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Working Paper

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IFN Working Paper, No. 1090

Provided in Cooperation with:
Research Institute of Industrial Economics (IFN), Stockholm

Suggested Citation: Jørgensen, Christina Mangaard; Bjørnskov, Christian (2015) : Did Africa's first choices matter? Growth legacies of leaders at independence, IFN Working Paper, No. 1090, Research Institute of Industrial Economics (IFN), Stockholm

This Version is available at:
https://hdl.handle.net/10419/129649

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Did Africa's First Choices Matter? Growth Legacies of Leaders at Independence

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Abstract: We explore the potential effects of the first leaders of Sub-Saharan Africa. We first outline a set of theoretical reasons for why leaders may matter particularly at the critical juncture of African independence and why this influence may be persistent. In an unbalanced panel from 40 African countries observed since independence, we find evidence of strongly persistent effects of the education of African leaders. Only military coups seem able to break the persistent negative influence of this characteristic.

Keywords: Africa, leaders, institutions, development

JEL Codes: O11, O43, O55, P16

* We are grateful for insightful comments from Rune Jansen Hagen, Therese Nilsson, Martin Paldam, Martin Rode, Sigve Tjøtta and participants of the 2015 Danish Public Choice Workshop and a seminar at the University of Bergen. All remaining errors are entirely ours. Christian Bjørnskov gratefully acknowledges financial support from the Jan Wallander and Tom Hedelius Foundation.

1. Introduction

From the middle of the 19th century, most of Africa was colonized by Western powers and the continent remained under its European overlords until independence movements gained strength in the aftermath of WWII. The main wave of independence started in the late 1950s and in 1960 alone, 17 countries achieved independence (Seddon, 2005). With the exception of South Sudan, the full process of decolonization and independence was completed when Eritrea and Namibia became independent in the early 1990. In virtually all these countries, the key figures of their independence movements initially became the first official leaders. All promised better conditions for the people and when Africa stood on the edge of independence it was with the hope of prosperity. This positive outlook was shared by Western observers, as described by Easterly and Levine (1997, p. 1203): "In the 1960s, a leading development textbook ranked Africa's growth potential ahead of East Asia's, and the World Bank's chief economist listed seven African countries that "clearly have potential to reach or surpass" a 7 percent growth rate."

However, what should have been the start of prosperity for the continent instead became what has become known as Africa's growth tragedy (Easterly and Levine, 1997). Today, Sub-Saharan Africa is the poorest part of the world, as a consequence of 20 years of declining GDP per capita. The decline was so massive that the average 1972 GDP level was not reached again until 2004 (Paldam, 2013).[1] Discussing what went wrong, economists and political scientists have argued that large parts of this decline are due to either unfortunate geography or very bad institutions in most African countries

[1] Paldam (2013) divides the development of 44 Sub-Saharan African countries into 3 periods: 1950-1972 with decent growth, 1973-1993 with negative growth, and since 1994 where decent growth has resumed.

(Bloom and Sachs, 1998; Rodrik et al., 2004; Olson, 1996). In recent years, the focus has mostly been on institutional explanations of differences in long-run performance. Aron (2000), in a review of the early literature, finds that the quality of institutions has a robust and significant indirect relationship with growth via its effect on the volume of investment. However, more recent studies find direct relationship between institutions and growth. Acemoglu et al. (2001, 2002) for example find evidence that the quality of economic institutions explains comparative development and moreover find that private property institutions are the main determinant of economic prosperity. Berggren et al. (2012) find similar evidence but with the additional complication that institutional instability may be associated with better performance in the medium run.

A main question therefore is why some countries have persistently worse institutions and poor performance. Jones and Olken (2005, p. 839) takes the institutional discussion a step further and ask the question: "But if institutions have explanatory power, it is then perhaps a natural next step to ask whether national leaders, who may partly control or substitute for formal institutions, exert personal influence on growth." Going further with this question Jones and Olken (2005) find that leaders do matter in terms of growth. Recently, other scholars confirm the overall result that the characteristics of leaders matter for the economic development (e.g. Dreher et al., 2009; Besley et al., 2011; Jong-A-Pin and Mierau, 2013).

Institutions tend to be very persistent over time as political processes and institutions are to a large extent influenced by special interest, making it difficult to implement changes (Olson, 1982; Williamson, 2000; Sobel and Coyne, 2011). Yet, Jones and Olken (2005) suggest that leaders may matter for institutional design and more so in autocratic settings with fewer de facto constraints, which fits the context in most African at independence. We argue that African independence represents a

particularly pertinent example of a *critical juncture* – a "relatively brief period in which one direction or another is taken or an extended period of reorientation" (Collier and Collier, 1991, 27). In Collier and Collier's work on critical junctures, these are the points in time that puncture otherwise stable institutions, policy choices and development. In more recent work, Bjørnskov and Potrafke (2011) argue that a "window of opportunity" opens in the start of a transition period such as either the Central and Eastern European countries after the fall of communism or Sub-Saharan Africa at the end of the colonial period. In both situations, the critical juncture allows charismatic or particularly well-connected leaders to be able to shape institutional development in the relative power vacuum left after de jure (Britain, France etc.) or de facto (the Soviet Union) colonial masters have lost influence. Their particular characteristics are likely to affect institutional and policy choices for a long time.

We therefore ask two questions: 1) if the characteristics of the first leaders shaped subsequent long-run economic growth; and 2) given that leader characteristics did affect development, how persistent were these effects? We explore these questions in an unbalanced panel including 40 Sub-Saharan African countries observed in up to 11 five-year periods between 1956 and 2010. We find evidence of persistent legacies of leaders' ideology and education that tend to last for more than the immediate transition. However, while the political death of the first leader cancels the effects of ideology, only a coup d'etat that fundamentally changes the regime breaks the persistence of leaders' education.

The remainder of the paper is organized as follow. Section 2 introduces four examples of the potential role of the first leaders in post-independent Africa, followed by an introduction to the literature of leaders and persistence. Section 3 describes the data, model and method, while section 4 presents the result of the empirical analysis.

We discuss the main result and conclude in Section 6.

2. The African background

Africa has had many prominent leaders since independence, some with similar characteristics and policies, others differ. All in all, African countries have the same foundation but with individual stories. The section begins with four examples of leaders' role in post-independent Africa, drawing mainly on information from Colamery and Shohov (1999), Easterly, (2001), Encyclopedia Britannica (2015), Gall (2004), Lentz (1994, 1999), and Seddon (2005). We next briefly survey the literature addressing whether leaders matter and the parallel literature on economic and institutional persistence. Based on the combination of these literatures on African stories, we outline our main hypotheses to be tested in the following sections.

2.1 Four African leaders at independence

Many of the first leaders in Africa were influenced by the international ideological climate of their day, which was dominated by communist and Marxist thinking. Development studies at many Western universities, where some of the coming leaders were educated, were particularly influenced by Marxism. In addition, mainstream political discourse in the 1950s held that the Soviet Union and its satellite states were outgrowing the capitalist West (Easterly, 2007). All editions of Paul Samuelson's bestselling textbook on economics for example included, from 1948 to the early 1980s, a graph and a discussion purported to show when the living standards in the Soviet Union would surpass those of the US (Levy and Peart, 2011). As colonial rule dissolved in large parts of the world, people also had an incentive to embrace these ideological ideas while discarding the old colonial powers that were associated with capitalist

imperialism. African socialism in particular formed in the 1950s and 1960s, often combining indigenous traditions with Marxist-Leninist models of one-party rule and their promise of rapid modernization (Encyclopedia Britannica, 2015). Not only did the ideas seem to inspire key leaders, but many independence movements also received political support from the Soviet Union and other communist countries.

A leading figure in African independence movements and a pioneer of African socialism was Kwame Nkrumah, the first president of independent Ghana and active in the Pan African Movement. Nkrumah, who held an MA in philosophy from the University of Pennsylvania, was a charismatic leader who increasingly followed an autocratic line, but retained his popularity as a consequence of his Africanization policy and the new roads, new schools etc. that were being built (Birmingham, 1998). However, his administration quickly became involved in ruinous development projects, giving the country economic problems such as a growing foreign debt and an enormous balance of payments deficit. Nkrumah's response was to gradually impose a harsher political control and security, which enabled an increasingly corrupt public administration and party officials while Nkrumah buried himself in the work of educating a new generation of African political activists. Despite his cult status, his rule was over by 1966 when a successful military coup removed him from power after a period of erratic development that left Ghana about as poor as at independence (Encyclopedia Britannica, 2015).

As in many other African countries, a period of political and economic malpractice followed as Ghana went through alternating civil governments and military intervention. The result was economic decline, as depicted in Figure 1, which only ended with a military coup in December 1981, which brought Jerry Rawlings to power. While the Rawlings regime continued to violate human rights, it cleaned up the public

administration and changed Nkrumah's economic policies, after which the country entered a period of economic recovery and subsequent persistent growth. Resulting from political pressure, a new constitution was introduced in 1992, which lead to the first free presidential election in 13 years that Rawlings won (Seddon, 2005). Ghana has since been considered one of the relative success stories of Sub-Saharan Africa.

