The Political Origins of the Africa's Economic Revival

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I. Introduction

Writing in the 1990's, William Easterly and Ross Levine famously labeled Africa a "growth tragedy".[1] Less than twenty years later, Alwyn Young noted Africa's "growth miracle"[2], while Steven Radelet less effusively pointed to an Africa that was "emerging" and noted its rising rate of economic growth, improving levels of education and health care, and increasing levels of investment in basic infrastructure: roads, ports, and transport[3]. In this paper, we address Africa's economic revival. In doing so, we also stress the political changes that have taken place on the continent. Once notorious for its tyrants – Jean-Bedel Bokassa, Idi Amin, and Mobutu Sese Seko, to name but three – in the 1990s, Africa joined the last wave of democratization; self-appointed heads of state were replaced by rulers chosen in competitive elections. In this paper, we assert that the two sets of changes – the one economic and the other political – go together, and that, indeed, changes in Africa's political institutions lent significant impetus to its economic revival.

While advancing this argument, we pay particular attention to the rural sector of Africa's economies. Agriculture constitutes the largest single sector in most of Africa's economies (Figure 1) and the interaction between the public policy and the economics of agriculture have received great attention (Bank 1981; Bates 1981; Krueger, Schiff et al. 1992; Bank 2007). Our thesis is radical in its simplicity: As a result of changes in political institutions, politicians in search of office in Africa encountered strong incentives to champion new policies and as a result of the changes in government policies, total factor productivity – in agriculture and in the economy as a whole – rose, rekindling economic growth in the continent.

In Section 2, we present data on the changing performance of Africa's economies and document both their decline and resurgence. We also seek the source of these changes and attribute most to changes in the rate of growth of total factor productivity. In Section 3, we document changes in the policies pursued by Africa's governments and in the structure of its political institutions. In Section 4, we introduce quantitative evidence of these changes. And in Section 5 and 6, we mount our central argument: that changes in political institutions promoted subsequent changes in public policies and that changes in public policy established the link between institutional reform and economic growth in Africa.

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[1] Easterly, W. and R. Levine (1997). "Africa's Growth Tragedy: Policies and Ethnic Divisions." Quarterly Journal of Economics **112**(4): 1203-1250.

[2] Young, A. (2012). The African Growth Miracle. NBER Working Paper No. 18490. Cambridge, MA, NBER.

[3] Radelet, S. (2010). Emerging Africa: How 17 Countries Are Leading the Way. Washington, DC, Center for Global Development.

II. What is to be explained

In this section, we note the decline and revival of Africa's economies. We turn first to the rural sector and then to national economies.

A. The Rural Sector

As can be seen in Figure 1, the growth rate of the value of total output began to decline in the years after independence[4], falling dramatically in the 1970s and then reviving in the late 1980s and 1990s. Crop productivity (TFP) growth followed a similar pattern, falling below zero during the late 1970s and early 1980s.[5] It is clear from Figure 1 that since the mid-1980s, crop TFP growth has played an increasingly important role in driving growth in agricultural value added.[6]

B. The National Economy

Figures 2 and 3 report the results of a similar exercise, but this time using data for Africa's national rather than rural economies. Figure 2 depicts changes in the rate of growth of GDP and GDP per worker, 1960-2010. As did the growth rates in agriculture, the rate of growth of the Africa's national economies trace a U-shaped path, with growth rates declining from the 1970's to the late 1980s and then turning upwards. As captured in Figure 3, the contributions of the stock of capital per worker and human capital to the growth of GDP varied little over time, by comparison with the contribution made by changes in TFP. As was the case with agriculture, changes in the value of production – and the value of production per capita – was the result of not of changes in the quantity and quality of labor and capital but rather in the efficiency with which they were employed.[7]

III. Background

In this section, we note the changes in the public policies and political institutions that prevailed in Africa in the decades after independence.

A. Policies

In seeking to account for Africa's growth decline – that is, the descending portion of the U-shaped trajectories discussed above -- researchers have highlighted the public policies imposed by its governments.

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[4] Conventionally dated at 1960.
[5] Crop TFP growth results are from Block (2014a), which includes 27 countries from sub-Saharan Africa from 1960 – 2008.
[6] Yet, most of the growth in Africa's agricultural output over these decades resulted from expanding the area under cultivation. See World Bank, World Development Report 2008.
[7] Growth accounting results are from Block (2014b) and UNECA (2014).

Agricultural policies were "urban biased," in the phrasing of Michael Lipton.(Lipton 1977; Bank 1981; Bates 1981). Governments imposed trade policies that provided protection for manufacturers but not for farmers. They regulated industries and markets in ways that created monopsonies among those who purchased agricultural commodities and monopolies among those who produced purchased by farmers: clothing, soap, kerosene cooking oil and other goods. As a result, urban consumers of food or raw materials could purchase agricultural commodities at prices lying below those in international markets; and they could sell the products they manufactured to farmers at prices that lay above global levels.

As for Africa's economies as a whole, government policies tended to be highly interventionist. In the words of Collier and O'Connell (Collier and O'Connell 2008), Africa's governments tended to impose "control regimes." Either by manipulating the structure of markets or by replacing private markets with government bureaucracies, they sought to influence the manner in which land, labor and capital were allocated; commodities produced and distributed services furnished and incomes determined.

In the manufacturing sector, governments often created monopolies, often in a manner designed to protect the fortunes of state owned firms. In the financial sector, many nationalized the insurance industry and regulated banking, lowering interest rates in an effort to cheapen the costs of capital for local businessmen. And when addressing the macro-economy, governments extended their reach to include markets for foreign exchange. Compared to others, governments that implemented control regimes tended to over-value the local currency, seeking thereby, many claimed, to make it possible for local firms to import capital equipment more cheaply (Bates 2008).

Government policies undermined the well-being of farmers. One result was an exodus from countryside of the young and able bodied; the contrasting demographic structures of the urban and rural populations testified to the economic disparities between town and country in Africa. Another was the slowing rate of investment, made manifest by the aging tree stock in the coffee and cocoa industries.[8] A third was the lower output, as producers curtailed the effort they devoted to farming.

As for the national economies: the result was a lowering of the growth rate. As demonstrated by(Collier and O'Connell 2008), in countries whose governments imposed control regimes , the rate of economic growth was two percentage points lower than in those in which governments refrained from large scale interventions in markets and industries.

B. Institutions

Political change in Africa was marked not only by changes in public policies but also by changes in political institutions.

i. The Authoritarian Period

As stressed by keen eyed observers (Dumont 1962; Rodney 1972; Fanon 1991), soon after the achievement of self-government, African states put an end to party competition.

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[8] See the reports of the Internal Coffee Organization.

In Parliaments, members of the opposition crossed the floor to join the ranks of the governing party. Where their opponents proved obdurate, governments often reverted to coercion (Collier 1982): many made use of the laws of detention to which they had themselves had been subject in the colonial era. Shortly after independence, another trend emerged: the formation of military governments. As captured in figure 4, single party and "no-party" (i.e. civilian dictatorships or military governments) ruled in over three quarters of the country years of the 1970s – and continued to do so for the next twenty years.[9]

ii. Pressures for Change

By the end of the 1970s, the international community was fully aware of Africa's economic plight. Emboldened by the reformist mandate bestowed by its President, Robert McNamara, the World Bank had financed a dazzling array of small-farer and community-level projects. As recounted in its official history, the World Bank's own evaluations revealed a distressingly low rate of return for its Africa projects (Kapur 1997). When seeking reasons for the failure of its projects, the Bank found them in "the policy environment." In its famed "Berg Report," for example, it highlighted the impact of government policies in Africa that distorted markets, weakened incentives, and thereby undermined its rural economies.

