

# Economic Development and Transitions to Democracy

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## **Abstract**

Transitions to democracy do not become more likely when a country is more developed, as measured by per capita income. In turn, history of past regimes makes a big difference: dictatorships that inherit regime instability, which also tend to emerge at higher income levels and to be headed by military, are distinctively more likely to transit to democracy. The only reason there are so few dictatorships in developed countries is that democracies are more stable at higher income levels.

# 1 Introduction

Are transitions to democracy more likely if countries reach higher levels of economic development? As discussed by Przeworski and Limongi (1997), this question entails the empirical validity of modernization theory, which maintains that democratization is a lawful consequence of a general process of development. The issue is also politically relevant: at stake is whether promoting economic development of dictatorships is an effective policy for leading them to democracy.

Przeworski and Limongi claimed on the basis of data for 1950-90 that while the probability of transition from democracy to authoritarianism,  $p_{DA}$ , monotonically declines in per capita income,  $y$ , the probability of transition to democracy,  $p_{AD}$ , is independent of income. Przeworski, Alvarez, Cheibub, and Limongi (2000) maintained the same, although they also found indications that the probability of transition from authoritarianism to democracy first increases and then declines in per capita income. Yet these conclusions are disputed by Boix and Stokes (2003) as well as by Epstein et al. (2003), and the matter is far from clear.

Below is a descriptive table with the same structure as in Przeworski et

al. (2000), excluding the Gulf countries, but extended to 1999.<sup>1</sup>

\*\*\* Table 1 here \*\*\*

It is so obvious that  $p_{DA}$  monotonically declines in per capita income that I say almost nothing more about this relation in the remainder of the paper<sup>2</sup>. The relation between income and  $p_{AD}$ , however, is not apparent:  $p_{AD}$  increases in per capita income until about \$5,500 and then declines, but there are few dictatorships with incomes above \$5,500.<sup>3</sup> Hence, it is not clear what one should conclude from an eye inspection of these data.

Now, it may be that:

(1)  $p_{AD}$  in fact monotonically increases in  $y$ , but since wealthy dictatorships are few, by chance we observe some outliers and erroneously conclude

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<sup>1</sup>The classification of regimes was extended, using the same criteria as in Przeworski et al. (2000), by IDENTIFYING REFERENCE. The classification of effective heads of governments is taken from IDENTIFYING REFERENCE. The data and the codebook are available at IDENTIFYING REFERENCE. Dictatorships with highest per capita incomes are in the six Gulf oil countries, and it is questionable whether per capita income is a good indicator of economic development when a large part of it is derived from rents. Hence, I will not consider these countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates).in the subsequent analyses. Note that excluding them biases the analysis in favor of finding a positive impact of income on  $p_{AD}$ .

<sup>2</sup>For explanations of why democracies survive in wealthy societies, see Przeworski (forthcoming) and Benhabib and Przeworski (2004).

<sup>3</sup>All income figures are in 1985 purchasing power parity dollars.

that above some income, transitions to democracy become less likely. This is the assertion of Boix and Stokes (2003).

(2)  $p_{AD}$  does have a maximum with regard to  $y$ : up to a certain income, development breeds democracies but wealthy dictatorships are stable. This is the claim of Przeworski et al. (2000), insufficiently analyzed there<sup>4</sup>.

(3)  $p_{AD}$  does not directly depend on income. There are some other factors that affect these transitions and the distribution of these factors is a function of income. Once these factors have been identified, income plays no role.

My purpose is narrow. I do not try to develop a theory of transitions to democracy; indeed, I argue that these processes may be too amorphous to be theorized. Hence, I do not review the immense literature concerning this topic. All I examine is the role of economic development. And since this narrow issue is sufficiently complex, all kinds of methodological problems pop up.

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<sup>4</sup>Having complained about the small number of wealthy dictatorships, Boix and Stokes do not hesitate to draw conclusions about them (see their Table 5 and the discussion thereof).

## 2 Framework of analysis

To introduce the framework of analysis, let  $p_{ij}(t)$  be the probability that the regime of country  $i \in I$  is  $j \in \{A, D\}$  in year  $t > 0$ , where  $A$  stands for "authoritarianism" and  $D$  for "democracy." Then, dropping the  $i$  subscript,

$$p_A(t) = p_{DA}(t-1)p_D(t-1) + [1 - p_{AD}(t-1)]p_A(t-1),$$

$$p_D(t) = [1 - p_{DA}(t-1)]p_D(t-1) + p_{AD}(t-1)p_A(t-1).$$

Now, let

$$p_{DA}(t) = F(Z_t\alpha)$$

and

$$p_{AD}(t) = F(X_t\beta),$$

where  $Z$  is the vector of variables that affect transitions to authoritarianism,  $X$  are the variables that affect transitions to democracy ( $Z$  and  $X$  may or may not be the same), and  $F(\cdot)$  is the cdf of some distribution. I will refer

to this framework as the "Markov model."

We want to study the function  $p_{AD}(y)$ , where, to remind,  $y$  stands for per capita income. Estimating the model by probit (or logit, it makes no difference) yields the results presented in Table 2.<sup>5</sup> Since the mass of observations is in poorer countries, where the slope is positive, the global estimate of  $\beta$  is positive (see column 1). We can go on and to test quadratic (unrestricted) versus linear (restricted) specifications of the index function, that is, to estimate

$$p_{AD} = F(\beta_0 + \beta_1 y + \beta_2 y^2),$$

letting  $F$  to be normal and testing the constraint  $\beta_2 = 0$ . The results (in column 2) show that the coefficient on the squared income term is negative although not significant ( $t = -1.265; p = 0.2059$ ), which is not very informative: the quadratic term appears to matter, suggesting that the function has a maximum, but its effect is not significantly different from zero.

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<sup>5</sup>There are three equivalent ways of estimating this model: (1) maximize the likelihood derived from the Markov model in the text, (2) use canned probit (logit) defining transition probabilities with a shift, as in Amemyia (1985: 424), Przeworski et al. (2000: Appendix 2.1), and Boix and Stokes (2003), or (3) simply divide the sample according to lagged regimes and estimate separately, again by probit (logit) the transitions away from the lagged regime. All these methods will estimate what Beck et al. (2001) call the "full transition" model.

\*\*\* Table 2 here \*\*\*

Since the entire issue hinges on the inferences we are willing to make about dictatorships in wealthy countries, where observations are scarce, global estimators are of little help (Hastie and Tibshirani 1990): we need the estimate of the slope of the function  $p_{AD}(y|y = high)$ , which also calls for estimating local standard errors. Non- or semi-parametric smoothing estimators show negative slopes at high income levels. A loess smooth is shown in Figure 1. The local confidence intervals (95%, indicated by vertical bars), however, become very large as income increases, so that the estimates at higher incomes are unreliable. Hence, there is still little we can conclude from these results. It appears that given the data we cannot tell whether transitions to democracy are somewhat more likely in countries with higher incomes or more likely in countries with middle income levels than at lower and higher incomes.