Insert Figure 1 about here

Another of the front figures of African Socialism was the teacher and first president of Tanzania, Julius Nyerere, who was a fervent believer in socialism and the architect behind one of the best known examples of disastrous economic planning in Africa. He was elected president after independence in 1964 and remained in power until 1985. Tanzania developed rapidly in the early years of his presidency, but stagnated and eventually experienced a long period of decline in the 1970s and 1980s. As in Ghana, a main reason was adventurous but ruinous policy experiments. In Tanzania, Nyerere attempted to initiate a socialist society based on cooperative agriculture, known as "Ujamaa" (family hood). The country emulated Soviet and Chinese ideas by collectivizing village farmlands and forcefully reallocating people, though the program also included an emphasis on free and universal education and literacy campaigns.

Nyerere's goal was to achieve a combination of economic cooperation, racial and tribal harmony and moral self-sacrifice. He considered this the path for Tanzania to achieve economic self-sufficiency and non-dependence on foreign aid and foreign investments, yet reality was far from the aspirations of Nyerere. The peasantry resisted the collectivization and the programme ended as an unmitigated economic disaster. By 1976, when the Ujamaa programme was abandoned, Tanzania had been transformed from the largest exporter to the largest importer of agricultural products in Africa.

Upon Nyerere's resignation in 1985, Tanzania remained one of the poorest countries in the world; agriculture was at the subsistence level, the industrial and transport infrastructures were underdeveloped and a third of the national budget was supplied by foreign aid. Although Nyerere is often credited for Tanzania's high literacy rate and relative political stability, real GDP in 1985 was lower than 600 USD per capita, a staggering 2 % of the US level (Encyclopedia Britannica; Seddon, 2005). Nyerere was succeeded by Ali Hassan, and under his presidency Tanzania started to experiment with economic liberalization. Tanzania remains one of the poorest countries in the world although growth rates have increased in recent decades.

In Côte d'Ivoire, the population experienced a similar degree of political stability and progress during the first decade after independence. Félix Houphouët-Boigny, who had been Minister Delegate of Colonial Power immediately before independence, became the first president of independent Côte d'Ivoire in 1960 and held on to that power until 1993. His rule was for many years not especially repressive and contrary to most other African leaders, the medically trained Houphouët-Boigny pursued relatively liberal free enterprise policies. However, the country was very far from democracy or any other form of comparatively transparent rule. Symptomatic for a large part of the first leaders, Houphouët-Boigny is known to have said that "There is no number two, three, or four… There is only a number one: that's me and I do not share my decisions" (as cited in Jones and Olken, 2005).

During the first half of his regime, Côte d'Ivoire welcomed foreign investments and quickly became a major exporter of agricultural crops such as cocoa and developed into a successful capitalist state with close ties to France. However, in the 1980s, declining primary product prices slowed down growth, as is evident in Figure 1. Simultaneously, in his later years Houphouët-Boigny became obsessed with developing

his hometown with plans that included the construction of a massive Catholic cathedral. It was not until 1990 that a multi-party system was established, yet Houphouët-Boigny still had enough power to win the election (Encyclopedia Britannica; Kavanagh, 1998).

Côte d'Ivoire did not succeed in maintaining a prosperous state and after the death of Houphouët-Boigny, longstanding ethnic and religious tensions increased. A subsequent government tried to rewrite the constitution to prevent certain challengers from running for president and growing student and industrial unrest, a military coup in 2000, and economic decline culminated in a civil war in 2002 (Encyclopedia Britannica; Seddon, 2005).

Botswana, our final example, remains the most noteworthy exception to the average story of African development and decline Botswana (Acemoglu et al., 2003). The popular story of the remarkable first president of Botswana, Sir Seretse Khama, begins with a love story: it received both African and international attention when Khama – who was born into the royal family and inherited a chieftainship from his father at the age of four – met the white, English Ruth Williams during his education in Britain and chose to marry her. As a consequence of the controversy created by his marriage to Williams and his general popularity, Khama was forced by the colonial authorities to renounce his chieftainship to be allowed to return to Bechuanaland (Botswana). On his return, he entered politics as a private person, helped negotiate the terms of independence and got elected as the first president of.

Khama was ideologically a conservative who sought to diversify and strengthen his country's economy. While public expenditures were large and included the introduction of free and universal educational, and the government played a role in the development of the country, Khama's government respected the de facto independence of the judiciary and painstakingly sought to balance the public budget in most years

(Acemoglu et al., 2003). Immediately after independence, most plans revolved around supporting a rural sector that mainly consisted of cattle ranching. This fell in line with the interest of the elite as almost two thirds of all members of the National Assembly in the early years were substantial cattle owners.

Later, private mining companies were encouraged to explore the country, which led to the discovery of nickel, copper and also diamonds. The diamond industry has since then been responsible for a large share of Botswana's output, and though the government negotiated terms so that they receive 50 % of the profits, it has never tried to nationalize the industry or in other ways interfere with its rights. Also contrary to the situation in most resource-rich countries, Botswana remained fully democratic, a political system that survived Khama's death in 1980 (Andersen and Aslaksen, 2013). Likewise, both the market economic system that insured a continuation of growth and prosperity in Botswana and the tradition of strongly conservative fiscal policy – once ridiculed by Zambian president Kenneth Kaunda as that of a "government of cattlemen" – have survived his absence (Kavanagh, 1998). The consequences are clear in Figure 1, which depict Botswana's transition from being one of the world's poorest countries to having a real GDP per capita similar to that of Bulgaria in the most recent years.

These four brief narratives serve as the background of our empirical exploration in the following. As stressed by Acemoglu et al. (2003), Botswana's success rests on good economic policies that stimulated rapid growth, investment and a socially efficient utilization of resource rents. Ghana and Tanzania quickly developed problems resulting from disastrous policies, despite the popularity of their first leaders while the problems of Côte d'Ivoire had their roots in the presidency of Felix Houphouët-Boigny, but only developed after his death. We argue that in all cases, the choices and background of the first leaders of these countries are important to understand their long-run development.

In the following, we therefore connect the characteristics of leaders to their choice of policies and institutions of importance to long-run growth.

2.2 Why would leaders matter?

Even though a long literature analyses the causes of the African growth tragedy, the role of individual leaders in economic growth has traditionally received little attention. However, a recent emerging literature connects personal traits of politicians with policy and institutional outcomes and their growth consequences. In the following, we briefly survey this literature as a background for the empirical section.

One of the pioneering studies is Jones and Olken (2005), which examines whether leaders matter. Their identification strategy rests on using leader transitions induced by the death of the incumbent from natural causes or an accident. Jones and Olkins find significant changes in growth patterns as a consequence of these transitions, that leaders matter more in autocratic regimes and in settings where the leader faces fewer constraints on his power. These changes arise mainly as a consequence of changes in monetary policy.

Besley et al. (2011) also acknowledge the importance of education in explaining economic performance and follow Jones and Olken (2005) by expanding their dataset to 215 from 77 leaders, who left office because of natural death or terminal illness. While they confirm that leaders matter, their main result nonetheless differs from Jones and Olken as they find that education matters: better educated leaders tend to be associated with higher subsequent growth.

Jong-a-Pin and Mierau (2013) take another route by investigating the relationship between the age of a dictator and economic growth but still with a dataset consisting of dictators leaving office due to natural deaths or terminal illness. They focus on dictators

and consider a dynamic version of the argument developed in Olson (1993) and McGuire and Olson (1996) in which all dictators are either roving or stationary bandits. Their main argument is that dictators care less about the future as they grow older and the probability of natural death increases, which turns them roving bandits in old age. Jong-a-Pin and Mierau indeed find evidence that an age-induced decrease in the time horizon of a dictator leads to less investment in productive capital and thereby less capital. In a similar vein, Horowitz et al. (2005) find that age affects the behavior of the leader by increasing the likelihood of initiating or escalating militarized disputes.

Starting from the standard contention that market liberalization is positively associated with economic growth, Dreher et al. (2009) examine whether leader characteristics can explain why some countries are more willing than others to implement liberalizing reforms. Dreher et al. focus on leaders' educational and professional background and find that leaders who were either entrepreneurs or scientists, are more likely to introduce reforms. Likewise, leaders with an economics background are more likely to preside over liberalizing reforms.

The overall conclusion from this small literature thus is that leader characteristics indeed do matter, and that the traits of the leaders can significantly affect the development of the country. In an African context, the first leaders after independence are particularly interesting since they presided over the first institutional and policy choices that would form the country. A final question to ask is therefore to which extent such choices are persistent and thus for how long and under which circumstances the first choices might persist.

2.3. When do leaders stop mattering?

A main reason to expect that the choices of the first leaders may have had persistent

consequences is that economic and judicial institutions are often considered to be sticky (Williamson, 2000). Sobel and Coyne (2011), exploring whether institutional changes tend to be permanent or whether reforms wear down, find that across seven separate measures of institutions, most formal political and economic institutions are non-stationary. This finding implies that changes in institutions can indeed be permanently conserved. However, right-based institutional measures tend to be stationary, i.e. they are subject to mean-reversal such that minor changes wash out over time. Once defined, these institutions, which also tend to contain integrated informal elements such as norms and traditions, are remarkably persistent.