In addition to being a financer of projects, the World Bank then became an advisor to governments. In pursuit of policy change, it drew upon two sources of strength. The first was expertise. Through publications, seminars, and the training of public servants, the Bank sought to expose the economic costs of prevailing policies and to offer alternatives. The second was capital. In any given country at any given time, the Bank would normally finance a multitude of projects: so small was each that its cancellation would hardly go noticed. To gain the attention of the beneficiary governments, (Please 1984) writes, the Bank therefore began to bundle its projects into sectoral programs; more would then be at risk were the Bank to suspend its lending. Sectoral programs soon gave way to country programs and to conditionality, as the Bank sought to strengthen its leverage over policymaking in debtor nations and to sharpen the incentives for policy reform.

As Africa's creditors focused on the behavior of Africa's governments, they struggled with the question: Why would these governments adopt policies that undermined economic prosperity? Over time, a consensus emerged: that the behavior of these governments reflected their lack of political accountability. Not being accountable, governments in Africa could adopt policies that conferred concentrated benefits on the elites while imposing widely distributed costs on others. Increasingly, then, the World Bank focused not only on policy choice but also on institutional reform (Bank 1989; Bank 1991).

Among the most vocal of those championing political reform was Keith Jaycox, vice president of the World Bank. In meeting after meeting, conference after conference, and interview after interview, he

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[9] Much of the material in the next several paragraphs comes from Bates, R. H. (2008). When Things Fell Apart: State Failure in Late Century Africa. New York, Cambridge.
      pp. 113-115.

called for the introduction of political reforms. As reluctant as he may have been to call for the introduction of democratic institutions, he left little doubt that Africa's creditors would welcome the legalization of opposition parties and the holding of competitive elections for political office.

Demands for political reform also arose from within. Benin provides an apt illustration. In 1975, the ruling party had endorsed "Marxist-Leninism" and the government had altered its policies and expanded its bureaucracy accordingly. By the late 1980s, the decline of the private economy had impoverished the government's tax base, even while its expenses grew, and the government lacked the funds to pay its workers. The result was wave after wave of demonstrations by public employees and increased indiscipline within the ranks of the military. While unable to meet the salaries of those it employed, the political elite nonetheless managed to find ways to pay itself: In 1988, the issuance of $500 million in unsecured loans to the president and his retinue led to the collapse of three state-owned banks. Such acts inspired further demonstrations, encouraged and cheered on by ambitious challengers to the incumbent regime.

Initially, the forces of reform were stymied. Illustrative is the case of Zaire, where the United States continued to support its president, Joseph Mobutu, even as Mobutu continued to ruin the nation's economy. As recounted by (Ndikumana and Boyce 2011), p. 2:

> In 1987, … under pressure from the US government, [the IMF approved a new loan to Zaire] over strong objections by senior staff and a rare dissenting vote by three members of the Funds twenty-four member executive board. This was among the decisions that prompted the resignation of David Finch, director of the IMF's exchange and trade relations department ….

During the Cold War, the United States employed development assistance and international finial institutions to stabilize regimes that supported its fight against communist-backed movements in the developing world. Security interests trumped development policy.

iii. Political Change

But then, in 1989, everything changed. Marked by the collapse of the Berlin Wall, Eastern Europe withdrew from the communist bloc. When Russia subsequently withdrew from the Soviet Union, the Cold War was over. In Africa, international financial institutions were then able to join domestic political forces in backing the forces of political change.

By way of illustration, we return to the case of Benin. Emboldened by the toppling of governments throughout Eastern Europe, the opponents of President, Mathieu Kerekou flooded into the streets of the national capital, mounting waves of protest that brought the capital to a standstill. The president was forced to call for a "*Conference Nationale des Forces Vives*" at which business, professional, religious, labor, and political groups, together with the government, would be given an opportunity to draw up a new constitutional framework" (Meredith 2005), p. 388). The president had expected to dominate the proceedings of the conference, but he failed to do so. Declaring themselves a sovereign assembly, the conference dissolved the government, appointed a new prime minister, and lay down a schedule for new elections – elections that Kerekou lost to Nicephone Soglo, the assembly's preferred candidate – and formerly a member of the board of directors of the World Bank.

As shown in Table 1, Benin's national assembly was soon followed by others; in every case but one, an election followed; and in over half, the incumbent regime was dismissed from office. Whereas before the 1990s, in most African states, competition for office took place at the top, as it were -- i.e. either within the ranks of the military or the confines of the sole legal party -- in the 1990s, open electoral competition became the norm.

In the sections that follow, we argue that these political reforms led to policy reforms, and that policy changes inspired the growth of total factor productivity, thereby leading to the renewal of economic growth in Africa.

IV. Bivariate Evidence

The better to ground our argument, we turn to quantitative data. We first tend to matters of definition and then turn to scrutinizing the (bivariate) relationships between institutions, policies, and economic performance. Before doing so, we tend to matters of definition.

A. Definitions

i. Institutions

For the analysis that follows, we create a dummy variable that takes the value 1 the head of state is chosen in a competitive election and 0 otherwise. To do so, we make use of a measure[10] that maps country-years to numbers in the following fashion:

Level 1 -- No executive exists.

Level 2 -- Executive exists but was not elected.

Level 3 -- Executive was elected, but was the sole candidate.

Level 4 -- Executive was elected, and multiple candidates competed for the office; opposition parties not allowed.

Level 5 – Executive was elected and multiple parties were legally permitted by law to compete for the office.

Level 6 -- Candidates from more than one party actually compete in the election, but the President wins more than 75% of the vote.

Level 7 -- Candidates from more than one party competed in the election, and the President won less than 75% of the vote.

Making use of this measure, Figure 5 captures the rapid increase in the incidence of competitive electoral systems across Africa during the 1990s.

ii. Policy Choices

When focusing on agriculture, we make use of a measure derived by the World Bank when preparing for the 2008 World development Report, which focused on agriculture (Bank 2007). Called the Relative Rate of Assistance, or RRA, the measure reflects the manner in which government intervention in markets shifts relative prices between agricultural and non-agricultural commodities and is calculated as the ratio of policy interventions across sectors:

$$(1) \qquad RRA = \left[\frac{1 + NRAag^t}{1 + NRAnonag^t} - 1 \right]$$

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[10] See Bates, R. H., K. Ferree, et al. (1996). Toward the Systematic Study of Transitions. Development Discussion Paper No. 256. Cambridge MA, Harvard Institute for International Development.
and Beck, T., G. Clarke, et al. (2001). "New Tools and New Tests in Comparative Political Economy: The Database of Political Institutions." World Bank Economic Review.

where NRAag and NRAnonag refer to the Nominal Rates of Assistance to the producers of agricultural and non-agricultural products. The assistance takes the form of policies that alter the level of domestic prices relative to those in global markets. The imposition of an ad valorem tariff on imports of manufactured goods, for example, would generate an increase in the NRAnonag and therefore trigger a decrease in the RRA, thus signaling a shift in relative prices against farmers and in favor of the manufacturing sector. Negative values of RRA indicate that government policies favor consumers of agricultural products, i.e. the presence of urban bias; a positive increase indicates a shift in favor of agricultural producers.

When focusing on the national economy, we make use of the black market premium (BMP). Because the premium reflects the over valuation of the exchange rate (see below) it can be viewed as a measure of the taxation of exports and the undercutting of import competing products; in Africa, the first includes cash crops, such as coffee or cocoa, and the latter food crops, such as rice. The magnitude of the BMP therefore provides a second measure of the degree of the government's policy bias against agriculture.