\*\*\* Figure 1 here \*\*\*

Yet the entire Markov model is based on an assumption which is flagrantly wrong, namely, that the transition probabilities do not depend on past history, only on the current income, namely, that

$$\begin{aligned} \Pr\{\textit{regime} = k \textit{ at } t | \textit{regime} = j \textit{ at } t - 1, X\} &= p_{jk}(X) \\ &= \Pr\{\textit{regime} = k \textit{ at } t | \textit{regime} = j \textit{ at } t - 1, X | \textit{regimes at } t - \tau, \tau > 1\}. \end{aligned}$$

That the assumption of Markov independence is violated is best seen by comparing the transition matrices for the current regimes in those countries which at any time in the past experienced a transition to authoritarianism and those countries where no such event ever occurred. Note that since at some more or less distant time in the past all regimes were authoritarian (or were ruled by other countries), the latter cases are those where the regime either remained authoritarian or became a democracy and remained democratic until the current observation. In the subsequent analysis, I refer to the variable that counts the number of times democracy died in the past as STRA (the mnemonic is Sum of Transitions to Authoritarianism).<sup>6</sup> Here is the matrix of transition probabilities conditioned on past history.

\*\*\* Table 3 here \*\*\*

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<sup>6</sup>There observations are not left-hand censored, meaning that we have information about history before a country enters the data set. For example, the communist regime in Czechoslovakia enters the same in 1950 with STRA=1.

These probabilities are startlingly different and, indeed, the hypothesis that they are the same is rejected with almost certainty (the  $\chi^2$  test is given by Goodman 1962). If they do not appear so, just note that in a country which never experienced democracy in the past, the current dictatorship can expect to live eighty-three years, while in a country which had at least one democracy at any time in the past, it can expect to last only fourteen years.<sup>7</sup> History matters for the stability of current regimes.

Probit estimates (in col.3 of Table 2) indicate that having experienced transitions to authoritarianism in the past makes both regimes less stable. Hence, regime instability feeds on itself, as in Londregan and Poole (1990). The most important implication of this fact is that the estimates presented in the first two columns of Table 2 are biased by the omission of the previous regimes. How serious is this bias becomes apparent when we introduce STRA into the specification of the model. While the coefficient on income (GDP/cap) in the equation explaining failures of democracy,  $p_{DA}$ , remains almost unchanged and is still highly significant, the coefficient in the equation for  $p_{AD}$  falls to zero. Non-parametric estimate (general additive model with cubic spline smooth for income and linear STRA) shows the same: while for

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<sup>7</sup>Under exponential distribution, expected life is the inverse of the transition probability.

STRA  $\chi^2 = 17.28$  with  $p(\chi^2) = 0.0006$ , for GDP/cap  $\chi^2 = 1.99$ ,  $p(\chi^2) = 0.56$ .

Since the Markov model is the work horse in recent estimates of dynamic processes, not only of regime transitions but also of onsets of foreign wars and ethnic conflicts, one can only wonder how often we are faced with biased estimates.

Note that the constant terms are almost unaffected by introducing past history, while the coefficient on income in  $p_{AD}$  is, which must mean that current income and past transitions to authoritarianism must be highly correlated: dictatorships with high incomes must inherit more regime instability. This is, then, what we need to investigate.

### **3 Past events**

Since the story I am about to recount is complex, let me preview the part that follows in this section. Dictatorships that emerge in relatively more developed countries have shorter lives. The reason is not necessarily that they are harder to consolidate when countries are more developed: it turns out that when dictatorships emerge in more developed countries they inherit a more unstable past and that past instability feeds current instability. Hence,

the first part of the story is that dictatorships established at higher income levels inherit more instability, past instability makes them more vulnerable, and as a result their lives are shorter.

Conditional on the initial income, development under dictatorship does not undermine the stability of these regimes. This finding flies in the face of modernization theory: if transitions to democracy are more likely at higher levels of development, then one should observe that, at least if a dictatorship emerged at a high income level, those dictatorships that increased income more should be more likely to die. If anything, just the opposite is true. Hence, even if dictatorships that are established at higher income levels are less stable, development consolidates them.

Here, step-by-step, is the evidence:

(1) *Dictatorships that emerge in relatively more developed countries are more likely to die.* Let the time when a dictatorship emerges be  $T$  and let us index the age of dictatorship by  $s$ . Then, we can write the current income as

$$y_{T+s} = y_T + (y_{T+s} - y_T) = y_T + \Delta_{T,T+s}y_s.$$

In terms of variable names,

$$GDP/cap = INILEV + DIFLEV.$$

Figure 2 shows a loess smooth (and 95% confidence intervals) for  $p_{AD}$  as a function of the initial income (INILEV) at which a dictatorship emerged.<sup>8</sup>

\*\*\* Figure 2 here \*\*\*

Transitions to democracy are more likely for those dictatorships that emerged at higher income levels.

(2) The reason is that *dictatorships that emerge in relatively more developed countries inherit more regime instability and past instability makes the current regimes less stable.*

\*\*\* Table 4 here \*\*\*

Column 6 of Table 4 shows the average per capita income during the year when dictatorships emerged as a function of STRA. Countries which experienced past transitions to authoritarianism are more likely to see dictatorships arise at higher income levels.

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<sup>8</sup>Note that the initial income is left-censored: while we know all the dates when the particular regimes emerged, we have no income data for the pre-1950 period. In Figure 2 the initial income is taken as the income of a dictatorship when it emerged or as of 1950, whichever comes later.

Column 5 of Table 4 shows the relation between the past and present regime instability. As we see, most of the action occurs between no past democracy and just one completed spell. Higher levels of past instability appear to have some additional impact but, since such observations are few, standard errors are large.

(3) *Conditional on the initial income, development under dictatorship does not make these regimes more likely to die.* This is the crowning piece of evidence against modernization theory, at least the Lerner-Lipset version of it, which is at stake here. The modernization, or "endogenous transition," theory asserts that transitions to democracy are more likely in more developed countries, which we take throughout to be countries with higher per capita income. The question, then, is whether dictatorships are more likely to fall as economies develop. But to answer this question, we need to sort out the effect of the initial income (and, thus, past regime instability) from the development that occurred under a dictatorship.