In addition, Sobel and Coyne (2011) examine whether a country's many political and economic institutions are interrelated. They find evidence that the non-stationary institutions are co-integrated with the conclusion that institutions tend to move together over time. In other words, reforms aimed at one type of institution or policy are unlikely to hold unless reforms to other co-integrated institutions are implemented at the same time such that consistent changes derive from entire reform packages. As Sobel and Coyne (2011, p. 130) note, this finding is consistent with Olson's (1982) argument that large shocks create opportunities for successful permanent institutional change. Olson (1982) argued that in the context of sovereign nations, "institutional sclerosis" can prevent even small policy-making decisions and thus also institutional reforms to be implemented with success. Bjørnskov and Potrafke (2011), exploring how government ideology affected privatization after the post-communist transition in Central and Eastern Europe, also find evidence consistent with Olson's argument. They argue that the transition gave a clean break and created a unique situation – a critical juncture – in which special interests for a while had a minimum of influence on political institutions. Consequently, ideology affected policy choices within a particular window of

opportunity in the first years of the transition. The disruption of interest allows for comprehensive changes in co-integrated institutions and thereby effects that persist after the window of opportunity has closed.

Finally, Acemoglu and Robinson (2008) take a step towards investigating the coexistence of persistence and change in institutions but focus on the interaction between two groups in society: ordinary citizens and the political elite. They argue that the interest of the two groups can make them invest in de facto political power that interacts with de jure political power with the elite often having the strongest incentives to invest. The group with the political power, determined by both de facto political power and de jure political power, chooses the economic institutions. Their model illustrates which conditions in political institutions result in corresponding changes in economic outcomes, with the main result that the effect is the largest when political and economic reforms are implemented at the same time.

2.4. What to expect in an African context

Our argument for what makes post-independence Africa so interesting is the circumstance that the conditions in the above sections were all met at the same time. Independence from their former colonial overlords created windows of opportunity where former (colonial) special interests were reshuffled and the mostly new political institutions offered both a plethora of choices to make and few institutional constraints on the first leaders.

We therefore argue that transition to independence represented a fundamental critical juncture, causing a window of opportunity after independence similar to that during the early 1990s in Central Europe. Our theoretical structure is illustrated in Figure 2 below. The first leaders come to power within the window of opportunity in

which they have the opportunity and power to affect the set-up of formal institutions, shape political policies and thereby affect future economic performance. Yet, as the transition after independence proceeds, new special interests will emerge and anchor and the window of opportunity will eventually end.

Insert Figure 2 about here

We nevertheless also note that African political history has been far from uneventful. Policies may easily shift when new leaders are elected or otherwise peacefully appointed, but basic judicial and bureaucratic institutions are not easily changed. Instead, they tend to be inherited by the next leader and the effects left by the first leader will remain difficult to relegate. However, the entire political elite can sometimes be either refurbished or changed after civil wars or coups d'etat. Along with the actual death or withdrawal by the first leader, we consider such events the 'political death' of leaders as the circumstances around major political upheavals may be similar to those around independence. While we see strong reasons to expect growth legacies of the first leaders, we also note that there are good reasons to expect that coups may break persistence.

In the following, we operationalize the potential influence of the characteristics of Africa's first leaders in four groups: 1) personal ideology; 2) profession; 3) level of education; and 4) age. Table 1 summarizes the main theoretical background for focusing on these four characteristics. In the following, we outline the data and our empirical approach to testing these ideas.

Insert Table 1 about here

3. Data and empirical strategy

Since a complete dataset covering the first leaders of post-independent Africa do so far

not exist, we use existing sources to build one along similar lines as Jones and Olken (2005) and Dreher et al. (2009).[2] Our information mainly derives from the Encyclopaedia of Heads of States and Governments and the Encyclopaedia Britannica, supplemented by a large literature and several additional Encyclopaedias.[3] We first of all gather data on the ideology, profession, education level, age and tenure of the first leaders of Africa.

While ideology is difficult to measure, recent studies provide practicable guidelines as how to do so. We follow the main approach in Bjørnskov (2008) in placing leaders' ideological positions on a five-point scale: the scale -1 is given to unreformed socialist and communist positions; -0.5 to socialist and African socialist positions, often combined with a nationalistic character; 0 to pure nationalist, military or social democrat ideology; 0.5 to conservative ideology; and 1 to classical liberalist positions, although we have found no leaders within this group. In case a leader changed his ideological position during his tenure, we code his ideological position at the start of his tenure.

We secondly create a set of dummies capturing the profession of the leader before entering national politics. We start by dividing profession into eight groups: medical, social, agricultural, technical, political/administration, philosophical, lawyers and business and a residual other category.[4] Eventually, the three categories of agricultural,

[2] In some cases, very little information is available, and in any event, the details of information on each leader vary a lot. This means that we have in a limited number of cases had to use our judgement in order to classify leaders. However, all data are available for replication purposes.

[3] A large literature and several Encyclopaedias where consulted, but if information was not to be found elsewhere Wikipedia was consulted. The full list is referenced in appendix.

[4] It would have been preferable to include a dummy for whether the leader was a political activist or not. As a consequence of the challenges regarding leader information and the fact that most of the leaders

technical, and philosophical drop out as no leaders fit them. In the cases of professions not applicable in the categories or several dominating professions, they are coded to the category "other profession". It may be worth noting that the social category covers a large amount of leaders working as teachers before they go into politics. Political/administration covers the leaders who entered politics directly with no prior professional experience, and those who worked in the colonial administration.

Third, we capture their education in five categories: no education / no formal education, primary education, higher education in the home country, higher education in other African countries, and higher education in Western countries. Education is coded as the highest education completed. If it is clear that the leader did not finish an education, it is coded as the level below.

Finally, we code the age of the leader at the beginning of presidency by subtracting the birth year of the leader from the year of independence. Leaders' tenure are instead divided into short tenure and long tenure. A dummy indicates if the leader was in power for five years or less and another if the leader was in power for more than five years. While other cut-offs could be applied, we follow the five-year window of opportunity identified in Bjørnskov and Potrafke (2011).

Turning to the question of persistence, we include two measures of events that could potentially break the persistence of the choices of the first leaders. We first define a regime change as an exit of the first leader as a consequence of a coup not executed by a person in close line with the first leader.[5] Second, we define the 'political death' of the

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where political activists in the transition from colonial rule to independence it has not been possible to code a plausible dummy for this purpose.

[5] A distinction of whether a clear change has been made can be quite difficult, as in many situations the first leaders experienced a coup from someone in contact or in relation with the government. As a consequence of the relatively small size of the sample and the fact that many leaders where authoritarian

first leader is the situation in which he no longer has any discretionary influence on the political agenda in the country. This is the case when the leader exits power as a consequence of either natural death or as a consequence of a coup that drives him into exile (or strongly executed house arrest) and from which he does not return to politics later in life.

These variables form the core of our dataset. We follow much of the growth literature in organizing the dataset in five-year periods. We therefore follow a simple rule when assigning leader characteristics to each period: if a change occurs in the first three years of a period, we assign it as starting in this period while if it occurs in the last two years of the period, it is assigned to the following period. Consequently, if independence occurred in the first three years of a five-year period, a leader dummy will be one but zero if independence occurred later in the period. We apply the same coding rule to regime change and political death. Time since independence is calculated in the same manner, with the difference that the first period counted as independent is coded with 0, as this is when independence happened, and the following periods are coded as the time since independence and until the middle year of the period.

Our main dependent variable derives, as do all national accounts data, from the Penn World Tables, mark 7.1 (Heston et al., 2012). It is the average annual growth in real GDP per capita (chain indexed) within each five-year period between 1955 and 2010 for which data are available. As argued by Aron (2000), institutions do not only have a direct effect on growth but can also have an indirect effect via their effects on investments. We deal with this complication in two ways: first, we run growth

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and in that sense often isolated in power, this condition has been relaxed. Coup not leading to a regime change is only seen as when it is a person in close relation with the first leader, as for example King Mwambutsa IV of Burundi, who left his son in power before leaving the country.

regressions with and without the investment share, and second, we estimate models with the investment rate as the dependent variable.

We add a number of standard control variables while keeping the specification as parsimonious as possible: the logarithm to initial GDP per capita, openness, measured as total trade volume relative to GDP, and government final consumption from the Penn World Tables.[6] Schooling is included as a proxy for human capital and measured as the average years of total schooling for the population above 15 years (Barro and Lee, 2010). Our measure of political instability is a dummy variable indicating whether a coup or a coup attempt was made, which derives from Marshall and Marshall (2014). Finally, we add the relative price of capital goods calculated as the price level of investment relative to the price level as a measure of market distortions. All available data (except initial GDP) are averaged over 5 years in the period of 1955-2010.

Table 2 summarizes our main data. A full overview of the data, including a detailed account of the leader data, and source references is available in appendix A; Appendix B gives an overview of the countries in the sample.

Insert Table 2 about here

The full dataset is unbalanced for several reasons. First, we note that data for Libya, Somalia and Sudan are missing for the entire period and these countries therefore drop out of the sample. Egypt, Liberia and South Africa are also dropped as a necessary consequence of the fact that they became independent before the period of 1956-2010. As such, the dataset is reduced to comprising only Sub-Saharan Africa which results in a maximum sample consisting of 40 countries with 355 observations in the 11 five-year periods between 1956 and 2010.

[6] In the few cases, where early GDP data are not available in the Penn World Tables, we use data from Maddison (2003) and converted to 2005 prices.

We employ these data in the following in a series of pooled times-series cross-section (panel data) regressions. Our basic specification takes the following form:

$$growth_{it} = \beta_0 + \beta\ leader\ characteristics_{it} + \gamma\ X_{it} + \ \eta_i + \varepsilon_{it} \qquad (1)$$

where the dependent variable $growth_{it}$ the annual growth rate of GDP per capita in country *i* at time *t*, leader $characteristics_{it}$ is the vector of characteristics of the first leader in country *i* at time *t*; *X* is the vector of control variables, including log to initial GDP, openness, schooling, government share of GDP, instability and equations with and without investment share of GDP per capita; η_i are period fixed effects and ε_{it} is the error term. When we use investment shares as the dependent variable, we employ a similar specification, but with an *X*-vector that includes the log to initial GDP, openness, schooling, government share of GDP, instability and market distortion; η_i are again period fixed effects and ε_{it} is the error term.