Insofar as the exchange rate is one of the basic prices of the macro-economy, the BMP reflects as well the level of disequilibrium in the macro-economy, be it in the balance of fiscal, monetary, or trade accounts.

Our last measure of public policy arises comes from the work of (Giuliano, Mishra et al. 2013). Using data from the International Monetary Fund (IMF), the World Bank, central banks, and other sources (Giuliano, Mishra et al. 2013) constructed a composite index of regulation, noting the degree to which governments imposed restrictions and controls in product markets, agriculture, trade, and finance.

iii. Economic Performance

Lastly, as our measure of economic performance, we make use of the work of Block, who calculated the rate of growth of total factor productivity in the agriculture sector (Block, 2014a) and the nation economies of Africa (Block, 2014b). Block derived his estimates from the standard Solovian transformations of a Cobb-Douglas production function with constant returns to scale. Dividing human capital and capital stock by the amount of labor renders these variables into per capita measures; taking the log of the production function, renders them additive. Differentiating with respect to time and re-arranging terms yields the basic growth accounting equation:

(2)
$$\frac{\dot{A}}{A} = \frac{\dot{y}}{y} - \left[\alpha \frac{\dot{k}}{k} + (1-\alpha)\frac{\dot{h}}{h}\right]$$

The first term is the Solow residual; it is the difference between terms that refer to the growth rate of output per capita, y, and an expression that refer to the growth rate of the quantity of materials – capital and human capital per worker – employed to produce it.[11] $\frac{\dot{A}}{A}$ does not vary as a result of the

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[11] As the dot indicates a derivative with respect to time, $\dot{k}/k$ is the growth rate of capital per worker; and $\dot{h}/h$ is the growth rate of human capital; and $\dot{A}/A$ is the growth rate of total factor productivity.

quantity of the factors of production, then, but rather as a result of the degree to which those factors are productively and efficiently employed. It is a measure of total factor productivity (TFP) growth.[12]

Appendix A lists the measures we employ, characterizes them, and notes the sources from which they came.

B. Bivariate Relationships

Employing these measures, we can now turn to the use of quantitative data. Doing so enables us to demonstrate the plausibility of our conjecture – that political change in Africa promoted policy change in Africa, which in turn helped to fuel the continent's economic revival.

i. Electoral Reform and Policy Choice

Drawing on data from 30 African countries, 1975 – 2005, in Figure 6, Panel A depicts the level of RRA before and after transition to electoral competition. Panel B depicts differences in the level of RRA in countries with and without competitive elections over the same time period. In both panels, the data suggest that countries that reformed their institutions changed their policies and did so by reducing the degree of urban bias. Tests suggest that the differences in are significant at less than the 0.01- level.

In Figure 7, Panel A portrays the relationship between the magnitude of the black market premium before and after the transition to electoral competition; Panel B depicts the difference in the level in countries with and without competitive elections for the chief executive.[13] Figure 8 contrasts the degree to which governments intervene in markets and industries before and after the introduction of party competition (Panel A) and in countries with and without heads of state who have gained power in competitive elections (Panel B). The patterns are what one would expect were the introduction of party competition to be related to political reform and the value of the t-statistic suggests that the values in these series differ at less than the 0.01-level. The differences in the levels of regulatory reform, however, disappear when controlling for country fixed effects (suggesting the potential for alternative explanations – to be explored below).

Importantly for the work ahead: note that in each instance the data in Panel A suggest that institutional reform *antedated* policy reform – a finding that helps us to identify the causal nature of the relationship between them.

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[12] This equation underpins the identification of the sources of growth in output per capita.
[13] The before/after analyses in panel A of figures 7 and 8 are estimated based on equation 5, below.

ii. Policy Choice and Economic Performance

We hypothesize that these policy choices are the mechanisms through which the reform of Africa's political institutions contributed to productivity growth. Figure 9 repeats the before/after analysis with TFP growth as the dependent variable, while Figure 10 repeats the growth decomposition of Figure 3, this time distinguishing between settings with and without electoral competition. The contrasts are striking; but, being limited to two dimensions, they require – and warrant -- further examination.

V. A Causal Chain?

On the basis of the evidence thus far, it appears possible that that changes in Africa's political institutions led to changes in policy choices, and that the latter altered incentives, enticing producers – in the rural sector and in the economy as a whole – to make more efficient use of the factors of production. Before this argument warrants our credence, however, we must take two additional steps. First, a line of reasoning must be advanced. It is plausible, of course, that policies that impose costs on producers will weaken economic incentives and lower the rate of growth of TFP. But why should changes in political institutions elicit changes in public policies? In this section, we address this question and seek thereby to strengthen the foundations of our argument. In addition, we need to move from the bivariate to multivariate analysis and so gain the ability to identify our causal argument. We take that second step in Section VI which follows.

A. In Agriculture

Why might the movement from authoritarian government to party competition lead to changes in agricultural policy? In both authoritarian and competitive political systems, private interests influence the government's choice of policies. But the process of representation differs in the two systems. Under authoritarianism, representation is secured through lobbying; it is undertaken by interest groups. In competitive political systems, however, representation is undertaken by political parties, as they seek to build constituencies of sufficient size to secure a majority of votes in elections. The implications are immediate and bear upon the nature of policies.

The relationship between political reform and policy change in developing be derived from well-established insights into the behavior of poor populations and the structure of their economies on the one hand and from the logic of collective action and party competition on the other.

Poor countries exhibit a characteristic political-economic geography.[14] The majority of the population works in farming; it lies widely scattered, each member producing but an infinitesimal percentage of the

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[14] This is the result of Engel's law, which holds that as income rises, the proportion of income spent on food declines; the income elasticity of food consumption is less than unity. From this micro-level regularity a macro-level implication follows: that economic development implies structural change (Kuznets 1966; Chenery and Taylor 1968; Anderson and Hayami 1986; Lindert 1991; Matsuyama 1992).

total agricultural output. A small portion of the population – often less than 10% -- works in manufacturing and service provision and dwells in towns. Because government policies often favor large investments and because of economies of scale in manufacturing, urban firms are often few in number and large in size, and a significant percentage of the urban dwellers therefore derive their incomes from a small number of employers (Little, Scitovsky et al. 1970; Little 1982; for an African case, see (Kaplinsky 1978)). While those who farm are thus dispersed, economically and geographically, those who earn their incomes in the urban sector are not. Spatially, they are concentrated in a few settlements and economically they often labor in enterprises sufficiently large to dominate their markets.

The political implications are ironic and follow from the logic of collective action (Olson 1971, 1985): In countries with large agricultural populations, farmers form a weak political lobby. Being small, individual farmers in poor countries rationally refrain from expending effort in attempts to influence agricultural prices; not so urban interests, which stand large in their markets. Being widely scattered, farmers face high costs of organizing; concentrated in towns, urban interests find it less expensive to do so. Urban interests therefore hold a relative advantage as lobbyists in less developed economies. In so far as government policy is influenced by organized groups, in countries with large agricultural sectors, it tends to be adverse toward the interests of farmers (Olson 1971 and 1985; masked).

The result is a choice of public policies that, taken together, constitute "urban bias," or measures that privilege the incomes of the urban sector at the expense of the rural. Under pressure from urban interests, governments adopt trade policies that protect domestic markets for urban manufacturers while leaving the market for agricultural products open to imports from abroad. The overvaluation of currencies cheapens imports of foreign foodstuffs and lowers the earnings of exporters of cash crops. Government regulations limit exports of raw materials, compelling farmers to sell cotton, vegetables, fruits, and other products to local processors at prices below those that they could secure were they to ship them to foreign buyers. In these and other ways governments intervene so as to shift relative prices in favor of consumers and against the producers of agricultural products.