Examine Figure 3, a loess plot in which the effect of development under dictatorship on the probability of transition is conditioned on the income under which this dictatorship emerged.<sup>9</sup> The lower panel portrays the impact

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<sup>9</sup>Created in S+ by TAD ~loess(INILEV\*DIFLEV).

of development under a dictatorship on transitions, given the income under which this dictatorship emerged, divided into six groups with the initial income increasing from left to right and from the bottom up,. The result is startling: while in countries where dictatorships emerged with lower incomes (bottom panels), subsequent development has no discernible effect, in those countries where dictatorships were established at higher income levels (upper panels), subsequent development has an unambiguous and rather strong effect in making them more stable.

\*\*\* Figure 3 here \*\*\*

Probit estimates (see Table 5) show development under dictatorship to be just irrelevant for the probability of transition. The effect of the initial income, in turn, hides the role of past regime instability: once STRA is introduced into the specification, this effect vanishes. Hence, the stability of dictatorships is determined almost exclusively by the history they inherit, while subsequent development appears make them more stable in those countries that inherited a more unstable past – where dictatorships emerged with higher initial incomes – and irrelevant elsewhere.

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\*\*\* Table 5 here \*\*\*

To summarize the story again, dictatorships that emerge at higher income levels inherit more instability, which in turn makes them less stable. But if they generate development, they are more, not less, likely to survive. In poorer dictatorships, development appears to be simply irrelevant for their stability.

## 4 Duration dependence

The mere fact that there are few dictatorships in developed countries tells us nothing about the relation between development and the durability of dictatorships. We have to guard ourselves against the following fallacy. Suppose that every year you run a 0.016 chance of being killed by a brick falling from a tall building. You happily live eighty years and then, when you are eighty, a brick does fall. Contrary to appearances, you will not have died of old age. Yet this is the way many people, Boix and Stokes (2003) included, think of the role of development. Taiwan developed under an authoritarian regime, reached in 1996 the income of \$10,610, and transitioned to democracy. But this is not yet evidence of the role of income. By 1996, the Taiwanese regime

was forty-seven years old. If at the time it was born this regime had a 0.016 chance of dying in any year – this is the average probability of dictatorships dying with income below \$1,000– it would have had only a 47 percent chance of surviving past the age of forty-six *even if it had remained as poor as it was in 1949*. Indeed, to my mind the Taiwanese regime decided to hold elections because it needed to mobilize the support of democratic countries in its geopolitical conflict with China, a reason that has nothing to do with income. In East Germany, the second wealthiest dictatorship fell in 1990 because the dictatorship fell in the Soviet Union. Spain, where the fourth wealthiest dictatorship fell in 1977, faced a crisis caused by the death of the founding dictator and the pressure to join Europe, for which democracy was a prerequisite. In Venezuela, the sixth wealthiest, dictatorship fell in 1958 because the United States turned against it. I can go on, since one can always find a specific reason. So the question is whether dictatorships fall in wealthier countries because of their development or because the longer they live, the more hazards they accumulate.

Yet duration dependence – the dependence of the probability that a dictatorship would die on its age – does offer a hypothesis rival to the role of income. If transitions to democracy are less likely when dictatorships grow

older and if their income increases with their age, we would mistakenly conclude that they have more stable in the more developed countries because of their income, rather than their age. Moreover, as we know from Heckman (1991), negative duration dependence cannot be distinguished from unobserved heterogeneity: it may be that dictatorships differ in their inherent stability; those intrinsically unstable die quickly; while those that are inherently stable survive and develop. Suppose that dictatorships face some chance of dying during a particular year for purely idiosyncratic reasons: death of the founding dictator, geopolitical crisis, defeat in a war, foreign pressures, economic disaster, a shift of policy of the United States or the Soviet Union, etc. Suppose, moreover, that they differ in their inherent vulnerability to such events. Then such heterogeneity would account for the positive relation between survival and development.

Hence, we must worry about duration dependence and about heterogeneity, beginning with the latter. Fortunately, there is one obvious source of heterogeneity: extensive literature documents that the military frequently take over with a transitional mission of "reestablishing order" and then withdraw back to the barracks (Finer 1976, Nordlinger 1977, Permlutter 1977). Indeed, dictatorships headed by professional military have shorter lives and exhibit

a different pattern of duration dependence from those headed by civilians. Note in Figure 4 (cubic spline smooths) that at its peak, at the age of sixty, the probability that a civilian dictatorship would die is not higher than the probability that a military dictatorship would die at almost any age. Moreover, civilian regimes are born stable, become unstable after several decades, and then become somewhat more stable again. The military ones, in contrast, are born unstable and only if they make it through the first few years, do they consolidate.

\*\*\* Figure 4 here \*\*\*

Yet the military status of a dictatorship adds little information to what we already know. The first reason is that military dictatorships tend to emerge at much higher income levels than the civilian ones. Since our income data begin in 1950 and do not cover all countries, we do not know the initial income of all dictatorships. But the average initial income of the fifty nine civilian dictatorships for which we have the data was \$1,058 (with a maximum at \$2,603 for Fiji in 1970), while the average income initial income for thirty-seven military regimes was \$2,073 (with a maximum at \$5,801 for Argentina in 1976). Indeed, the ten dictatorships that emerged at highest

income levels were all military. Hence, knowing that a regime is military does not inform us of much more than that it emerged in a country with a higher income. Secondly, we already know that dictatorships inherit more instability when they emerge at higher income levels. And past regime instability tends to generate military dictatorships: Fujimori's dictatorship in Peru was the only civilian regime with  $STRA > 1$ , while twenty-two military dictatorships inherited more than one past democracy. (The crosstab is in Table 4).

Now that we know something about a potential source of heterogeneity,<sup>10</sup> we can return to duration dependence. Survival models are a dozen: one can estimate them using duration or annual data (Alt, King, and Signorino 2000), semi-parametrically (Cox proportional hazards) or parametrically, assuming a variety of distributions. Determining which survival model is best is nothing obvious. The generalized F distribution nests most other distributions (Kalbfleisch and Prentice, 1980, Section 3.9) but it cannot be estimated given our data structure. Moreover, since by the time of their first observation several regimes were already old,<sup>11</sup> we need to consider the fact that had

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<sup>10</sup>It may be the only source. A Weibull survival model shows the presence of gamma heterogeneity but including the variable that indicates the military status of the dictator (EMIL) eliminates it.

<sup>11</sup>Some countries were ruled by dictatorships since time immemorial. We begin counting

a dictatorship failed before the truncation time, that regime would not have been observed. Therefore, any contribution to the likelihood must be conditional on the truncation limit having been exceeded (Cox and Oakes 1984: 177-178), which can be incorporated only into some survival distributions. Table 6 shows the results for the Cox model based on duration data without left truncation or time varying covariates, the loglogistic model based on duration data with left truncation but no time varying covariates, and the loglogistic model with time varying covariates but without left truncation.<sup>12</sup>

\*\*\* Table 6 here \*\*\*

All this may be unnecessary hair-splitting, since the results are robust. The coefficient on per capita income is invariably positive, although not significant with duration based data. Hence, either income is irrelevant or dictatorships are more likely to survive in wealthier countries. STRA is perfectly robust and has a large coefficient: past regime instability shortens the lives of current dictatorships. Military regimes are less likely to survive, although the

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ages in 1871, so that several regimes enter the sample in 1950 at the age of 78.