In addition, we estimate a set of extended models that include interaction terms between leader characteristics and a *Z*-vector capturing the log to the time since independence to assess 'soft' persistence that does not necessarily extend to the full period and regime change and political death that could directly break persistence.

While country fixed effects are widely used in panel data model, and thus in the literature on leaders' effects, this choice is not practicable in our context, as it eliminates all time-invariant explanatory variables. Consequently, with country fixed effects it would be impossible to estimate growth legacies of the first leaders. Instead, we estimate the model with a feasible generalized least squares (FGLS) random effects estimation as FGLS accounts for the time-invariant variables and allows for estimation in the presence of autocorrelation within panels and cross-sectional heteroskedasticity across panels.

Likewise, while we do not have an endogeneity problem – subsequent growth

cannot have affected the choice of the first leaders of Africa – we recognize that their characteristics may have reflected relevant differences across the continent. For example, if a population elected a poorly educated politican as its first leader, the choice may simply reflect that the population itself was poorly educated. Similarly, if the first leader selected by a political elite was heading a communist or African socialist government, it may be a consequence of having had particularly dirigiste colonial institutions (cf. Olsson, 2009). Finding that the socialist first government subsequently is associated with poor economic outcomes may therefore be a cause of factors already in place before independence, and not of the first choices after independence. If this is so, we are facing a reflection problem that problematizes any causal inference (cf. Manski, 1993). While we cannot directly alleviate this problem, we instead show in an appendix that the selection of particular characteristics of the first leaders appears approximately exogenous when focusing on the most obvious pre-independence factors.

Furthermore, as stressed by Brambor et al. (2006, 73), interactions need to be interpreted symmetrically, as interaction terms make the effect of the explanatory variable X on the dependent variable Y depend on the third conditioning variable Z. Consequently the standard error of interest is the standard error of the conditional marginal effects and not the reported standard error of the interaction term. We calculate the conditional marginal effects and the corresponding standard errors by the delta method.

Finally, we perform two simple robustness tests throughout. First, we test our results by excluding countries that experienced civil war in the period 1956-2010, as the instability and unrest caused by civil war can intervene with our main results. Second, Botswana is a particular success story that stands out by experiencing high growth throughout the entire period since independence and is in some ways structurally

different from the rest of Sub-Saharan Africa (Dollar and Easterly, 1999; Devarajan et al., 2001). The robustness of the results is therefore tested by excluding Botswana from the sample.

4. Results

4.1. The preliminary picture

A preliminary look at the raw data yields a first impression of whether the first leaders affected the long-run growth of their respective countries. We divide the countries in the sample into different categories according to the leaders' characteristics. Throughout the section, the average growth in GDP per capita is calculated per year for the first five and first ten years after independence for the 40 countries in the final sample. Figure 3 shows the average growth of country clusters separated by the ideology of the first leaders.

Insert Figure 3 about here

At first impression, the figure indicates that leaders' ideology may have mattered. The average conservative country experienced an average annual growth of 5.77 percent during the first five after independence.[7] For the first ten years after independence, growth was on average only a bit lower at 5.14 percent while the average communist country experienced growth rates of 1.08 and .46 percent, respectively.

Figure 4 instead shows a clear deviation in average growth per year depending on the previous profession of the leader. The social profession, which comprises 12 out of the 40 leaders in the dataset, stands out with a low average growth at 0.30 percent in the first five years after independence and 0.38 percent in the first ten years. Conversely,

[7] Controlling for the great success of Botswana, the numbers are still high with respectively 4.50 % and 4.33 % the first 5 and 10 years.

countries with a leader that had a background as a lawyer or business leader experienced much higher growth: 6.97 percent and 4.42 percent, respectively. Yet, this difference is driven by Botswana, as it drops to .91 percent and 2.22 percent, respectively, when the country is left out.

Insert Figure 4 about here

In Figure 5, we present the raw differences according to leaders' education. These differences are relatively large, as the average country with a leader with only primary education experienced low growth at .60 and .86 percent in the first five and ten years after independence. The average country with a leader with a high education in the home country instead experienced a high growth of 3.77 percent in the first five years, which nonetheless drops to 1.61 percent when we focus on the first decade. This apparent advantage therefore seems to have been entirely temporary. Yet, countries with leaders with a leader with a high western education experienced growth rates of 3.59 percent and 2.94 percent, respectively. Excluding Botswana from the data reduces these averages to respectively 2.96 percent and 2.31 percent.

Insert Figure 5 about here

While distinguishing between the age of the leader or his tenure duration yields no clear differences (which is why we do not show them), the simple differences do suggest that the characteristics of the first leaders may have had consequences. However, if these differences are spurious and if not, how persistent they are, requires more formal analysis.

4.2. Main findings

Turning to the main findings, we report the results of estimating the baseline models without leader characteristics in columns 1 to 4 of Table 3a. In column 1, which reports

the full baseline model and therefore the effects of the unrestricted model, we first note that schooling and government consumption fail to attain significance (cf. Pritchett, 2001). Since the inclusion of schooling reduces the sample from 355 to 266 observations, we remove both variables from the specification in the remaining columns to prevent issues of sample selection.

Insert Table 3a about here

Insert Table 3b about here

When excluding the variables schooling and government share of GDP in the base model in column 2, initial GDP per capita becomes significant at the 5 % level with a negative sign and remains significant at the 10 % level or better in all subsequent growth models. Openness likewise is always highly significant in both growth and investment models, as in column 3. Our measure of political instability also exerts a significant and negative effect on growth and the inclusion of investments appears not to affect its size or significance.

As noted above the investment share of GDP is included in column 3 to control for the possibility that the effects are mediated by this factor. This seems partly the case for openness, which is confirmed by results in column 4 where openness remains significant. In addition, our measure of price distortions in the capital goods market proves to be of economic and statistical significance for investments throughout the table while initial GDP and political instability never attain significance in investment models.

We next include our measures of leader characteristics in final columns of Table 3a and in the corresponding Table 3b. First, we find no significant effects of leader ideology on growth in the standard model. Likewise, in columns 1-3 in Table 3b, we observe no clear effects of leaders' professions on either growth or investments. Yet,

when focusing on leaders' education, we find consistently negative estimates of which the 'high African' category is strongly significant with a rather large size in the growth models in columns 4 and 5. Finally, we find some indication of negative effects of having relatively old leaders at independence. However, this variable only becomes significant when controlling for the investment rate but it appears unrelated directly to investments. We therefore must interpret this seeming result with some care.

4.3. Persistence results

Overall, the present estimates in Tables 3a and 3b imply rather strict assumptions for strong persistence, as the basic models test for persistence so strong that it will show up in a full period of 55 years. The results above imply that only the characteristic of a high African education has an effect that persist so long that it is visible in the standard model. None of the leaders have been in power for anywhere close to 55 years and the question therefore remains if the identified effects are conditional on time. As a preliminary for the following tables, we go on to test this possibility by including an interaction between the characteristics of the leaders and time since independence in Appendix Tables A3a-d.

At a first look at the marginal effects suggest that the effects of the leader characteristics associated with ideology are conditional on time since parts of all characteristics are significant to some extent. The results indicate strong negative effects of both communism and nationalist / military leaders during the first decade or so. We we find similar negative effects of leaders from social professions, and apparently very strong effects of leaders with a background in law or business. Yet, as we show further below, since Seretse Khama in Botswana belongs to the latter group, one must regard this particular result with some care. Conversely, when we test the effects og education

characteristics, we find negative effects of leaders with little education in the first decades after independence but persistent negative effects associated with leaders with high African education. These effects mainly occur for growth but are not driven by investment effects. Finally, the potential effects of age seem to occur much later after independence than other effects while we see no clearly significant effects of tenure. If robust, this particular finding is fundamentally different than other leader characteristics that tend to be clearly associated with growth from independence.

4.4. Regime change and political death

Our results so far suggest that most effects do not persist for more than a decade or so, with the possible exception of education characteristics. However, they do not inform us about the causes for the declining effects over time and while the decline might be indicative of waning influence of the first decisions, it is also consistent with a situation in which the first regimes were thrown out of office in either a coup or through the political death or demise of the first leader. In the following, we test for this alternative reading of the results in Tables 4a-d.

The main theoretical idea behind testing for clean breaks with persistence is that when a clear regime change occurs in the form a coup d'etat, it often implies a clean break with established vested interest and therefore also a potential break with effects created by the first leaders. In the present sample, 16 countries experienced a regime change due to successful coups against the first leaders. We again report the full estimates of the extended model conditional on regime change in the appendix while we report the conditional marginal effects of the leader characteristics on growth conditional on regime change in Tables 4a-d.

First, the results in Table 4a suggest that growth increases when communist

leaders are removed from power, either through a coup d'etat or otherwise. In both cases, growth is significantly higher than before the regime event. Similarly, we find weak evidence suggesting that the same occurs when we instead use the 'political death' category, that also includes nationalist or military first leaders peacefully leaving office, although we must note that this difference is not robust to excluding potential outlier observations.

