership change on economic growth using specification 5 of our model.[17] Apart from the marginal effect, the figure also shows the 95% confidence interval.

[15]Due to the non-linearity of the model, it is also possible to include the instruments of the first stage as control variables in the second stage. When we follow this approach, we find similar results as reported in the table.

[16]In fact, a Likelihood Ratio test on the independence of the two equations of the Heckman approach cannot be rejected at the conventional significance levels ($Chi^2(1)$=0.41, p=0.52). Hence, it is not surprising that the results do not depend on the estimation method.

[17]In fact, specifications 2-6 all lead to the same conclusion.

Figure 2: Marginal effect of a leadership change after a coup d'état on economic growth



Note: the figure shows the marginal effect of the impact of leadership change after a coup d'état on economic growth (vertical axis) for different values of GDP per capita (horizontal axis). Furthermore, the 95% confidence interval is plotted. The dots refer to all observations included in the sample.

The figure illustrates that, indeed, leadership changes after a successful coup have a positive effect when a country is (relatively) poor and that the effect diminishes (and becomes insignificant) as countries grow richer. Strikingly, for the richest countries in our sample, leadership changes after a coup d'état have a negative and significant effect on economic growth.

To further check the robustness of our main result, we vary the number of years of the economic growth period under consideration. Naturally, the number of observations that can be included in the analysis increases when the growth periods become smaller and decreases when these periods become larger. The qualitative results are shown in Table 2.

Table 2: Robustness checks for various growth periods

Growth period after coup success	Low GDP	High GDP	Obs.
1	+*	-	325
2	+**	-*	249
3	+*	-	214
4	+*	-	187
5	+*	-	168
6	+	-	150
7	+**	-	137
8	+**	-	125
9	+**	-**	116
10	+**	-**	112
11	+**	-**	103
12	+**	-**	96

Note: The table reports the result of estimates based on specification 2 of Table 1. The first column indicates the economic growth period we consider after a coup attempt. The second column shows the sign and significance of the estimated marginal effect whenever real GDP per capita is low (below median). The third column shows the sign and significance of the estimated marginal effect whenever real GDP per capita is high (above median). + indicates a positive marginal effect, - indicates a negative marginal effect. *=significant at the 10% level, **= significant at the 5% level. The last column shows the number of observations used in the analysis.

For almost all specifications we find that a change in the political leader after a coup d'état has a positive effect on economic growth when GDP per capita is relatively low. However, the negative effect that is found for rich countries becomes consistently negative and significant for growth periods longer than eight years. Since, we are especially interested in the long-term growth effects of leadership changes, we conclude that our main result is not driven by the selection of the growth period after a coup attempt. Yet, it should be noted that the longer the period is without another coup attempt, the more stable a country has become. Therefore, the longer growth periods give a more accurate indication of the long-term growth effect of a leadership change as a result of coups d'état.

4 Coups success and the determinants of economic growth

The reported results naturally raise the question of why leadership change after a successful coup attempt is able to trigger economic growth in poor countries while the same type of change in rich countries fails to do so. As discussed above, one reason could be

the so-called convergence hypothesis that predicts that poor countries grow faster than rich countries. Another possible explanation is that poor and rich countries differ in their economic structures and therefore the determinants of economic growth are affected differently. Acemoglu and Robinson (2006, chapter 9) suggest that economic structures strongly influence the tradeoff between democracy and non-democracy for political leaders as they influence the costs of coups and the costs of repression. The reason is that capital (be it physical or human) has a higher elasticity of supply relative to land. Furthermore, Finer (1976) argues that a coup d'état breaks down complex economic relations (such as trade). Naturally, these relations are more prevalent in capital-intensive economies. When a coup attempt is undertaken with the aim to replace autocracy for democracy, the elite will not try to withstand it as the costs of repression are high and capital can migrate. In conclusion, we therefore expect that successful coups in capital-intensive economies will have a negative effect on capital accumulation and trade, but will have a positive effect on democratization. In land-intensive economies, on the other hand, landowners have more to lose since in a democracy their land will definitely be taxed. They have an incentive to use force to switch back to autocracy as quickly as possible.