Thus the standard account of urban bias. Central to this interpretation is the absence of electoral competition; interests, it assumes, gain representation solely by lobbying. But what if we now introduce competitive elections? Where representation is achieved through electoral channels and where rural dwellers constitute a large segment of the voting population, then politicians have an incentive to cater to the interests of farmers. The very factors that render farmers weak lobbyists – that they are numerous and spatially dispersed – render them attractive to those competing for an electoral majority (Varshney 1995). The search for political majorities should therefore encourage politicians to resist the

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When people are poor, a large percentage of their total expenditure will be devoted to food; absent foreign trade and significant economies of scale in farming, the rural sector therefore will be large. But when people earn higher incomes, the percentage spent on food will be less and, absent a comparative advantage in global markets, the rural sector will then comprise a smaller portion of the economy.

political pressures emanating from urban consumers and to champion policies that cater to the interests of the countryside.

Many African economies conform to the conditions that underpin the above argument. Their mean income in is less than $1,000 per annum (constant $US2000) and in most countries, agriculture remains the largest single industry, employing nearly a third of the labor force and harboring nearly three quarters of the population. By the logic of the argument, we should therefore expect to see the reintroduction of party competition and majoritarian politics leading to the adoption of policies that strengthen the incentives for farming.

B. In the Larger Economy

A second line of reasoning argues that, if authoritarian, governments will seek to transform markets into political organizations, but that when economic agents are enfranchised, they might instead prefer that markets be left free. To make the point, we focus on the market for foreign exchange, which is important both for agriculture and the larger economy.

Throughout this section, we make use of Figure 11, which depicts the market for foreign exchange. The market equilibrates when exporters supply and importers demand equal amounts of "dollars"; they do so when the exchange rate is 10 *cedis* to the dollar. Now let the government intervene. Insisting that the *cedi* is stronger than private agents realize, it dictates that an importer need pay but 5 *cedis* when purchasing a dollar and the central bank purchases dollars for *cedis* accordingly. Now receiving fewer *cedis* for each dollar, exporters now ship fewer goods abroad. . At this rate of exchange, those who produce goods that can be imported from abroad now face greater competition; goods that might have cost 100 *cedi* now cost but 50. As a result, hey too produce less. The "real economy" therefore declines, along with the incomes of those who labor in it.

Who benefits from the government's policy? Among the beneficiaries are those who earn their incomes in *cedi* but who spend them in dollars*;* and among those who do so, of course, number governments. They can now purchase a dollar for 5 *cedis* whereas they previously to pay 10. Not only that: given the government's intervention in the market, they can multiply their earnings many fold (given the prices depicted in Figure 9). For at 5 *cedis* per dollar, the market is not in equilibrium: the quantity of dollars demanded exceeds the quantity supplied. Given that exporters lack the incentives to produce more for export, the supply of dollars is quantity constrained; the market can only equilibrate as a result of changes in price. The price of dollars therefore rises; it rises above its market price. By seeking to lower its price, the government has rendered foreign exchange scarce and therefore more costly. It has created a "black market premium" for foreign exchange.

Returning to the actors in this story, we have already noted that government's management of the exchange rate redistributes purchasing power from those who produce goods to those who, like the government, produce services. Now we can see that these measures have also created an economic resource. If a minister or permanent secretary can secure foreign exchange at the official price – 5 *cedis*

to the dollar – she can then sell them in the black market for 15 *cedis* to the dollar, tripling her earnings.[15]

When those with power employ it to regulate and restructure markets – such as the market for foreign exchange – the result is then the concentration of income in the hands of those with the power to govern. They become more prosperous even while total output is declining in the traded sectors. While such an outcome might be stable under authoritarian regimes, with the political enfranchisement of economic agents, politicians go in search of votes and would be less inclined to restructure markets in this manner. Those victimized by these interventions would be reluctant to vote for those who did so. .

We have focused on the market for foreign exchange because it is of great relevance both to agriculture and the national economy. Were we to look at the governments' intervention in markets for credit or transport or the subsidized provision of fertilizers or pesticides, we would encounter similar incentives at work – incentives that tie changes in the structure of institutions to changes in the inclination to intervene in markets.

VI. Multivariate Analysis

Emboldened by this reasoning, we return to the use of quantitative data, this time making use of multivariate methods in order to identify the relationships between institutional change, policy choice economic performance.

Throughout, we adopt a difference-in-difference specification. Given that the treatment, institutional change, occurred at different times in different countries, our model takes the form of a fixed effects regression with individual year dummies:

$$(3) \qquad Y_{it} = \alpha_{0i} + \alpha_{1i}t + \lambda_t + \delta D_{it} + X'_{it}\beta + \varepsilon_{it}$$

where Y_{it} is the growth rate of productivity in country *i* in year *t*, α_{0i} are time-invariant unobservable country effects, λ_t are year dummies, X is a vector of observed covariates, and D_{it} is a dummy equal to one for each country-year observation in which there is electoral competition. δ is the coefficient of interest; it provides a measure of the relationship between the nature of political institutions and – depending on the context -- the growth of TFP in agriculture or in the greater economy. α_{1i} is a country-specific trend coefficient multiplying the time trend *t*; it provides a test of the identifying assumption of common trends implicit in difference-in-difference specifications.

We also employ a form of "mediation analysis" to determine whether the relationship between institutional change and changes in the rate of growth of total factor productivity runs through changes in public policies. In our analysis of the agricultural sector, we do so by estimating three linear regressions (Imai, et.al. (2011)):

(4) $\qquad\qquad a)\ Y_i = \alpha_1 + \beta_1 T_i + X_i\varphi_1 + \varepsilon_{i1}$

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[15] While producing nothing.

$$b) \; M_i = \alpha_2 + \beta_2 T_i + X_i \varphi_2 + \varepsilon_{i2}$$

$$c) \; Y_i = \alpha_3 + \beta_3 T_i + \gamma M_i + X_i \varphi_3 + \varepsilon_{i3}$$

where *Y* is the outcome variable (agricultural TFP growth), *T* is the treatment variable (electoral competition), and *M* is the mediating variable (RRA or BMP), and *X* is a vector of control variables. When we turn to TFP growth in the economy as a whole, we do so less formally and note whether the relationship between policy choice and the growth of TFP responds to the introduction into the model of measures of public policy.

A. The Agricultural Sector

We turn first to the relationship between political reform and the growth of total factor productivity in agriculture. Using data from 27 countries over 46 years (1961-2007), Table 2 explores the relationship between political institutions and TFP growth in agriculture.

i. Institutions and Economic Performance

ELECOMP67 takes the value 1 when the measure of party competition registers either a 6 or a 7, i.e. its two highest values. We find that by comparison with those subject to authoritarian regimes, farmers in countries governed by heads of state who gained power in competitive elections exhibit significantly higher rates of total factor productivity growth. The result is robust to the inclusion of control variables: civil conflict, the average level of electoral competition in bordering states, and rural population share. Civil conflict was endemic in late century Africa, with 40% of countries experiencing at least one year of civil war between 1960 and 2000. Noting their occurrence enables us to control for the possibility that political competition affects TFP growth through its impact on political stability (Snyder and Mansfield 2000). If electoral competition were to generate strong political or economic forces, then their impact could spill across political boundaries; by controlling for the lagged average of the degree of electoral competition in each country's neighbors, we control for this possibility as well. Lastly, note that the coefficient on percentage of the population living in rural areas captures the impact of a wide range of other variables: income, urbanization, media exposure and others of the so-called :modernization" variables (Lerner 1956). By including a measure of the relative size of the rural population, we thereby control for the impact of these unobserved variables. Inclusion of country-level fixed effects helps to control for the impact of other unobserved, time-invariant variables – such as climate; and the inclusion of annual fixed effects enables us to control for the impact of common shocks, such as price changes in global markets.