These simple findings suggest that ideological growth legacies can relatively easily be broken. Yet, it also suggests that the positive effect from removing a leader with a communist ideology more likely comes from the removal of particularly bad policies than the introduction of good economic policies or institutions. Similarly, we find mixed effects when looking at the professions of the first leaders. Yet, while it seems as if leaders with a political or administrative background were associated with more growth before and less after a coup, we find the confusing opposite result when focusing on political death. The results thus suggest that peacefully dismissing leaders from social professions (which is included in the 'political death' category in addition to coups), such as Tanzania's Julius Nyerere, has been associated with significantly faster growth. The only clearly consistent result pertains to the effects of leaders with a background in law or business, yet since this is the particular background of the immensely successful first leader of Botswana, one must remain sceptical.

Insert Table 4a here

Insert Table 4b here

Turning next to the potentially persistent effects of education in Table 4c, we first find evidence in Table 5c of strong negative effects of having an African education, as in Tables 3b. Furthermore, this effect seems clearly persistent across the political death of the first leaders while the estimate of African education after a coup remains large

but just lacks significance. Finally, we find somewhat confusing differences when considering the potential effects of age and tenure of the first leaders. While it seems as if their tenure matters *after* a coup, i.e. that coups against longer serving leaders tend to result in higher growth rates, the political death of more tenured first leaders tend to result in lower growth rates. While this may indicate the influence of strong selection effects on tenure, we note that the seeming effect of political death is not robust to removing obvious outliers. Conversely, the positive effect of removing a tenured first leader remains robust to outliers, indicating a one percentage point increase in growth from successful coups against tenured leaders (cf. Jong-a-Pin and Yu, 2010).

Insert Table 4c here

Insert Table 4d here

4.5. Further robustness tests

While we have already referred to robustness tests in which we removed outliers, we in addition take account of the potentially substantial influence of massive instability induced by civil wars. We therefore use data from Marshall (2013) on the occurrence of civil wars, which allows us to estimate our models with no registered civil war in the period 1956-2010. Dropping countries experiencing civil war during the period results in a sample of 256 observations and 29 countries; we report the results in the appendix.

We find no clear change in the significance level and magnitude of main estimates with the exception that government consumption becomes significant. As such, reducing the sample to countries without civil war merely reinforces our estimates of effects of leader characteristics. Most importantly, the variables with a significant effect in the original sample do not change when controlling for substantial political instability.

Further, several studies note that Botswana stands out with an exceptionally high growth rate and seems different from the rest of Africa (Devarajan et al., 2001). To ensure that our findings are not fundamentally altered by observations from this particular country, the basic and extended model is estimated with Botswana dropped from the sample; we report the results in the appendix. On one hand, while the basic model remains unchanged, we find that the effects of the lawyer / business profession category lose significance. On the other hand, the exclusion of Botswana results in stronger effect from age and tenure while the remaining conditional findings are unchanged. In particular, the clear effects of the educational characteristics of Africa's first leaders remain strongly significant. With this observation, we proceed to discussing the results and concluding.

5. Discussion and conclusions

At the beginning of African independence in the late 1950s and early 1960s, most politicians and development economists had high hopes for the continent. The great expectations nevertheless rapidly turned to disappointment, as several African countries went through deep economic crises, civil wars and frequent coups. The continent as a whole would experience two decades of negative growth, which was to be known as the African growth tragedy.

The economic growth literature has connected this tragedy with many factors such as ethnic diversity, geographical disadvantages and the natural resource curse. In recent years, much of the literature has successfully focused on the consequences of poor institutions and education. Yet this literature begs the question of why some countries persistently have bad institutions and poorly educated populations.

One of the possible explanations is that political leaders may have an effect on

economic development, possibly through their influence on institutions and economic policies. In particular, since institutions tend to be very persistent but virtually all African countries started with a relatively clean political slate at independence, one might expect that Africa's first leaders may have been responsible by playing a central role in the set-up of the institutions of their countries at independence. In other words, we treat African independence as a critical juncture that allowed leaders to define institutions and educational policy.

We explore these questions in an unbalanced panel of 40 Sub-Saharan African countries in 11 five-year periods between 1956 and 2010. While we find indications that some types of professions, in particular leaders from social professions (mostly teachers), and communist regimes were associated with particularly bad economic outcomes for the first decade after independence, our main finding is that countries with a first leader with African education experienced low economic growth that persisted *after* the leader existed politics.

We find that only a successful coup d'etat is able to break the otherwise persistent negative influence of the first leaders with an African high school education. This effect is not due to investment activity, and must therefore logically run through productivity instead. Although we cannot reach unambiguous conclusions in what must essentially remain a preliminary inquiry into the potential effects of Africa's first leaders, the findings seem consistent with an influence through basic national institutions.

We eventually end with a series of additional questions arising out of our findings. While we must relegate these questions to future research, they include if the persistent effects are due to constitutional choices around independence, the extent to which the first leaders defined particular political traditions, or if the problems were simply a consequence of specific rent-seeking structures that some leaders allowed to persist. In

all cases, the choices made by the first leaders at the critical juncture of African independence are unlikely to have been without long-run consequences.

Appendix A

A1 – full results selection

Insert Table A1 about here

In Table A2, we estimate the probability of getting a first leader in any of the relevant categories of ideology (upper panel), education (second panel), profession (third panel), and of their age at independence (bottom panel). We estimate the first three regressions with multiple logit, as the categories are dichotomous and non-consecutive while the fourth is estimated by simple OLS. In all cases, we include the logarithm to initial real GDP per capita (from the Madison database), whether or not the country was democratic at birth (from the update of Cheibub et al., 2010), a dummy capturing whether the population had full democratic rights during colonial times, and dummies capturing if the country was a British or French colony.

Insert Table A2 about here

We first note that the regressions are quite poorly identified. We find weak evidence that initially poorer countries without a democratic tradition were slightly more likely to elect an African socialist, that countries that had democratic elections at independence tended not to elect leaders with African high school education, and richer countries were somewhat less likely to elect leaders with domestic high school education. The only strong evidence we find is that African countries with some democratic tradition were more likely to elect doctors and leaders from social or political professions – i.e. less likely to elect leaders with either experience from private

business or law or any residual categories – and that British colonies clearly tended to choose substantially older leaders.

However, we note that the only characteristic that turns out robustly significant in the analyses in the main text – having an African high school education – is only identified by a factor that is not likely to be associated with long-run growth. In particular, when exploring the countries that elected such leaders, we note that none of them remained democratic for long after becoming independent. We therefore note that the choice of first leaders with an African high school education is unlikely to be associated with growth-relevant factors that might be determined simultaneously with the leader choice.

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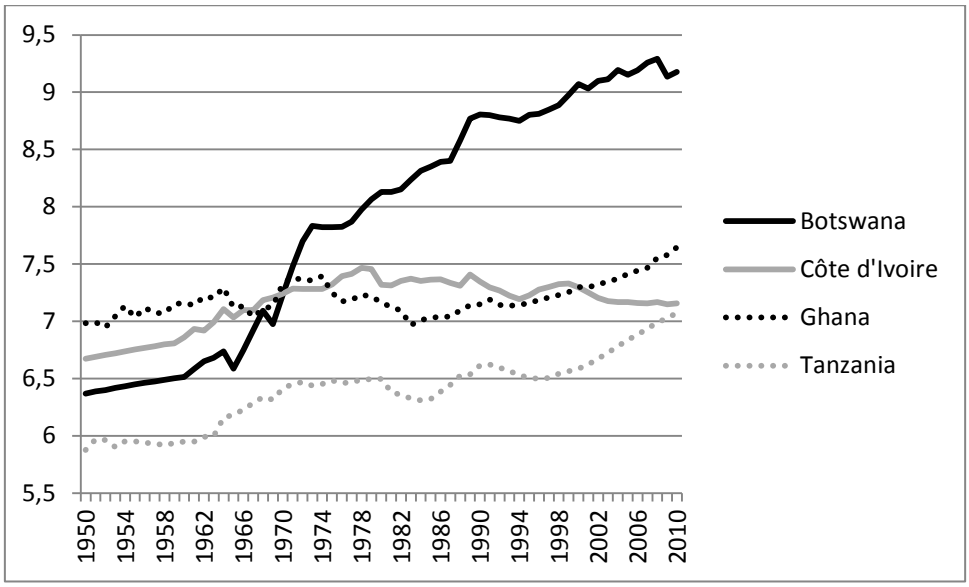
Figure 1. Real GDP per capita, four countries 1955-2010



Note: combined data from Madison (2008) and Heston et al. (2012)