To examine to which extent these determinants of economic growth are affected by leadership changes after a coup d'état, we estimate two-way ANOVA regression models to evaluate the impact of leadership change after a coup d'état. We use a dummy variable *above_median* that is equal to 1 if income per capita in the country under consideration is above the sample median in the year of the coup attempt and 0 otherwise. We conjecture that countries with above median income per capita are, on average, more capital intensive than those with below median income per capita. We examine the change of the different suggested dependent variables (Y) over the 10 years after the coup attempt and include an interactive term between our coup success variable ($Coupsuccess$) and the dummy variable ($above\_median$). The model is:

$$\begin{aligned} Y_{t+10} - Y_t = \beta_0 + \beta_1 Coupsuccess_t + \beta_2 above\_median_t \\ + \beta_3 Coupsuccess_t * above\_median_t + \varepsilon_t \end{aligned} \tag{2}$$

The results are reported in Table 3. Apart from the regression results we also report the marginal effects for each group. All the variables under consideration partly explain why poor countries after a successful coup d'état grow faster than richer countries. In line with our expectations, we observe that successful coups in more developed countries induce democratization, while successful coups in less developed countries induce autocracy. In

column 2 we examine the impact on investment. We observe that rich countries see their investment levels decline, while there is no such an effect in poor countries. A similar result is found for trade, which is reported in column 3. Interestingly, we find in column 4 that human capital levels are not affected in rich countries, but do increase in poor countries. This finding is somewhat remarkable as we expected that human capital in levels would decline, while we expected no effect in poorer countries. Yet, the finding contributes to the explanation why especially in poorer countries economic growth is higher after a leadership change.

Table 3: Coup success and the changes in the determinants of economic growth

	[1]	[2]	[3]	[4]
Dependent variable:	Democratization	Investment	Trade	Human Capital
Coup success	-1.49	0.75	-0.19	1.50
	(6.83)***	(0.69)	(0.05)	(3.25)**
Above median GDP per capita	0.06	2.56	11.48	3.09
	(0.08)	(1.49)	(1.34)	(2.20)*
Coup success * Above median GDP per capita	6.16	-7.61	-15.17	-0.58
	(5.31)***	(2.89)**	(2.15)*	(0.42)
Constant	0.85	1.39	7.18	1.33
	(3.95)***	(3.57)**	(4.19)***	(3.71)***
Marginal effect of coup success	-1.49	0.75	-0.19	1.50
in countries with below median income	(6.83)***	(0.69)	(0.05)	(3.25)**
Marginal effect of coup success	4.67	-6.85	-15.36	0.91
in countries with above median income	(4.69)***	(2.84)**	(2.13)*	(0.70)
Observations	106	118	118	71
R-squared	0.13	0.07	0.03	0.09

Notes: robust standard errors in parentheses, * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level. All specifications are estimated using OLS. Marginal effects and corresponding standard errors are calculated using the method of Brambor et al. (2006). Descriptive statistics and data sources of the dependent variable can be found in Appendix A.

5 Concluding remarks

We find that the economic growth rate in the decade after a leadership change due to a coup d'état is significantly different from the economic growth rate in countries where a coup attempt failed. Yet, this effect is conditional on the development level of the economy. The poorest countries have higher growth rates in the decade after the leadership change, while richer countries have lower growth rates in the decade after a successful coup. This effect is robust to the inclusion of the determinants of coup success as well as

standard explanatory variables of economic growth and holds also for shorter and longer periods of economic growth.

The results are in line with the convergence hypothesis that poor countries grow faster than richer ones. However, the model of Acemoglu and Robinson (2006) suggests that another explanation may be that the economic structures of rich and poor countries differ and that the effect of coups may be different for different economic structures. Our empirical test of the implications of this model offer support for this view.

Our results confirm the finding of Jones and Olken (2005) that leaders do matter. Our analysis, however, adds additional insight that political leaders also matter in political unstable countries. Politically unstable countries often have to cope with low economic growth rates and as Loodregan and Poole (1990) put it might be in a "coup trap". Yet, our evidence shows that economic growth is larger when coup attempts succeed than when they fail.