<sup>12</sup>Ideally, one would want to estimate a model with time varying covariates and left-truncation. But, given that we have no data for income before the first observation, this cannot be done. One must make trade-offs: in the duration based models, the regressors enter only at the time the regime dies, while in the model based on the annual data there is no correction for left-truncation. Hence, my strategy was to estimate several non-nested models and to see if the results are robust.

coefficient on EMIL is significant only in the semi-parametric model. Hence, conclusions are identical to those we derived without considering duration dependence.

Considering the military status of dictatorships, however, adds a final wrinkle to the story. When dictatorships are considered separately, conditional on STRA, the coefficient of income in the loglogistic duration based model for the civilian regimes is 0.1434 (*s.e.* = 0.0795), while for the military regimes it is  $-0.0770$  (*s.e.* = 0.1339).<sup>13</sup> Hence, it is the civilian dictatorships that are more likely to survive at higher income levels, while for the military ones income makes no difference.

## 5 Final story

In the end, the only systematic pattern of transitions to democracy concerns a handful of dictatorships that inherited a fair dose of instability, were led by the military (except for Peru under Fujimori), and, emerged at relatively high income levels (except for Sudan). These military dictatorships came to power to thwart the threat of popular mobilization (O'Donnell 1973) and, even if

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<sup>13</sup>Estimations based on annual data, which do not correct for left truncation but allow time varying covariates, show an even stronger effect for civilian dictatorships and still none for the military ones.

each regime experienced internal tensions between those who wanted to found a permanent authoritarian order and those who wanted only to restore the pre-existing capitalist order, the latter gained an upper hand, often with the support of the respective bourgeoisies. None of these regimes generated much development and they all died at income levels well below those of some civilian dictatorships. Indeed, the highest income ever reached by a dictatorship headed by a military was \$7,294 (Spain under Franco in 1974), while six civilian dictatorships survived a total of thirty-seven years at higher incomes (several years in Singapore, Taiwan, East Germany, and the Soviet Union, plus a single year in Iraq and Malaysia). The mountain in Figure 5 consists of these high-entry-income military regimes with an unstable past, while the small ridge at lower income levels reflects Sudan.<sup>14</sup> The rest of the surface is almost flat, even if it is divided by a ripple that goes diagonally from middle income with high instability to high income with no past instability.

\*\*\* Figure 5 here \*\*\*

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<sup>14</sup>They are, in increasing income levels, Turkey (ENTRY YEAR=1980, STRA=1), Greece (1967, 2), Chile (1973, 2), Thailand (1991, 2), Suriname (1980, 1), Uruguay (1973, 1), and Argentina (1955, 2; 1962, 3; 1966, 4; 1976, 5).

Here then is the story. Let democracy be defined by two characteristics: (1) The government is not formally responsible to some non-elected power (the Crown, House of Lords until 1911, military, Council of Faith, a foreign government) and (2) The incumbent government can be defeated under the same rules under which it has been elected. This definition yields the dating of democracies found in Przeworski et al. (2000: Table 2.8) and extended to 1999 here. Suppose we were to begin in 1750, when there were no democracies by this definition. All countries had relatively low incomes and at that time there was relatively little cross-country income dispersion. Some countries grew; others stagnated. Random events – those that we did not observe systematically at least here – generated some democracies. Where the dice had fallen on countries that already had higher income, democracy was more likely to endure. Where they had picked countries with still low incomes, democracy was likely to fall and the country would accumulate a transition. Past regime instability made both regimes less stable, so that countries became heterogenous. Those with high past instability were taken over by the military, who did not stay long. In politically more stable countries, civilian dictatorships endured. Hence, after a long time we observed some stable dictatorships in developed countries. If they eventually died, it

was because of hazards independent of income.

In the meantime, new countries appeared, typically with very low incomes. Either they were born as dictatorships or democracy was likely to fall: democracy is brittle in poor countries. Some of them grew, and their pattern was the same as that of old countries. Most stagnated and they were likely to remain authoritarian.

We do not observe, however, the entire history. The observations we have begin whenever the time series for income becomes available in a particular country, typically in 1950 or the year of independence, whichever comes last. I took the initial regimes as given. Now, as long as countries are homogeneous conditional on the observed exogenous factors, then the initial allocation of regimes makes no difference. But if there are heterogeneous in some unobserved way, then our estimates are inconsistent and they are based on inappropriate standard errors.

What can we do?<sup>15</sup> Not having income data for the pre-1950 period, we can still engage in the following, deliberately crude, exercise. We know from economic historians that income divergence is a phenomenon that post-dates the Industrial Revolution. We also have the estimate that \$250 1985 PPP is about the annual subsistence income (Pritchett 1997: 7). With this knowledge, we can make some rough assumptions. Suppose all countries had per capita income of \$250 in 1750 and that each grew at a constant rate since then so as to arrive at its 1950 income. Take countries that were independent at least as of 1919 and using the calculated growth rates compute their annual incomes since 1750. Assume, committing a minor factual error, that all countries had authoritarian regimes as of 1847. Now throw dice for each regime, conditioning the probability of transition to democracy only on STRA and the probability of transition to dictatorship only on per capita income. If this exercise predicts the distribution of regimes in 1950, we will

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<sup>15</sup>One thing we should not do. Boix and Stokes (2003) construct a time-series for income going all the way back to 1850. Then they estimate transition probabilities separately for the 1850-1949 and 1950-1990 periods. But the highest per capita income in 1949 could not have been much higher than \$4,000 of 1985 PPP international dollars. Hence, although they claim to have avoided "any bias from truncated samples" (page 530), their result is just an artefact of income truncation. They also conduct the analysis for the entire period, which I would have certainly reproduced had I believed the data they use. Unfortunately, the Maddison data they utilize cannot be merged with the data from Penn World Tables: these series share a trend but the common variance of their growth rates is only 0.37. Moreover, I have too many doubts about their early classification of regimes, as listed in Boix (2003), to use it.

have grounds to believe that the pre-1950 period could not have been very different.

I run the simulation 1000 times for each of the forty-six countries and predicted regimes for 1950. Then I regressed (probit) the regimes observed in 1950 on the averages of regimes predicted for 1950 by the simulation for each country. Of the twenty-nine democracies observed in 1950, the simulation correctly predicted twenty-four, while of the seventeen dictatorships that existed in 1950 the simulation correctly predicted thirteen. Hence, assuming that only past instability mattered for transition to democracy and only per capita income for the stability of democracy and that they both mattered the same way as they were observed to after 1950, we get a pretty good prediction of regimes in 1950. There is no reason to think that the pre-1950 period was different from the post-1950 era.