An additional threat to identification in difference-in-difference models is the possibility that the effect (agricultural TFP growth) precedes the treatment (political reform). To assess this possibility, we follow Angrist and Pischke (2009) who invoke a form of Granger causality:

$$(5) \qquad Y_{it} = \alpha_i + \lambda_t + \sum_{\tau=0}^{m} \delta_{-\tau} D_{i,t-\tau} + \sum_{\tau=1}^{q} \delta_{+\tau} D_{i,t+\tau} + X_{it}' \beta + \varepsilon_{it}$$

The model allows for m lags (post-treatment effects) and q leads (anticipatory effect). Figure 12 graphs the coefficient estimates of these post- and pre-treatment effects on agricultural TFP growth for $m = q = 4$ leads and the lags surrounding the year in which each country transitioned into a system of competitive elections. The results indicate no significant anticipatory effect on changes in agricultural productivity. The difference between the mean coefficients before and after political transition is 0.56 percentage points, a magnitude consistent with the estimates in Table 2.

ii. Political Reform and Policy Choice

Table 3 captures the relationship between institutional reform and changes in the relative rate of assistance (RRA), our measure of policy bias against agriculture. Column 1 suggests a negative relationship between electoral competition and the level of urban bias.[16] The addition of country-specific trends in columns 2 renders the coefficient insignificant, however.

While the risk of reverse causality[17] is minimal, we remain keenly aware of the possible impact of excluded variables. As expected, the IMF dummy enters positively and significantly in columns 1-2. There is an additional concern, however: that IMF agreements may not be randomly distributed across countries. We therefore estimate a two-stage model in which we, as do others (e.g. Easterly 2005), instrument for IMF agreements using each country's level of US military assistance and previous colonial status.[18] We report the results in column3 and 4.[19]

iii. Political Reform, Policy Choice and Economic Performance

Table 4 closes the circle. We evaluate these relationships with the growth of TFP at the 25th, 50th, and 75th percentiles of the distribution of rural population share. While RRA fails to provide a medium through which electoral competition affects TFP growth when the share of rural population is small, at the 75th percentile, RRA accounts for nearly 14% of the total effect of electoral competition on TFP growth

B. The Greater Economy

When we turn to the analysis of the greater economy, we continue to employ a difference-in-difference framework and proceed in similar fashion, first exploring the link between institutional reform and the growth of total factor productivity (Table 5); then turning the relationship between institutional change and policy reform (as measured by changes in the black market premium in Table 6 and the level of government intervention in markets and industries in Table 7); and concluding by assessing the degree

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[16] Recall: Positive changes in RRA indicate *less* urban bias, that is, more favorable policies toward agriculture.

[17] In the sense that RRA would cause electoral competitiveness.

[18] Easterly (2005) argues that US military assistance is indicative of the recipient as being a "friend of the donor," and thus a correlate of IMF agreements, while not affecting (in our case) agricultural price policy via any other channel. The F-tests of excluded instruments on 2SLS versions of the regressions on columns 7 and 8 are 8.6 – suggesting the possibility of weak instruments. This is of secondary concern, as our primary focus is on the effect of electoral competition, rather than on the specific effect of IMF agreements, however.

[19] Including country-specific time trends in columns 2 and 4 reduces the precision of our estimates. This may raise questions regarding our identifying assumptions, but may also simply result from the loss of degrees of freedom.

to which policy change in the form of regulatory reform provides a channel between institutional reforms and changes in total factor productivity, as our reasoning suggests.

i. Omitted Variables

As when exploring the revival of Africa's agricultural sector, when exploring the resumption of total factor productivity growth in Africa's national economies, we focus on the impact of institutional reforms and policy change. Clearly, other variables have influenced Africa's economic performance. To purge our estimates of the bias that may result from their impact, we introduce a series of controls.

> We include in our model measures of the economic significance of ore, fuel, and metal in exports.

> While we have focused on the significance of institutional change, a second political factor could be significant: conflict, and specifically civil wars, whose number, intensity and geographic spread waxed and waned over the sample period. We therefore include a dummy that takes on the value 1 for each country year in which there is was civil war.

> The continent of Africa contains over 50 countries and most are small. Forces that operate in one country can impinge upon events in another. We therefore control for the level of institutional reform in a nation's neighbors.

> We control as well for whether a country was participating in a program under the direction of the International Monetary Fund. Given the growing importance of conditionality – which over time came to include institutional measures – the possibility arises that policy choices and economic performance on the one hand and institutional changes on the other could be related because of being joint products of IMF interventions.

> We control as well for the influence of other economic variables, including:

> o The demographic structure of the population.

> o Given the absence of irrigation and the importance of agriculture to Africa's economies, the level of rainfall.

Since the transition into a competitive electoral system is not random, these additional variables also include time-varying factors that might influence selection into "treatment." To control for the possibility that countries might "select into treatment" based on time-invariant unobservables we introduce fixed effects.[20]

Inclusion of these variables also enables us to evaluate alternative interpretations of Africa's economic revival. One is that the renewal of economic growth in Africa is the result of an increase in the demand

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[20] From an econometric perspective, then, our claim is that based on these control variables, selection into electoral competition is conditionally independent.

for raw material in emerging markets rather than political reform at home.[21] Another is that it results from the pass-through of a "demographic bulge," as youths now enter the work force – a phenomenon that some argue once fueled the growth of the economies of Asia.[22] A third would attribute it to the return to peace in the early 20th century and the enjoyment of a "peace dividend". The inclusion of these control variables in our estimates thus sheds additional light on sources – and sustainability – of Africa's growth surge.

ii. Additional Sources of Bias

In addition to omitted variables, a reciprocal relationship between TFP growth and institutional reform, would result in biased estimates. We have found it difficult to locate valid instruments[23] and therefore introduce temporal lags in order to counter this source of bias. For each country we collapse the annual observations into successive periods, each consisting of a 5-year average, and then lag all of the explanatory variables (except rainfall) by one 5-year period.[24]

Additional difficulties arise when we attempt to control for the impact of the International Monetary Fund (IMF), which played a major part in the programs of reform in late century Africa. Participation in an IMF program might signal a country's determination to introduce both political and economic reforms. Attempting to correct for the bias that might therefore arise, we explored the use of instrumental variables, including the level of United States military aid and an indicator of how "friendly" a country was to the United States and Europe as indicated by voting patterns in the United Nations and trade partners.[25] Judged by their Kleibergen-Paap Wald F-statistics, these instruments proved weak, however. Once again, we therefore have relied upon 5-year lags to counter the introduction of bias.

A similar problem arises with respect to oil or mineral deposits. As discussed in the literature on the "resource curse," countries thus endowed both falter economically and tend to remain authoritarian in their politics. [26] In this instance too, we were unable to find valid instruments and therefore reverted to the use 5-year lags to check against endogeneity bias.

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[21] Brautigam, D. (2010). The Dragon's Gift: The Real Story of China in Africa. Oxford and London, Oxford University Press.