Figure 2: The decision structure at independence

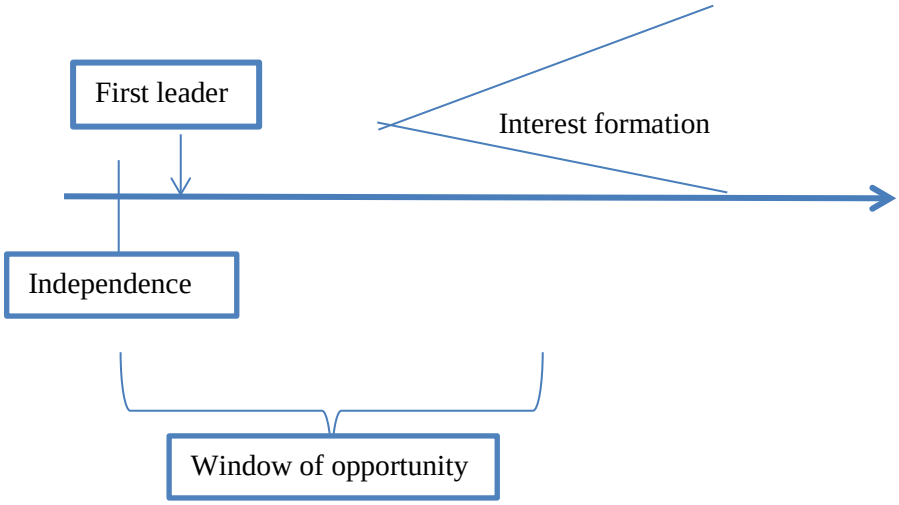


Figure 3: Average growth per country divided by ideology

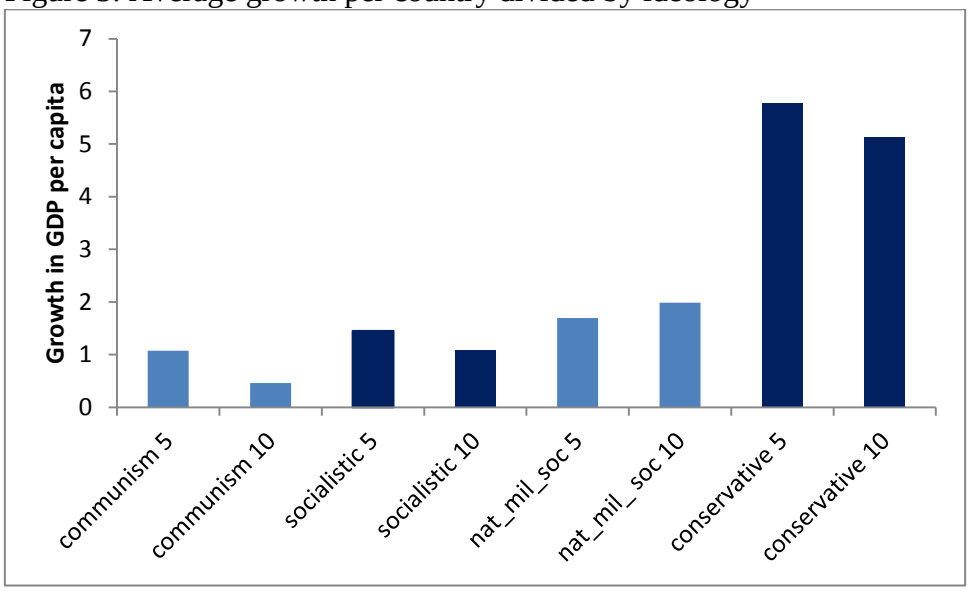


Figure 4: Average growth per country divided by profession

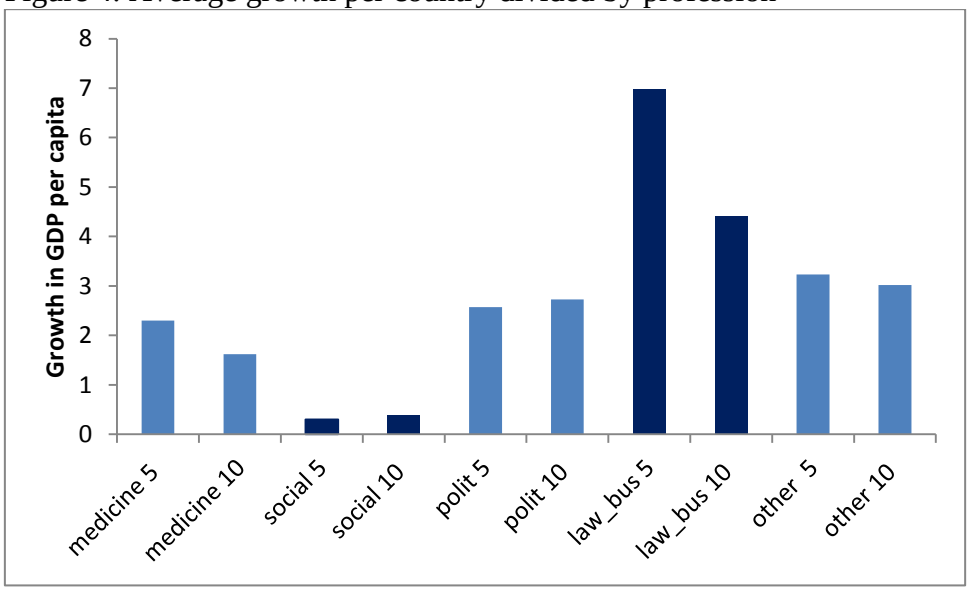


Figure 5: Average growth per country divided by education

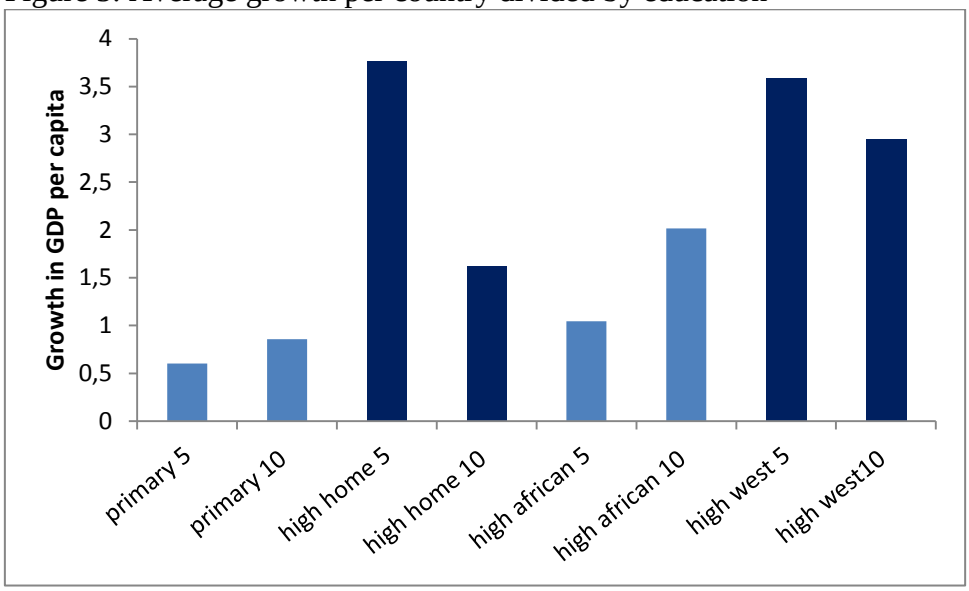


Table 1. Leader characteristics

Characteristic	Background	Main source
Ideology	Socialist and Marxist ideas were prevalent at independence. As these systems exhibit poor property rights institutions, personal ideology may be central to subsequent growth	Acemoglu et al. (2001), Bjørnskov (2008)
Profession	Reforms and market liberalizing policies are more likely with leaders from specific professions	Dreher et al. (2009)
Education	Leaders' education attainment may affect their preferences for specific institutions of education crucial to long-run growth.	Besley et al. (2011)
Age / tenure	Leaders with stable power and long time horizons have the strongest incentives to invest in growth-enhancing institutions. These conditions tend not to hold for old leaders.	Olson (1992), Jong-A-Pin and Mierau (2013)

Table 2. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Observations
GDP per capita growth	1.09	4.00	-10.75	40.62	426
Investment share of GDP	20.58	13.28	2.61	67.98	427
Initial GDP	1361.90	1760.81	308.38	11175.36	462
Openness	66.73	36.45	7.93	226.34	427
Schooling	3.24	2.05	0.19	9.56	319
Government share of GDP	13.98	11.29	0.78	64.56	427
Market distortion	1.25	0.83	0.18	5.50	427
Instability	0.32	0.47	0.00	1.00	367
Ideology					
Communism	0.20	0.40	0.00	1.00	473
Socialistic	0.12	0.33	0.00	1.00	473
Nat_mil_soc	0.31	0.46	0.00	1.00	473
Conservative	0.19	0.39	0.00	1.00	473
Profession					
Medicine	0.09	0.28	0.00	1.00	473
Social	0.24	0.43	0.00	1.00	473
Politic/Adm.	0.16	0.37	0.00	1.00	473
Lawyer/Business	0.07	0.26	0.00	1.00	473
Other	0.21	0.41	0.00	1.00	473
Education					
Primary	0.21	0.41	0.00	1.00	473
High home	0.09	0.28	0.00	1.00	473
High african	0.18	0.38	0.00	1.00	473
High western	0.33	0.47	0.00	1.00	473
Characteristics					
Age beginning	39.12	20.50	0.00	70.00	473
Short tenure	0.17	0.38	0.00	1.00	473
Long tenure	0.65	0.48	0.00	1.00	473
Time since independence	19.14	15.73	0.00	63.00	473
Regimechange	0.36	0.48	0.00	1.00	473
Political death	0.29	0.45	0.00	1.00	473