As I emphasized in the Introduction, it was not my intent to consider the full panoply of factors that may affect transitions to democracy. All that I hope to have established is that per capita income does not play a direct role in this process. Once the income at which dictatorships emerge is distinguished from the subsequent development, we learn that dictatorships that emerge at higher income levels inherit more regime instability and tend

to be military. These two traits, in turn, shorten their lives. I do not claim that this is the only reason dictatorships die and the literature is full of candidates for potential causes. But my suspicion is that there are so many possible reasons for dictatorships to die that probably no overarching theory can encapsulate them.

## **6 Why are there so few dictatorships in developed countries?**

Developed countries are democratic, but it is not because development breeds democracy. Think as follows. Given the initial regime  $j$  or  $k$ , history is a particular realization over time (sequence) of binary random variables,  $t_{jk}$ , generated by some probability  $p_{jk}$ . Once history becomes realized, we can calculate ex post frequencies of regimes, conditional on the particular realizations of some other variables. This is indeed what we have done. We have seen that, once established for whatever reasons, democracies are much more likely to survive in more developed countries but we are not certain whether democracies are also more likely to emerge in such countries. Now suppose that the sequence  $t_{DA}(y)$  remains the same across all possible realizations

of history, but the observed sequence  $t_{AD}(y)$  is just a single draw from a variety of potential histories ruled by  $p_{AD}(y)$ . How much difference for the distribution of regimes would it make had we experienced a different history of transitions to democracy?

Now, as  $t \rightarrow \infty$ , the probability that a country will have a democratic regime at any constant income level  $y$  converges to

$$p_D^*(y) = \frac{p_{AD}(y)}{p_{AD}(y) + p_{DA}(y)}.$$

Using the observed frequencies of regime transitions, if all countries remained for a long time within the same \$1,000 income bands, the frequencies of democracies would have been:

\*\*\* Table 7 here \*\*\*

Now suppose that the probability of transitions to democracy had increased monotonically and steeply throughout the entire income range. Indeed, assume in the spirit of modernization theory that once countries reach \$5,000, dictatorships fall for sure,  $p_{AD} = 1$ . The limit distribution of regimes would be almost the same:  $p_D^*$  would be 0.99 between \$5001 and \$7000 and it would still be 1.00 above \$7000. The rate at which democracies survive

in more developed countries is so high that the frequency with which dictatorships fall in such countries affects only the time it would take for all such countries to become democratic, but not that they eventually would.

Now, time certainly matters: many lives would have been better if the expected duration of wealthy dictatorships were zero, instead of twenty some years. But the point is that the observed relation between per capita income and distribution of political regimes is due almost exclusively to the fact that democracies become more durable as countries become more developed, rather than to increased frequency of transitions to democracy.

## 7 References

Alt, James E., Gary King, and Curtis S. Signorino. 2000. "Aggregation Among Binary, Count, and Duration Models: Estimating the Same Quantities from Different Levels of Data." *Political Analysis* 9: 9-39.

Amemyia, Takeshi. 1985. *Advanced Econometrics*. Cambridge, MA: Harvard University Press.

Beck, Neal, and Simon Jackman. 1998. "Beyond Linearity by Default: Generalized Additive Models." *American Journal of Political Science* 42:

596-627.

Beck, Neal, David Epstein, Simon Jackman, and Sharyn O'Halloran. 2001. "Alternative Models of Dynamics in Binary Time-Series-Cross-Section Models: The Example of State Failure." Paper presented at the 2001 Annual Meeting of the Society for Political Methodology, Emory University.

Benhabib, Jess, and Adam Przeworski. 2004. "The political economy of redistribution under democracy." Ms. Department of Economics, New York University.

Boix, Carles. 2003. *Democracy and Redistribution*. New York: Cambridge University Press.

Boix, Carles, and Susan Stokes. 2003. "Endogenous Democratization." *World Politics* 55: 517-49.

Cox, D.R. and D. Oakes. 1984. *Analysis of Survival Data*. London: Chapman and Hall.

Epstein, David L., Robert Bates, Jack Goldstone, Ida Kristensen, and Sharyn O'Halloran. 2003. "Democratic Transitions." Paper prepared for presentation at the Annual Meeting of the Midwest Political Science Association, Chicago, April 3-6.

Finer, Samuel. 1976. *The Man on Horseback: the Role of the Military in*

*Politics*. 2nd edn. Harmondsworth: Penguin.

Goodman, Leo A. 1962. "Statistical Methods for Analyzing Processes of Change." *American Journal of Sociology* 68: 57-78.

Hastie, T.J., and R.J. Tibshirani. 1990. *Generalized Additive Models*. Boca Raton: Chapman&Hall.

Heckman, James J. 1991. "Identifying the Hand of the Past: Distinguishing State Dependence from Heterogeneity." *American Economic Review. Papers and Proceedings*. 81: 75-79.

Kalbfleisch, John D., and Ross L. Prentice. 1980. *The Statistical Analysis of Failure Time Data*. New York: John Wiley&Sons.

Londregan, John B. and Keith T. Poole. 1990. "Poverty, the Coup Trap, and the Seizure of Executive Power." *World Politics* 42: 151-83.

Nordlinger, Eric. 1977. *Soldiers in Politics: Military Coups and Governments*. Englewood Cliffs, NJ: Prentice Hall.

O' Donnell, Guillermo. 1973. *Modernization and Bureaucratic Authoritarianism: Studies in South American Politics*. Berkeley: Institute of International Studies, University of California.

Perlmutter, Amos. 1977. *The Military and Politics in Modern Times: on Professionals, Pretorians, and Revolutionary Soldiers*. New Haven: Yale

University Press.

Pritchett, Lant. 1997. "Divergence, Big Time." *Journal of Economic Perspectives* 11: 3-18.

Przeworski, Adam, and Fernando Limongi. 1997. "Modernization: Theories and Facts." *World Politics* 49:

Przeworski, Adam, Michael Alvarez, José Antonio Cheibub, and Fernando Limongi. 2000. *Democracy and Development*. New York: Cambridge University Press.

Przeworski, Adam. Forthcoming. "Democracy and as Equilibrium." *Public Choice*.