[22] Bloom, D. E. and J. G. Williamson (1997). Demographic Transitions and Economic Miracles in Emerging Asia. NBER Working Paper No. 6268. Cambridge MA, National Bureau of Economic Research

[23] Those that come to mind – such as settler mortality, whose relationship to political institutions is by now well known – are often non-time varying, and so not useful in this panel setting.
[24] Averaging offers the additional advantage of smoothing out the year-to-year data, eliminating "noise".
[25] Dreher, A., J.-E. Sturm, et al. (2013). Politics and IMF Conditionality. KOF Working papers 13-338. Zurich, KOF Swiss Economic Institute.

[26] Ross, M. L. (2013). The Oil Curse: How Petroleum Wealth Shapes the Development of Nations. Princeton N. J. , Princeton University Press.
        See also Haber, S. and V. Menaldo (2011). "Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse." American Politcal Science Review 105(1): 1-26.

The validity of the estimates generated by our difference-in-difference estimator depends upon an identifying assumption: that the treated and untreated observations follow a common trend. Revisiting Figure 5, note that the institutional reforms cluster in the mid-to-late 1990s. By estimating equation (3) with a sample limited to pre-1990 data, we use this temporal clustering to search for common pre-treatment trends in TFP growth; doing so, we fail to detect any difference in trends prior to treatment.

Lastly, bias could also result were – as is suggested by Figure 10 -- the transition to electoral competition came as a result of prior declines in TFP growth.. We address this possibility by re-specifying our model to include 5 lags of the dependent variable and applying a System-GMM estimator to annual data. The results, presented in Appendix B, are consistent with our main results. [27]

iii. Analysis

We first estimate the relationship between the nature of Africa's political institutions and its total factor productivity (Table 5). We then explore the relationship between electoral competition and policy reform, first as measured by changes in the black market premium (Table 6) and then by regulatory reform (Table 7). Table 8 closes the argument by regressing productivity growth on both political reform and policy reform. To the extent that political reform affects productivity growth through its impact on policy reform, these final specifications will exhibit a reduced effect of political reform and a significant impact from policy reform.

In each table, the first specification (column one) includes only the treatment variable and time trend and uses the maximum number of available observations (when additional controls are excluded). Column 2 of each table repeats the initial specification, limiting the sample to the largest common sample available when all controls are included. This comparison tests one aspect of robustness. The remaining specifications (columns 3 – 6) progressively add to the list of covariates, first adding an indicator of civil war, then introducing a variable indicating that the country was participating in a program overseen by the IMF. Column 5 of each table then introduces controls for the shares of ores and metals, and fuel in merchandise exports along the dependency ratio, and column 6 (when the dependent variable is TFP growth) includes rainfall. In an effort to deal with endogeneity, we lag each independent variable (except rainfall) by one five year period.

In Table 5, we find that having a competitive electoral system in the previous five year period increases the rate of growth of TFP by approximately one percentage point.[28] There is evidence that the impact of reforms spills over national boundaries. In Tables 6 and 7, we explore the relationship between political reform and policy change. In Table 6, the dependent variable is our measure of changes in the black market premium. The relationship is negative in every estimate, suggesting that political reform was

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[27] Acemoglu, Naidu, Johnson, and Restrepo (2014) find a similar possibility in examining the effect of democracy on growth in a broader cross-section of countries. They, similarly, address this problem by incorporating multiple lags of their dependent variable in a System-GMM estimation.

[28] In tables 5 - 8, we begin the "maximal" sample (e.g., using all available observations for the most restricted of our specifications), and then re-estimate the initial specification (and all subsequent specifications) with the largest sample available for our least restricted specification.

followed by the reform of macro-economic policies.[29] Here, too, we find evidence that previous electoral competition in a given country's neighbors spills over to affect economic policy. Table 7 reports a positive relationship between institutional change and regulatory reform. After countries adopt competitive electoral systems, their governments begin to dismantle regulations and controls over key markets and industries, we find.[30]

Table 8 combines the treatment – political competition -- and mediating – policy -- variables into a single equation. Electoral competitiveness retains its positive significant effect on TFP growth across all specifications. Comparing the point estimates for electoral competitiveness for each specification in Tables 5 and 8 (e.g., respectively without and with the two mediating variables), suggests that approximately 30 percent of the impact of electoral competitiveness on TFP growth operates through policy channels.[31] The evidence for the black market premium, however, is merely suggestive as it retains its previous effect only with the maximal sample.

In closing, note Table 9, which indicates that political reform plays no role in driving the accumulation of physical capital per capita. It does, however, increase the accumulation of human capital, perhaps reflecting improved incentives for self-investment in education (columns 4-6). The effect on growth, however, is on the order of half the magnitude of the effect of political reform on growth as channeled changes in the rate of growth TFP.[32] We therefore have further justification for our focus on TFP growth as the critical driver of economic growth in contemporary Africa and the role of institutional change in contributing to it.[33]

VII. Conclusion

We too are cheered by Africa's recent economic resurgence, and in this article we have sought to account for it. In doing so, we have focused on the role of institutions. Throughout much of Africa, self-selected governments that gained power as a result of military coups or were installed by a party that could not legally be opposed have given way to governments that rule because they have received a majority of the votes in a competitive election. In addition, governments less frequently intervene in markets and economic incentives appear to elicit the more efficient use of land, labor, and capital in

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[29] In these estimates, the magnitude of the point estimates is sensitive to the sample of countries included, with a significantly smaller effect in the largest sample. Sign and significance, however, do not change across these samples.

[30] It is not clear, however, why previous electoral competition among the neighbors would negatively affect regulatory reform, as indicated in columns 3 – 5 of Table 7.

[31] That is, comparing like specifications between tables 5 and 8, the average reduction in the point estimates for electoral competition when policy and regulatory reform are included is just over 30%.

[32] Note that in our growth accounting framework, the growth contributions of an increase in human capital are multiplied by 0.55 – the production elasticity of human capital in the aggregate production function.

[33] As an additional check on the robustness of our difference-in-difference specifications, we also introduced country-specific time trends into the models in each of the preceding tables. Our core results remained unaffected; however the estimates for electoral competition in Table 7 lost statistical significance (raising questions about identification, but also perhaps an effect of reduced degrees of freedom). The results in Table 8 were unchanged for the larger sample, and the effect of electoral competition on human capital (Table 9) also lost significance. This final point underscores our focus on TFP growth.

Africa's economies. We have argued that the changes in the nature of Africa's polities produced changes in government policies, with the result that producers made more efficient us of labor and capital. While our analysis leaves much of the growth of Africa's economies unexplained, the relationship between the reform of institutions and the revival of growth emerges as one of our most robust findings.

If confirmed, our analysis is of obvious importance to policy makers, to humanitarians, and, above all, to those who live in Africa. Our findings are also significant to scholars, for they cut to the core of contemporary theorizing in the study of development. North (North 1990), Acemoglu and Robinson (Acemoglu and Robinson 2012), and others (Harriss, Hunter et al. 1995) argue that differences in institutions correlate with differences in economic performance, both historically and in the contemporary world, and that institutions that impose checks upon the power of political rulers reduce the level of risk. When institutions constrain those who govern, they then limit the use of power for purposes of predation. They provide a setting in which those who seek to prosper can remain secure and so encourage those with capital to invest and entrepreneurs to find ways to elicit more output from the inputs they possess. Insofar as we have identified a plausibly causal relationship between the changes in Africa's political institutions and the growth of total factor productivity, we have found evidence in support of these arguments.