Table 3a. Basic model and ideological characteristics

Dependent	1	2	3	4	5	6	7
Variable	growth	growth	growth	invest	growth	growth	invest
Log initial GDP	-0.294	-0.985**	-1.124***	-0.050	-0.930*	-1.053**	0.105
	(0.505)	(0.445)	(0.414)	(1.868)	(0.498)	(0.461)	(2.054)
Openness	0.023***	0.052***	0.028***	0.168***	0.053***	0.028***	0.168***
	(0.008)	(0.007)	(0.008)	(0.020)	(0.008)	(0.008)	(0.020)
Schooling	-0.102						
	(0.181)						
Government share of GDP	-0.019						
	(0.039)						
Market				-7.233***			-7.257***
Distortion				(0.779)			(0.782)
Investment			0.115***			0.117***	
share of GDP			(0.019)			(0.019)	
Instability	-1.004**	-1.481***	-1.283***	-1.002	-1.465***	-1.313***	-0.934
	(0.453)	(0.436)	(0.415)	(0.905)	(0.443)	(0.421)	(0.908)
Ideology							
Communism					0.456	0.357	0.006
					(0.751)	(0.696)	(2.717)
Socialistic					-0.134	-0.016	-3.052
					(0.932)	(0.862)	(3.850)
Nat_mil_soc					0.073	0.438	-3.809
					(0.699)	(0.648)	(2.859)
Observations	266	355	355	356	355	355	356
Countries	29	40	40	40	40	40	40
Wald chi2	74.52***	123.91***	176.16***	a	122.71***	174.88***	a
R-sq within	0.2022	0.2415	0.3315	0.3331	0.2406	0.3309	0.3333
R-sq between	0.1450	0.2839	0.3644	0.6193	0.2987	0.3698	0.6437
LM chibar2	5.72***	6.86***	7.10***	228.63***	6.07***	6.40***	204.83***

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term and period dummies. The dependent variables are 5-year average GDP growth per capita (growth) and 5-year avarage investment share of GDP (invest). a: Wald chi2 reported as missing.

Table 3b. Basic model including leader characteristics

Dependent	1	2	3	4	5	6	7	8	9
variable	growth	growth	invest	growth	growth	Invest	growth	growth	invest
Log initial GDP	-1.048**	-1.224***	-0.259	-1.063**	-1.168***	0.045	-0.999**	-1.127***	-0.174
	(0.484)	(0.450)	(1.898)	(0.418)	(0.385)	(1.920)	(0.446)	(0.416)	(1.866)
Openness	0.053***	0.030***	0.163***	0.054***	0.030***	0.169***	0.054***	0.030***	0.170***
	(0.008)	(0.008)	(0.020)	(0.007)	(0.008)	(0.020)	(0.007)	(0.008)	(0.020)
Schooling									
Government share of GDP									
Market distortion			-7.177***			-7.257***			-7.280***
			(0.781)			(0.784)			(0.784)
Investment share		0.122***			0.109***			0.116***	
of GDP		(0.020)			(0.018)			(0.019)	
Instability	-1.467***	-1.238***	-1.082	-1.438***	-1.248***	-0.953	-1.420***	-1.221***	-0.976
	(0.442)	(0.420)	(0.908)	(0.432)	(0.412)	(0.907)	(0.438)	(0.417)	(0.911)
Profession									
Medicine	0.040	0.493	-3.065						
	(0.897)	(0.835)	(3.571)						
Social	0.128	0.572	-2.836						
	(0.671)	(0.627)	(2.397)						
Politic/Adm.	0.443	0.549	0.596						
	(0.827)	(0.766)	(3.341)						
Lawyer/Business	0.426	-0.358	4.503						
	(1.072)	(1.000)	(4.348)						

Education									
High home				-0.935	-1.176	3.519			
				(0.826)	(0.762)	(3.795)			
High african				-1.997***	-1.804***	-1.514			
				(0.652)	(0.601)	(2.810)			
High western				-0.478	-0.572	-0.315			
				(0.577)	(0.532)	(2.593)			
Characteristics									
Log age beginning							-0.845	-0.979**	-0.586
							(0.525)	(0.497)	(1.286)
Long tenure							0.884	0.866	1.844
							(0.616)	(0.573)	(2.686)
Observations	355	355	356	355	355	356	355	355	356
Countries	40	40	40	40	40	40	40	40	40
Wald chi2	121.43***	a	a	a	a	563.01***	129.06***	183.54***	587.85***
R-sq within	0.2416	0.3323	0.3323	0.2455	0.3336	0.3334	0.2470	0.3379	0.3331
R-sq between	0.2993	0.3822	0.6483	0.4012	0.4639	0.6413	0.3113	0.3933	0.6300
LM chibar2	6.62***	7.39***	217.35***	2.32*	2.90**	220.78***	5.10**	4.97**	213.67***

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term and period dummies. The dependent variables are 5-year average GDP growth per capita (growth) and 5-year avarage investment share of GDP (invest). a: Wald chi2 reported as missing.

Table 4a. Marginal effects, ideology conditional on regime change and political death

	Growth				Growth		
Coup	Com	Soc	Nat / mil	Pol. death	Com	Soc	Nat / mil
0	-0.418	-0.418	-0.054	0	-0.774	-0.751	-1.474
	(0.871)	(1.023)	(0.824)		(1.003)	(1.248)	(0.961)
1	**2.505***	0.824	0.190	1	**1.857***	0.110	**1.752***
	(1.311)	(2.081)	(0.710)		(1.039)	(1.243)	(0.931)

Notes: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table 4b. Marginal effects, profession conditional on regime change and political death

	Growth					Growth			
Coup	med	social	pol/adm	law/bus	Pol. death	med	social	pol/adm	law/bus
0	-0.079	-0.517	**1.502****	**2.508****	0	-0.789	-0.941	-0.825	**4.487****
	(0.750)	(0.643)	(0.711)	(1.265)		(1.028)	(0.742)	(0.925)	(1.978)
1	0.402	0.960	**-4.674*****	-0.855	1	1.159	**1.916****	**2.422****	0.044
	(2.206)	(0.810)	(1.382)	(1.089)		(1.243)	(0.919)	(1.109)	(1.072)

Notes: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table 4c. Marginal effects, education conditional on regime change and political death

	Growth				Growth		
Coup	Home	African	West	Pol. death	Home	African	West
0	**-1.558***	**-2.289*****	-0.585	0	-0.703	**-2.015****	-0.232
	(0.943)	(0.855)	(0.684)		(0.944)	(0.848)	(0.788)
1	1.381	-1.569	-0.183	1	-0.494	**-1.809****	-0.713
	(0.943)	(1.056)	(1.053)		(1.868)	(0.913)	(0.774)

Notes: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table 4d. Marginal effects, age and tenure conditional on regime change and political death

	Growth			Growth	
Coup	age	tenure	Pol. death	age	tenure
0	-0.561	-0.562	0	**-1.068***	**2.096****
	(0.544)	(0.831)		(0.576)	(1.065)
1	-0.939	**2.611*****	1	-2.428	0.512
	(2.784)	(0.978)		(1.908)	(0.794)

Notes: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table A1. Results conditional on time since independence

Dependent	1	2	3	4	5	6	7	8
Variable	growth	invest	growth	invest	growth	invest	growth	invest
Log initial GDP	-0.850*	0.288	-1.052**	-0.553	-1.081***	-0.200	-1.058**	-0.271
	(0.507)	(2.091)	(0.436)	(1.746)	(0.388)	(1.805)	(0.459)	(1.951)
Openness	0.054***	0.164***	0.052***	0.168***	0.054***	0.169***	0.056***	0.173***
	(0.008)	(0.020)	(0.008)	(0.020)	(0.007)	(0.020)	(0.008)	(0.020)
Market distortion		-7.287***		-7.314***		-7.260***		-7.401***
		(0.802)		(0.810)		(0.768)		(0.791)
Instability	-1.501***	-1.026	-1.406***	-1.080	-1.489***	-0.916	-1.637***	-1.044
	(0.435)	(0.906)	(0.435)	(0.916)	(0.430)	(0.884)	(0.448)	(0.915)
Log time since indep.	-1.487**	-2.350	-0.327	-1.619	0.188	-1.462	2.057	3.902
	(0.589)	(1.418)	(0.542)	(1.472)	(0.516)	(1.366)	(1.815)	(6.446)
Ideology								
Communism	-7.976***	0.899						
	(2.080)	(4.507)						
Socialistic	-3.894	-6.460						
	(2.409)	(5.835)						
Nat_mil_soc	-5.533***	-10.619**						
	(1.810)	(4.297)						
Profession								
Medicine			-3.443	-8.053				
			(2.740)	(5.418)				
Social			-4.820***	1.118				
			(1.855)	(4.203)				
Politic/Adm.			-1.240	0.955				

			(2.529)	(5.903)				
Lawyer/Business			7.195***	14.471**				
			(2.729)	(6.473)				
Education								
High home					-7.378**	1.843		
					(2.888)	(6.513)		
High african					0.429	16.800***		
					(2.120)	(4.741)		
High western					2.326	8.814**		
					(1.787)	(3.894)		
Characteristics								
Log age beginning							0.516	1.614
							(0.758)	(1.573)
Long tenure							-3.821*	-3.701
							(2.048)	(4.425)
Interactions								
Communism*time	2.966***	0.251						
	(0.677)	(1.377)						
Socialistic*time	1.328*	1.391						
	(0.764)	(1.557)						
Nat_mil_soc*time	1.968***	2.670**						
	(0.574)	(1.161)						
Medicine*time			1.214	1.715				
			(0.893)	(1.543)				
Social*time			1.669***	-1.070				
			(0.587)	(1.216)				
Politic/Adm.*time			0.578	0.055				
			(0.797)	(1.655)				

Lawyer/Business*time			-2.307***	-3.415*				
			(0.882)	(1.795)				
High home*time					2.155**	0.241		
					(0.944)	(1.926)		
High african*time					-0.803	-6.107***		
					(0.673)	(1.342)		
High western*time					-0.937	-3.167		
					(0.575)	(1.092)***		
log age beginning*time							-0.914*	-1.930
							(0.485)	(1.601)
Long tenure*time							1.489**	1.693
							(0.646)	(1.188)
Observations	355	356	355	356	355	356	355	356
Countries	40	40	40	40	40	40	40	40
Wald chi2	150.18***	573.72***	152.08***	694.81***	a	656.42***	137.07***	a
aaR-sq within	0.2917	0.3487	0.2923	0.3445	0.2760	0.3811	0.2703	0.3423
R-sq between	0.3123	0.6621	0.3072	0.6817	0.4340	0.6761	0.2938	0.6544
LM chibar2	8.09***	175.10***	8.09***	177.89***	3.58**	208.96***	6.48***	195.25***

Notes: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term and period dummies. The dependent variables are 5-year average GDP growth per capita (growth) and 5-year avarage investment share of GDP (invest). a: Wald chi^2 reported as missing.