Table 1: Observed Frequencies of Regime Transitions, by Lagged Per Capita Income, Excluding Oil Countries

<i>Income</i>	$p_A$	$t_{jk}$	$n$	$p_{jk}$	$t_{AD}$	$n_A$	$p_{AD}$	$t_{DA}$	$n_D$	$p_{DA}$
-1000	0.90	31	1320	0.0235	19	1185	0.0160	12	135	0.0890
1001 – 2000	0.68	40	1263	0.0317	23	864	0.0266	17	399	0.0426
2001 – 3000	0.57	23	714	0.0322	14	404	0.0347	9	310	0.0290
3001 – 4000	0.51	10	467	0.0214	5	240	0.0208	5	227	0.0220
4001 – 5000	0.48	8	313	0.0256	6	149	0.0403	2	164	0.0122
5001 – 6000	0.37	6	236	0.0254	5	87	0.0575	1	149	0.0067
6001 – 7000	0.21	3	209	0.0144	2	43	0.0465	1	166	0.0060
7001 –	0.06	2	924	0.0022	2	51	0.0391	0	873	0.0000
<i>All</i>	0.56	123	5446	0.0226	76	3023	0.0251	47	2423	0.0194

Explanation:

Income is per capita GDP in 1985 PPP \$, lagged one year

$p_A$  is the proportion of authoritarian regimes in the income band

$t_{jk}$  total number of regime transitions

$n$  total number of observations

$p_{jk}$  probability of transition in either direction

$t_{AD}$  number of transitions from authoritarianism to democracy

$n_A$  number of observations of authoritarian regimes

$p_{AD}$  probability of transition from authoritarianism to democracy

$t_{DA}$  number of transitions from democracy to authoritarianism

$n_D$  number of observations of democracies

$p_{DA}$  probability of transition from democracy to authoritarianism

Table 2: Transition Probabilities as a Function of Per Capita Income (Probit Estimates).

<i>COLUMN</i>	1	2	3
		<i>p<sub>DA</sub></i>	
<i>N</i>	2423	2423	2423
<i>CONSTANT</i>	-1.31*** (0.12)	-1.2954*** (0.1730)	-1.3566*** (0.1237)
<i>GDP/cap</i>	-0.2262*** (0.0426)	-0.2357*** (0.1165)	-0.2672*** (0.0516)
<i>(GDP/cap)<sup>2</sup></i>		0.0014 (0.0153)	
<i>STRA</i>			0.2280*** (0.0755)
<i>LOGL</i>	-198.21	-198.21	-193.98
		<i>p<sub>AD</sub></i>	
<i>N</i>	3023	3023	3023
<i>CONSTANT</i>	-2.08*** (0.07)	-2.18*** (0.10)	-2.20*** (0.08)
<i>GDP/cap</i>	0.0572** (0.0233)	0.1386** (0.0630)	0.0306 (0.0256)
<i>(GDP/cap)<sup>2</sup></i>		-0.0092 (0.0073)	
<i>STRA</i>			0.3375*** (0.0506)
<i>LOGL</i>	-352.27	-351.13	-332.74

Note: All variables are lagged one year.

Table 3: Transition probabilities conditioned on past history of regimes.

Democracy fell in the past	Regime at $t - 1$	Regime Dic	at $t$ Dem	$N$
NO	Dem	0.0006	0.9994	1575
YES	Dem	0.0542	0.9448	848
ALL	Dem	0.0194	0.9806	2423
NO	Dic	0.9880	0.0120	2331
YES	Dic	0.9306	0.0694	694
ALL	Dic	0.9749	0.0251	3023

Table 4: Emerging military and civilian dictatorships as a function of past instability.

<i>STRA</i>	<i>N</i>	<i>CIVILIAN</i>	<i>MILITARY</i>	<i>p<sub>AD</sub></i>	<i>Initial income</i>
0	43	43	0	0.0120	985
1	23	7	16	0.0639	1446
2	15	0	15	0.0769	2087
3	5	0	5	0.1071	2355
4	2	1	1	0.0625	3569
5	1	0	1	0.1429	5851

Table 5: Transition Probabilities as a Function of Initial Per Capita Income and Subsequent Development (Probit Estimates).

<i>COLUMN</i>	1	2	3
<i>N</i>	3006	3006	2899
<i>CONSTANT</i>	-2.22*** (0.08)	-2.21*** (0.08)	-2.36*** (0.11)
<i>Initial GDP/cap</i>	0.2055*** (0.0387)	0.0565 (0.0380)	0.0736 (0.0562)
<i>Change GDP/cap</i>	-0.0273 (0.0387)	-0.0165 (0.0380)	0.0379 (0.0400)
<i>STRA</i>		0.3158*** (0.0599)	0.2602*** (0.0666)
<i>EMIL</i>			0.2757** (0.1141)
<i>LOGL</i>	-345.21	-332.26	-315.83

Table 6: Survival models.

	<i>Duration</i>	<i>Duration</i>	<i>Annual</i>
<i>N</i>	138	138	3054
	<i>Cox</i>	Loglog <i>istic</i> <sup><i>a</i></sup>	Loglog <i>istic</i> <sup><i>b</i></sup>
<i>Constant</i>		3.52*** (0.26)	3.52*** (0.26)
<i>GDP/cap</i>	0.0588 (0.0621)	0.0688 (0.0672)	0.1671** (0.0810)
<i>STRA</i>	-0.7813*** (0.1188)	-0.6992*** (0.1351)	-0.6992*** (0.2067)
<i>EMIL</i>	-0.6100** (0.2705)	-0.2023 (0.2883)	-0.2023 (0.3358)

Note: Signs of coefficients are inverted in Cox to make them parallel to other models. Sixty-two observations are censored. *a* With left truncation. *b* The C-statistic for the receiver operating curves (Beck et al. 2001) is 0.63.

Table 7: Equilibrium Frequencies of Democracies, by Per Capita Income

<i>Income</i>	$p_{AD}$	$p_{DA}$	$p_D^*$
-1000	0.0159	0.0822	0.16
1001 – 2000	0.0265	0.0420	0.39
2001 – 3000	0.0346	0.0284	0.55
3001 – 4000	0.0205	0.0221	0.48
4001 – 5000	0.0411	0.0121	0.77
5001 – 6000	0.0588	0.0066	0.90
6001 – 7000	0.0465	0.0060	0.89
7001 – 8000	0.0455	0.0000	1.00
8001–	0.0256	0.0000	1.00