We conclude by addressing a last question: How comprehensive and enduring does Africa's growth appear? By way of response, note the coefficients on the dependency ratio. While some, such as Young (2012), point to the "demographic dividend" that Africa might accrue as a result of an earlier decline in mortality rates, recent reports highlight the persistence of high birth rates and therefore the persistence of high dependency ratios.[34] Our results confirm the negative impact of such ratios on increases in per capita incomes. They also suggest (subject to the effect of possible measurement error) a positive impact of petroleum exports on Africa's growth rate; but with the slowing growth of emerging markets and the increase in the domestic production of energy in North America, the impact of such exports is likely to decline. Lastly, note the significant relationship between rainfall and growth in Africa's economies. That rainfall remains a significant determinant of economic growth reminds us of the continuing importance of the agricultural sector and that while Africa's economies may be growing, their structure has yet to be transformed.

Given the results of our analysis, moreover, it is particularly sobering to view our core finding in light of political trends in Africa. For several years, Freedom House has decried the decline in in the quality of political and civil rights on the continent. As stated in its report for 2010:

> 2009 marked the fourth consecutive year in which global freedom suffered a decline – the longest consecutive period of setbacks for freedom in the nearly 40-year history of the report. These declines were most pronounced in Sub-Saharan Africa.

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[34] Guengant, J.-P. and J. May (2013). "African Demography." Global Journal of Emerging Market Economic Economies **5**(3): 151-152.

As captured in Figure 13, according to Freedom House in 2012, a higher percentage of the states in Africa moved to lower levels and a lower percentage ascended to higher levels of political and civil liberties, compared to the world as a whole. Worth mentioning too is the data compiled by Daniel Posner, who has collected data on term limits in Africa. When competitive elections were introduced in the period of political reform, term limits were adopted in 33 African states. As of 2014, the limits had not been reached in 9 of these states; but in 11 of the remaining 24 states (46%), the chief executive and his supporters sought to abolish them; and in 8 (33%) they succeeded in doing so. Powerful forces are at play in Africa that seek to reverse the political reforms of the 1980s. If our analysis is correct, this political reversal could be economically costly.

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Growth Rates of Agricultural Value Added & Productivity
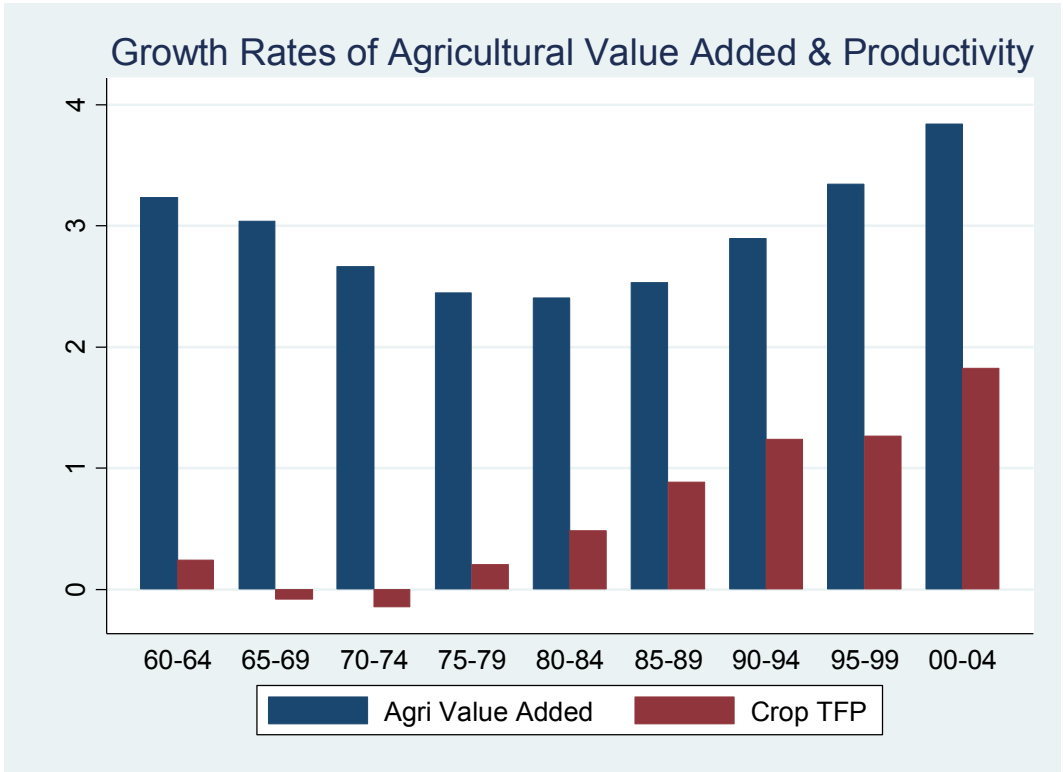
Figure 1

Source: Block (2014a)