Appendix A: Descriptive statistics

Coup success sample						
Variable	Obs	Mean	S.D.	Min	Max	Source:
Coup success	452	0.49	0.50	0	1	Powell and Thyne (2011)
Alignment with Cold War superpower	422	0.57	0.37	0	1.28	see Note (3)
GDP per capita (log)	394	7.81	0.85	5.08	11.36	PWT 6.3
General dummy	452	0.25	0.43	0	1	see Note (1)
Mid-range officer dummy	452	0.52	0.50	0	1	see Note (1)
Sergeant dummy	452	0.02	0.13	0	1	see Note (1)
Reported deaths during attempt (dummy)	452	0.50	0.50	0	1	see Note (1)
Royal leader dummy	452	0.02	0.15	0	1	see Note (1)
Cold war dummy	452	0.80	0.40	0	1	
Civilian leader dummy	452	0.07	0.25	0	1	see Note (1)
Military regime	416	0.27	0.44	0	1	Cheibub et al. (2010)
Military expenditures (% of GDP)	357	6.98	18.16	0	282.24	see Note (2)
Military size (% of population)	424	0.01	0.01	0	0.04	see Note (2)
Election dummy	418	0.21	0.41	0	1	Banks and Wilson (2007)
Population (log)	439	8.79	1.36	4.12	11.91	PWT 6.3
Economic growth	389	-0.55	8.51	-65.08	32.70	PWT 6.3
Ethnic fractionalization	441	0.54	0.26	0	0.93	Alesina et al. (2003)
Civil war dummy	428	0.08	0.27	0	1	Gleditsch et al. (2002)
French legal origin	443	0.72	0.45	0	1	Hadenius and Teorell (2005)
Duration of previous regime	434	9.22	13.71	0	100	Marshall and Jaggers (2008)
Democracy dummy (Polity2>5)	452	0.21	0.41	0	1	Marshall and Jaggers (2008)
Autocracy dummy (Polity2<5)	452	0.46	0.50	0	1	Marshall and Jaggers (2008)
% of previous successful coup attempts	452	0.44	0.37	0	1	Powell and Thyne (2011)
Number of previous failed coup attempts	452	1.78	2.46	0	12	Powell and Thyne (2011)
Number of previous successful coup attempts	452	1.87	2.06	0	11	Powell and Thyne (2011)
10 year economic growth model						
Variable	Obs	Mean	S.D.	Min	Max	Source:
Coup success	143	0.47	0.50	0	1	Powell and Thyne (2011)
Alignment with Cold War superpower	6398	0.62	0.38	0	1.71	see Note (3)
GDP per capita (log)	8164	8.48	1.14	5.04	11.61	PWT 6.3
General dummy	10726	0.00	0.07	0	1	see Note (1)
Mid-range officer dummy	10726	0.01	0.08	0	1	see Note (1)
Sergeant dummy	10726	0.00	0.01	0	1	see Note (1)
Reported deaths during attempt (dummy)	143	0.48	0.50	0	1	see Note (1)
Royal leader dummy	143	0.04	0.18	0	1	see Note (1)
Cold war dummy	10726	0.69	0.46	0	1	Own calculations
Investment (% of GDP)	8164	21.55	13.15	-18.87	105.68	PWT 6.3
Population (log)	10726	8.15	2.08	1.98	14.09	PWT 6.3
Economic openness	8164	74.29	51.29	1.09	622.63	PWT 6.3
Secondary school enrolment	7461	25.32	17.19	1.02	76.80	Barro and Lee (2013)
10-year economic growth rate (average)	6303	0.18	0.31	-2.25	3.18	PWT 6.3
Coup success * GDP per capita (log)	137	3.55	3.93	0	11.36	Own calculations

Notes: (1)the combined source includes www.keesings.com, Marshall and Marshall (2007), The New York Times, and www.wikipedia.org.
(2)COW dataset on National Material Capabilities v3.02. (3)Voeten and Merdzanovich (2009).