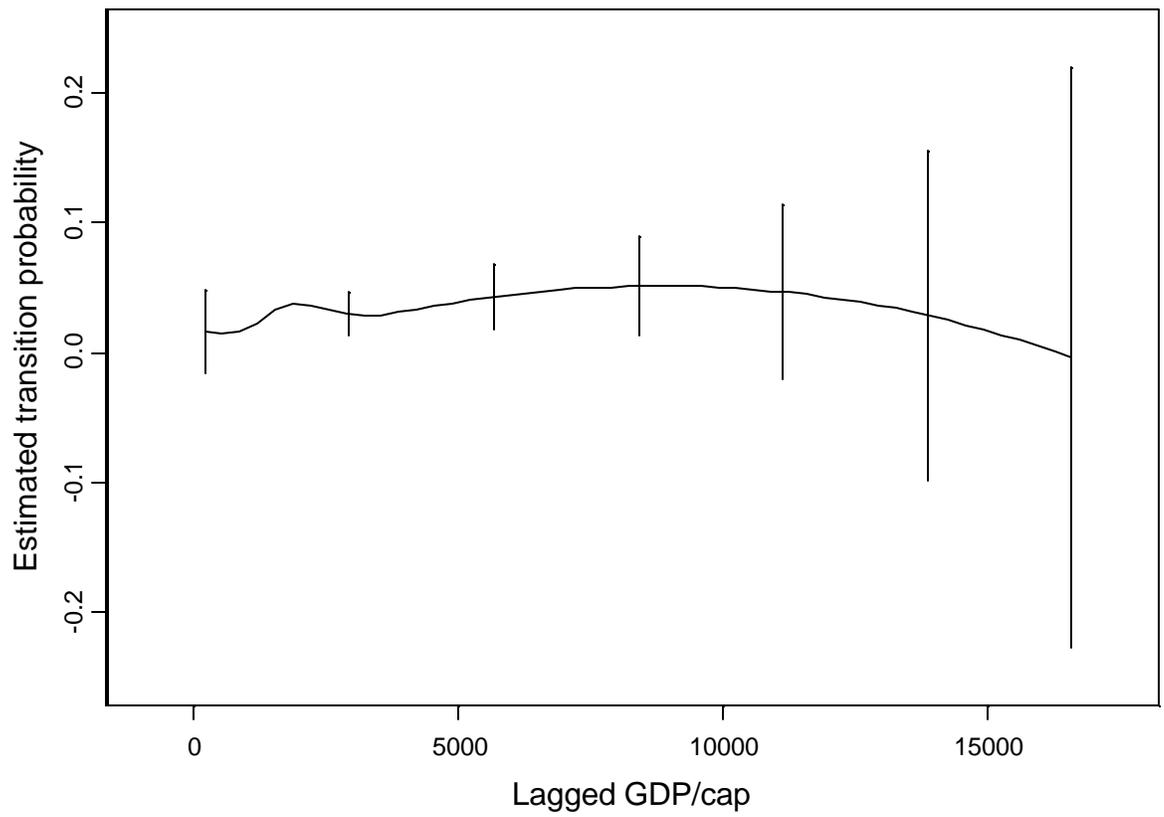


Figure 1: Transitions to democracy given per capita income: point estimates and 95% confidence intervals.

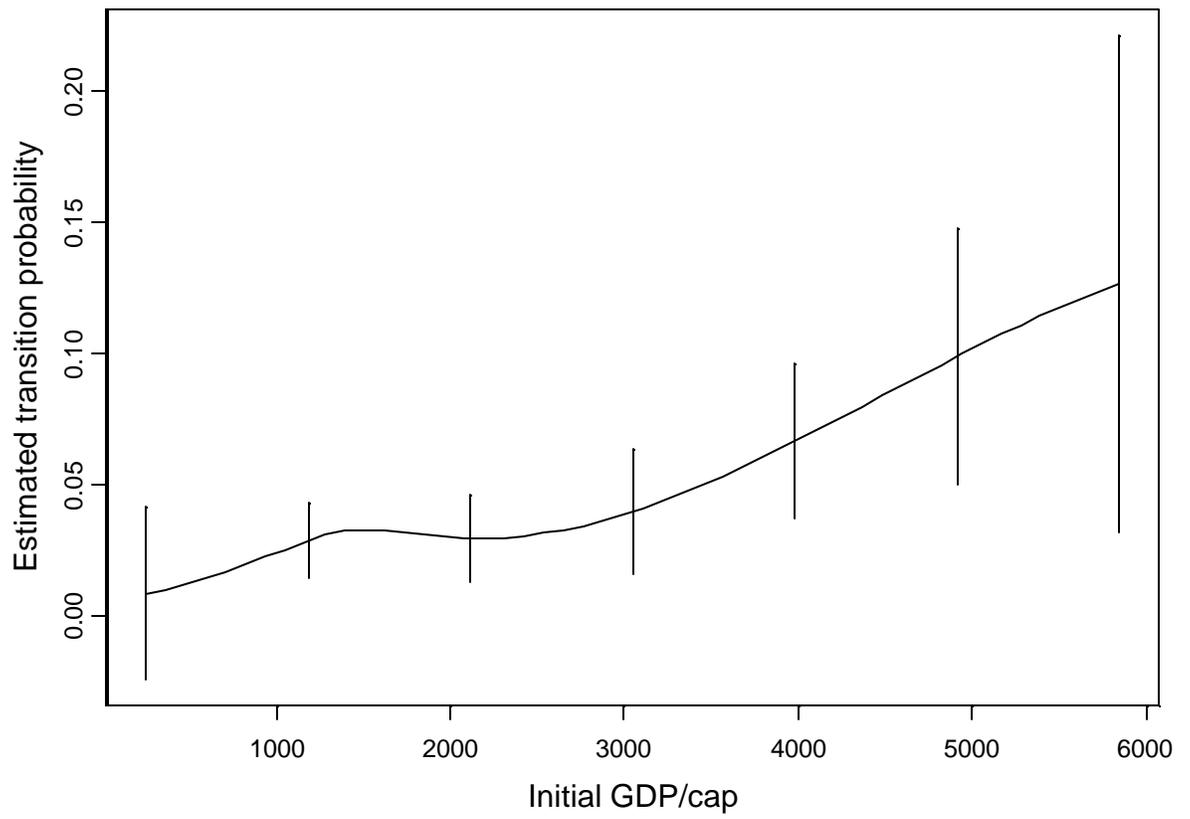


Figure 2: Dictatorships that emerge with higher incomes are more likely to die.