Table A2. Multiple logit / OLS, African initial conditions

	Initial log GDP	Democracy	Previous democracy	British colony	French colony
Ideology					
Communist	-.506	-2.353	.684	2.327	-1.284
	(.844)	(1.679)	(1.054)	(1.623)	(1.202)
African	1.499*	-1.069	-2.028*	1.580	.588
Socialist	(.819)	(1.562)	(1.227)	(1.638)	(1.111)
Conservative	-.555	-.377	.762	.819	-.419
	(.799)	(1.638)	(.975)	(1.784)	(1.105)
Pseudo R sq	.117				
LR chi squared	16.14				
Log likelihood	-60.727				
Education					
Primary	.352	-1.065	.286	-1.48	-.957
	(724)	(1.335)	(.984)	(1.404)	(1.069)
High home	-2.028*	-1.234	-.419	.571	-.686
	(1.217)	(1.736)	(1.391)	(1.769)	(1.582)
High African	.099	-3.235*	1.821	.606	-.538
	(.832)	(1.749)	(1.197)	(1.554)	(1.309)
High Western	-.193	-14.461	-.521	-15.676	-.611
	(1.079)	(2325.662)	(1.468)	(2263.706)	(1.311)
Pseudo R sq	.162				
LR chi squared	24.77				
Log likelihood	-64.192				
Profession					
Doctor	-.669	-2.027	3.432**	2.289	-1.859
	(1.099)	(1.923)	(1.646)	(1.784)	(1.865)
Social	-.152	-.780	2.195**	1.051	-.366
	(.691)	(1.284)	(1.019)	(1.301)	(1.115)
Political	.322	.253	2.649*	-.504	-2.439
	(.975)	(2.075)	(1.435)	(2.129)	(1.679)
Business / Law	.052	2.181	-.149	-2.231	.083
	(.939)	(1.902)	(1.432)	(2.201)	(1.263)
Pseudo R sq	.129				
LR chi squared	18.59				
Log likelihood	-62.896				
Age	5.033**	-5.789	-2.249	12.885**	.066
	(2.249)	(5.301)	(2.859)	(5.547)	(2.809)
Rsquared	.250				
F statistic	2.77				

Notes: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table A3a. Marginal Effects of ideology, conditional on time since independence

Years since independence	growth			investment		
	Com	Soc	Nat_mil_soc	Com	Soc	Nat_mil_soc
0	**-7.976*** **	-3.894	**-5.533*** **	0.899	-6.460	**-10.619*** **
	(2.080)	(2.409)	(1.810)	(4.507)	(5.835)	(4.297)
5	**-2.661*** **	-1.516	**-2.007*** **	1.349	-3.967	**-5.836***
	(1.050)	(1.272)	(0.956)	(3.001)	(4.209)	(3.123)
10	-0.863	-0.711	-0.814	1.501	-3.124	-4.218
	(0.824)	(1.025)	(0.770)	(2.817)	(3.964)	(2.961)
15	0.249	-0.213	-0.076	1.595	-2.603	-3.217
	(0.766)	(0.956)	(0.718)	(2.824)	(3.920)	(2.942)
20	1.056	0.148	0.459	1.663	-2.224	-2.491
	(0.774)	(0.958)	(0.719)	(2.887)	(3.943)	(2.968)
25	1.689	0.431	0.879	1.716	-1.927	-1.921
	(0.811)	(0.991)	(0.743)	(2.969)	(3.992)	(3.011)
30	2.211	0.665	1.226	1.760	-1.683	-1.452
	(0.858)	(1.036)	(0.777)	(3.056)	(4.052)	(3.062)
35	2.655	0.863	1.520	1.798	-1.474	-1.053
	(0.909)	(1.087)	(0.814)	(3.143)	(4.117)	(3.115)

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table A3b. Marginal effects, profession conditional on time since independence

Time since independence	growth				investment			
	med	social	pol/adm	law/bus	Med	social	pol/adm	law/bus
0	-3.443	**-4.820*** **	-1.240	**7.195*** **	-8.053	1.118	0.955	**14.471*** **
	(2.740)	(1.855)	(2.529)	(2.729)	(5.418)	(4.203)	(5.903)	(6.473)
5	-1.268	**-1.831** **	-0.205	**3.061** **	-4.981	-0.800	1.054	**8.352***
	(1.298)	(0.934)	(1.240)	(1.366)	(3.611)	(2.712)	(3.721)	(4.392)
10	-0.532	-0.820	0.146	1.663	-3.941	-1.449	1.087	6.282
	(0.935)	(0.709)	(0.903)	(1.053)	(3.313)	(2.453)	(3.274)	(4.040)
15	-0.077	-0.194	0.362	0.798	-3.298	-1.850	1.108	5.002
	(0.817)	(0.633)	(0.777)	(0.962)	(3.253)	(2.395)	(3.130)	(3.959)
20	0.253	0.259	0.520	0.171	-2.832	-2.141	1.123	4.073
	(0.810)	(0.623)	(0.749)	(0.963)	(3.273)	(2.406)	(3.099)	(3.970)
25	0.512	0.616	0.643	-0.322	-2.466	-2.370	1.135	3.344
	(0.855)	(0.643)	(0.771)	(1.006)	(3.326)	(2.447)	(3.121)	(4.021)
30	0.726	0.909	0.745	-0.727	-2.164	-2.558	1.144	2.743
	(0.920)	(0.676)	(0.815)	(1.065)	(3.393)	(2.500)	(3.169)	(4.090)
35	0.907	1.159	0.831	-1.072	-1.908	-2.718	1.153	2.233
	(0.992)	(0.716)	(0.869)	(1.129)	(3.466)	(2.558)	(3.229)	(4.166)

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table A3c. Marginal effects, education conditional on time since independence

Time since independence	growth			investment		
	home	african	west	home	african	west
0	**-7.378*** **	0.429	2.326	1.843	**16.800*** **	**8.814** **
	(2.888)	(2.120)	(1.787)	(6.513)	(4.741)	(3.894)
5	**-3.516*** **	-1.009	0.648	2.275	5.857*	3.140
	(1.335)	(1.028)	(0.864)	(4.090)	(3.132)	(2.703)
10	**-2.210** **	**-1.496** **	0.080	2.421	2.155	1.221
	(0.927)	(0.744)	(0.632)	(3.665)	(2.853)	(2.526)
15	**-1.402***	**-1.797*** **	-0.271	2.511	-0.133	0.035
	(0.785)	(0.640)	(0.554)	(3.572)	(2.788)	(2.500)
20	-0.816	**-2.015*** **	-0.526	2.577	-1.794	-0.827
	(0.773)	(0.620)	(0.546)	(3.595)	(2.797)	(2.522)
25	-0.356	**-2.187*** **	-0.726	2.628	-3.099	-1.503
	(0.821)	(0.641)	(0.570)	(3.665)	(2.837)	(2.564)
30	0.023	**-2.328*** **	-0.891	2.670	-4.173	-2.060
	(0.894)	(0.682)	(0.608)	(3.756)	(2.890)	(2.613)
35	0.345	**-2.448*** **	-1.031	2.707	-5.085	-2.533
	(0.974)	(0.730)	(0.651)	(3.855)	(2.950)	(2.666)

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.

Table A3d. Marginal effects, age and tenure conditional on time since independence

	growth		investment	
Time since independence	age	tenure	Age	tenure
0	0.516	-3.821	1.614	-3.701
	(0.758)	(2.048)	(1.573)	(4.425)
5	-1.122	-1.153	-1.843	-0.667
	(0.839)	(1.019)	(2.977)	(3.106)
10	-1.676	-0.251	-3.013	0.359
	(1.043)	(0.759)	(3.841)	(2.887)
15	**-2.019***	0.307	-3.736	0.994
	(1.189)	(0.667)	(4.397)	(2.837)
20	**-2.267***	0.711	-4.261	1.454
	(1.300)	(0.651)	(4.808)	(2.843)
25	**-2.463***	1.029	-4.673	1.816
	(1.390)	(0.671)	(5.133)	(2.874)
30	**-2.623***	**1.291***	-5.012	2.114
	(1.466)	(0.707)	(5.402)	(2.915)
35	**-2.760***	**1.514****	-5.301	2.367
	(1.530)	(0.750)	(5.632)	(2.962)

Note: *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]; standard errors in parentheses. All regressions include a constant term.