Appendix B: The determinants of coup success

Dependent variable: Coup success	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Alignment with Cold war superpower	-1.256	-1.249	-1.228	-1.149	-1.212	-1.331	-1.245	-1.175	-1.219	-1.291	-1.238	-1.246	-1.252	-1.258	-1.253	-1.249	-1.247	-1.221	-1.157
	(3.24)***	(3.68)***	(3.63)***	(3.31)***	(3.56)***	(3.97)***	(3.62)***	(3.41)***	(3.57)***	(3.75)***	(3.53)***	(3.66)***	(3.60)***	(3.70)***	(3.69)***	(3.67)***	(3.67)***	(3.57)***	(3.30)***
GDP per capita	-0.958	-0.731	-0.728	-0.729	-0.795	-0.726	-0.677	-0.741	-0.718	-0.784	-0.746	-0.717	-0.775	-0.764	-0.718	-0.749	-0.645	-0.736	-0.689
	(3.22)***	(4.46)***	(4.39)***	(4.26)***	(4.72)***	(4.34)***	(4.18)***	(4.42)***	(4.43)***	(4.56)***	(4.37)***	(4.23)***	(4.58)***	(4.56)***	(4.35)***	(4.38)***	(3.78)***	(4.45)***	(4.14)***
General dummy	3.204	2.313	2.714	2.450	2.361	2.452	2.349	2.498	2.336	2.346	2.402	2.318	2.511	2.310	2.321	2.318	2.400	2.375	2.558
	(5.16)***	(5.65)***	(5.08)***	(5.73)***	(5.59)***	(5.89)***	(5.78)***	(5.80)***	(5.63)***	(5.73)***	(5.65)***	(5.67)***	(5.82)***	(5.64)***	(5.64)***	(5.68)***	(5.80)***	(5.80)***	(5.88)***
Mid-range officer dummy	1.412	0.881	1.282	0.997	0.875	0.884	0.862	0.946	0.935	0.927	0.951	0.888	1.082	0.891	0.878	0.888	0.890	0.887	0.938
	(2.58)***	(2.55)**	(2.66)***	(2.72)***	(2.38)**	(2.53)**	(2.54)**	(2.74)***	(2.64)***	(2.67)***	(2.68)***	(2.57)**	(2.90)***	(2.60)***	(2.53)**	(2.58)***	(2.59)***	(2.58)**	(2.76)***
Sergeant dummy	2.824	2.408	2.809	2.518	1.798	2.358	2.362	2.330	2.422	2.507	3.328	2.414	1.897	2.321	2.417	2.430	2.303	2.428	2.275
	(2.56)**	(2.48)**	(2.73)***	(2.48)**	(1.76)*	(2.41)**	(2.47)**	(2.48)**	(2.46)**	(2.57)**	(3.04)***	(2.49)**	(1.85)*	(2.40)**	(2.50)**	(2.51)**	(2.40)**	(2.51)**	(2.48)**
Reported deaths during attempt (dummy)	-0.449	-0.460	-0.455	-0.461	-0.557	-0.428	-0.433	-0.434	-0.422	-0.443	-0.439	-0.467	-0.458	-0.473	-0.459	-0.468	-0.456	-0.489	-0.407
	(1.63)	(1.90)*	(1.88)*	(1.88)*	(2.21)**	(1.73)*	(1.77)*	(1.77)*	(1.74)*	(1.82)*	(1.78)*	(1.93)*	(1.84)*	(1.95)*	(1.89)*	(1.92)*	(1.87)*	(2.00)**	(1.64)
Royal leader dummy	4.219	3.130	3.524	3.317	3.661	3.481	2.958	2.907	3.133	3.302	3.220	3.097	3.379	3.242	3.061	3.197	2.825	3.057	2.710
	(2.35)**	(2.75)***	(2.95)***	(2.86)***	(2.41)**	(2.71)***	(2.76)***	(2.71)***	(2.76)***	(2.55)**	(2.81)***	(2.71)***	(2.90)***	(2.73)***	(2.78)***	(2.80)***	(2.60)***	(2.70)***	(2.70)***
Cold war dummy	0.385	0.654	0.648	0.701	0.633	0.572	0.593	0.705	0.607	0.637	0.570	0.660	0.648	0.705	0.621	0.651	0.603	0.642	0.651
	(0.87)	(1.83)*	(1.81)*	(1.94)*	(1.64)	(1.59)	(1.65)*	(1.92)*	(1.69)*	(1.73)*	(1.55)	(1.85)*	(1.74)*	(1.93)*	(1.73)*	(1.82)*	(1.65)*	(1.77)*	(1.75)*
Civilian leader dummy	0.594		0.927																
	(0.82)		(1.48)																
Military regime	0.364			0.366															
	(1.04)			(1.36)															
Military expenditures (% of GDP)	0.005				-0.024														
	(0.54)				(1.34)														
Military size (% of population)	-13.541					-32.321													
	(0.31)					(1.17)													
Election dummy	-0.509						-0.488												-0.540
	(1.52)						(1.72)*												(1.89)*
Population (log)	-0.003							-0.164											-0.178
	(0.02)							(1.71)*											(1.86)*
Economic growth	0.010								0.009										
	(0.58)								(0.57)										
Ethnic fractionalization	-0.935									-0.583									
	(1.41)									(1.24)									
Civil war dummy	-0.691										-0.336								
	(1.08)										(0.71)								
French legal origin	-0.492											-0.101							
	(1.28)											(0.34)							
Duration of previous regime	0.007												0.011						
	(0.66)												(1.05)						
Democracy dummy (Polity2 > 5)	0.353													0.337					
	(0.83)													(1.13)					
Autocracy dummy (Polity2 < -5)	0.343														0.142				
	(0.96)														(0.59)				
% of previous successful coup attempts	0.011															-0.152			
	(0.02)															(0.46)			
Number of previous failed coup attempts	-0.023																-0.079		
	(0.28)																(1.61)		
Number of previous successful coup attempts	-0.061																	-0.081	
	(0.58)																	(1.46)	
Constant	8.436	4.862	4.433	4.554	5.494	5.050	4.559	6.209	4.733	5.589	4.963	4.829	4.928	5.021	4.720	5.075	4.361	5.050	6.032
	(2.65)***	(3.63)***	(3.25)***	(3.25)***	(4.04)***	(3.89)***	(3.41)***	(3.75)***	(3.55)***	(3.79)***	(3.56)***	(3.60)***	(3.64)***	(3.71)***	(3.45)***	(3.52)***	(3.19)***	(3.70)***	(3.64)***
Observations	324	376	376	366	353	370	370	376	372	375	366	376	367	376	376	376	376	376	370
Pseudo R-sq	0.22	0.18	0.19	0.19	0.19	0.19	0.18	0.19	0.18	0.18	0.18	0.18	0.19	0.18	0.18	0.18	0.19	0.19	0.19
Regional dummies included	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Robust z-statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

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