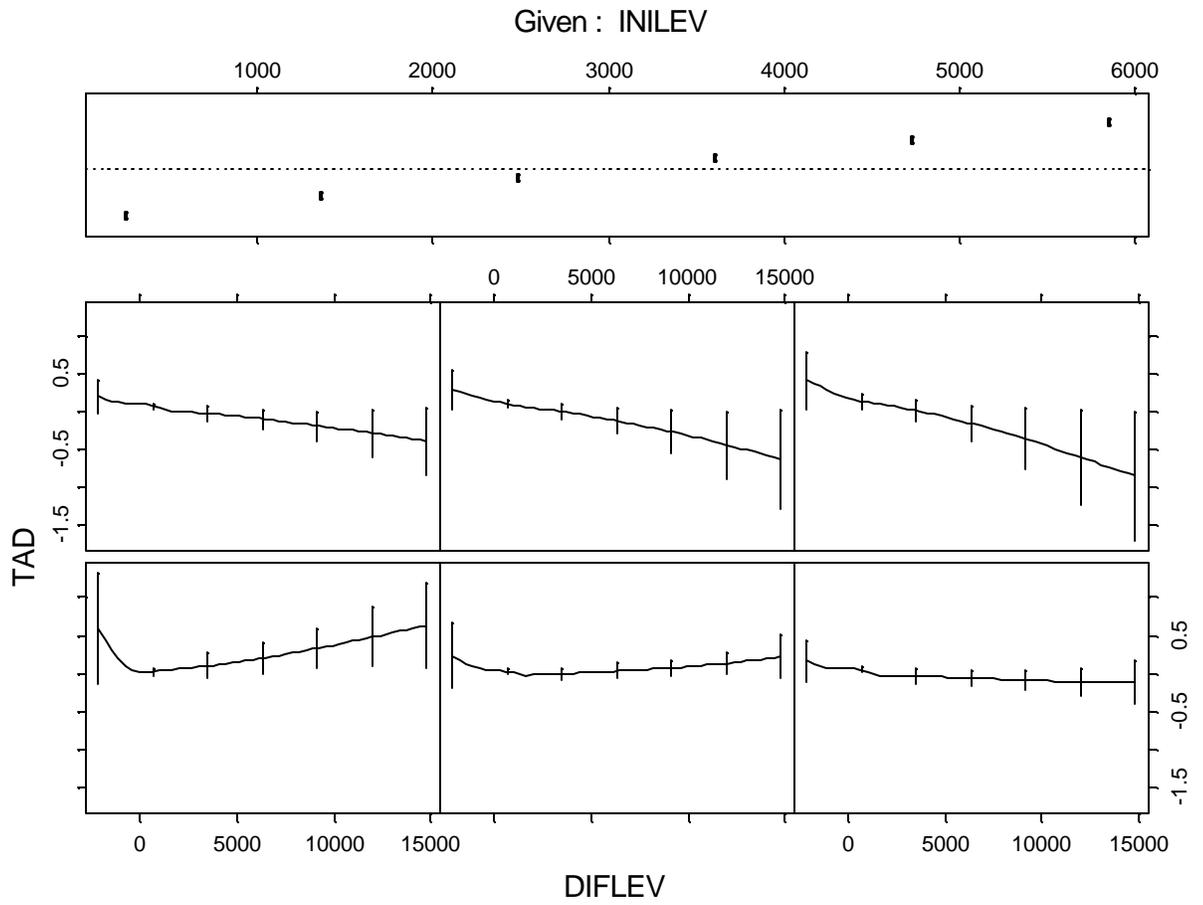


Figure 3: Given higher initial income, development makes dictatorships less likely to die.

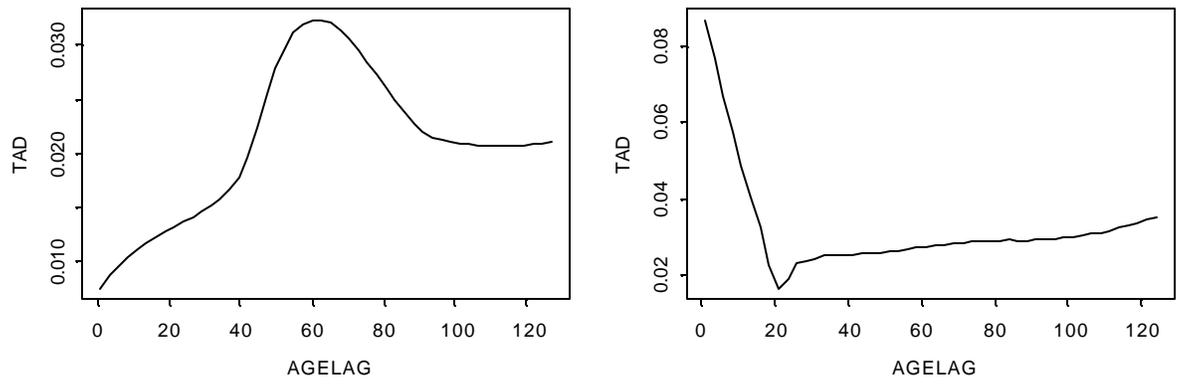


Figure 4: Transition to democracy as a function of regime age, civilian and military.

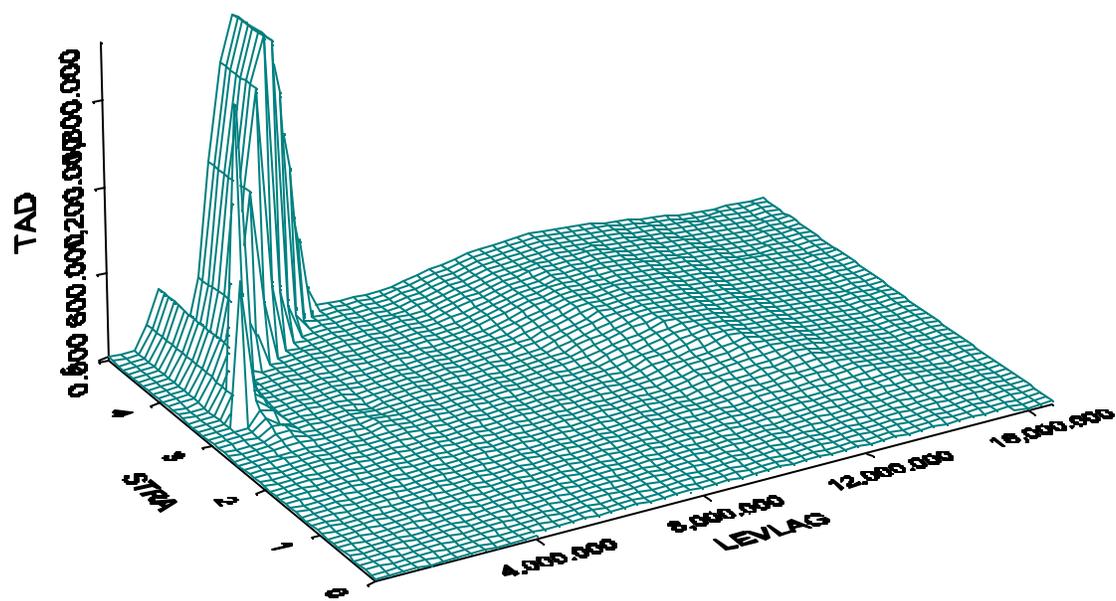


Figure 5: Transitions to democracy as a function of income and past instability