Growth Rate of GDP

Real GDP

Real GDP per Worker

constant 2005 national prices
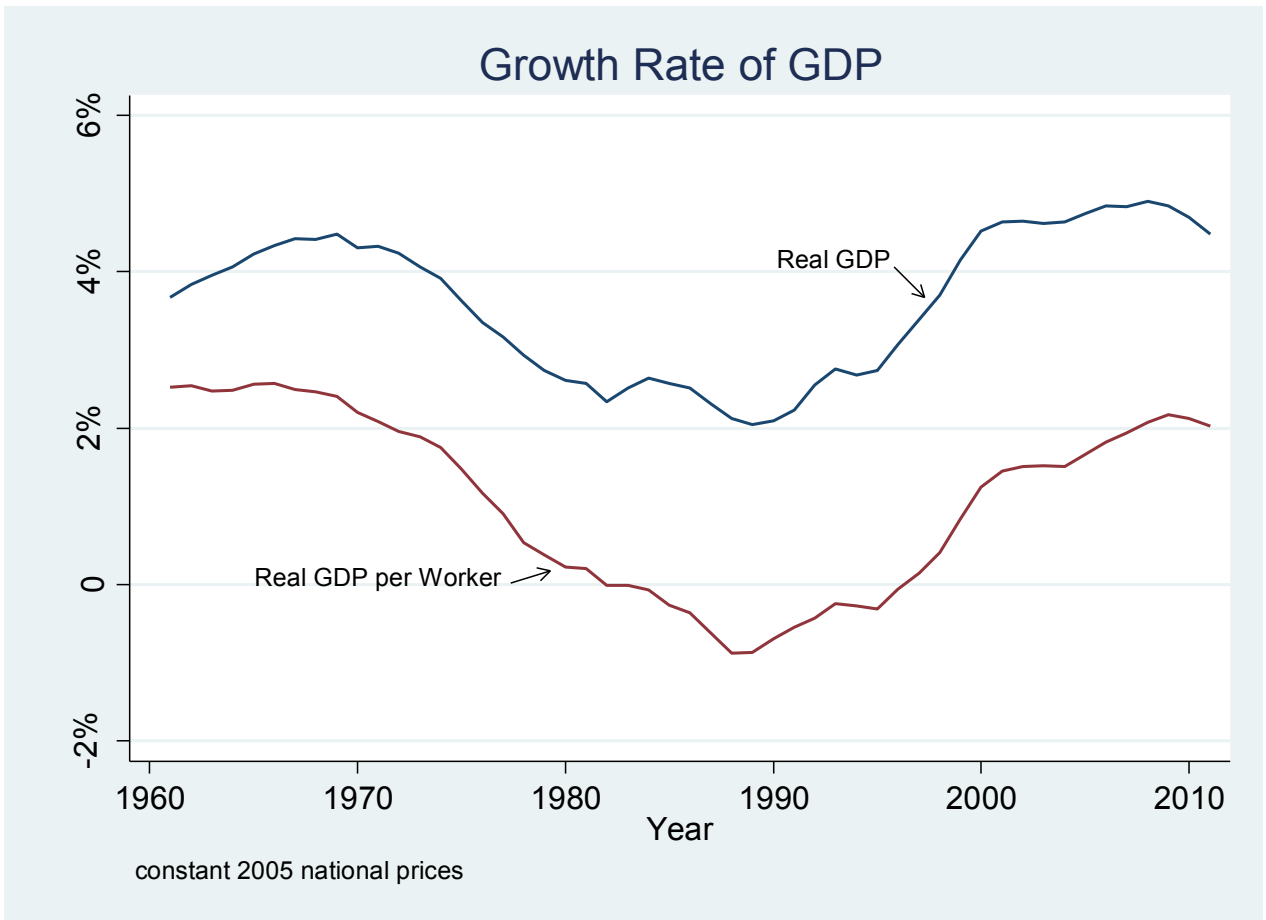
Figure 2

Source: Penn World Tables 8.0

Figure 3. Growth Decomposition by Decade
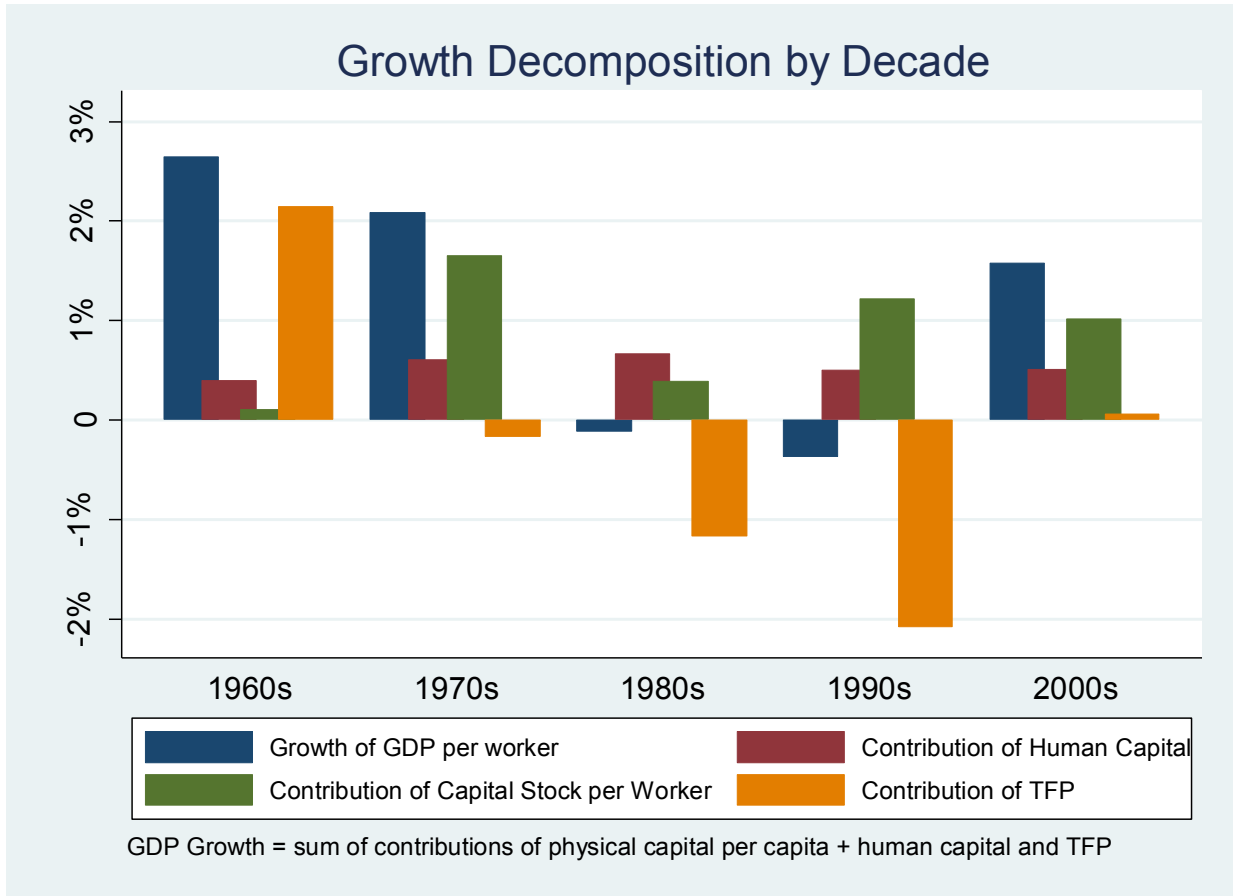
Source: Block (2014b) and UNECA (2014)

Figure 3

Political Institutions in Africa, 1970-1995

1 = No-Party System 2 = Single Party System 3 = Competitive Party System
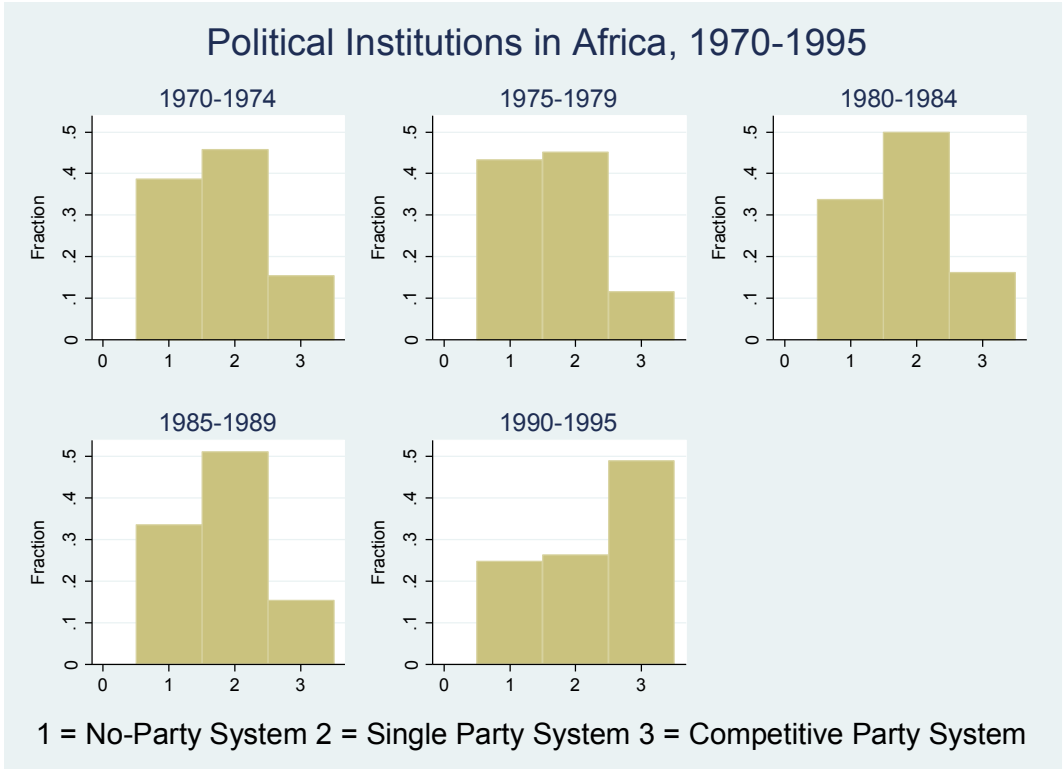
Source: Bates, R. (2008). Probing the Sources of Political Order. Order, Conflict and Violence. S. Kalyvas, I. Shapiro and T. Masoud. New York, Cambridge University Press, p. 30.

Figure 4

Average Political Competition by Year

Source: World Bank, Database of Political Institutions (Beck and Clarke, 2001)

Figure 5
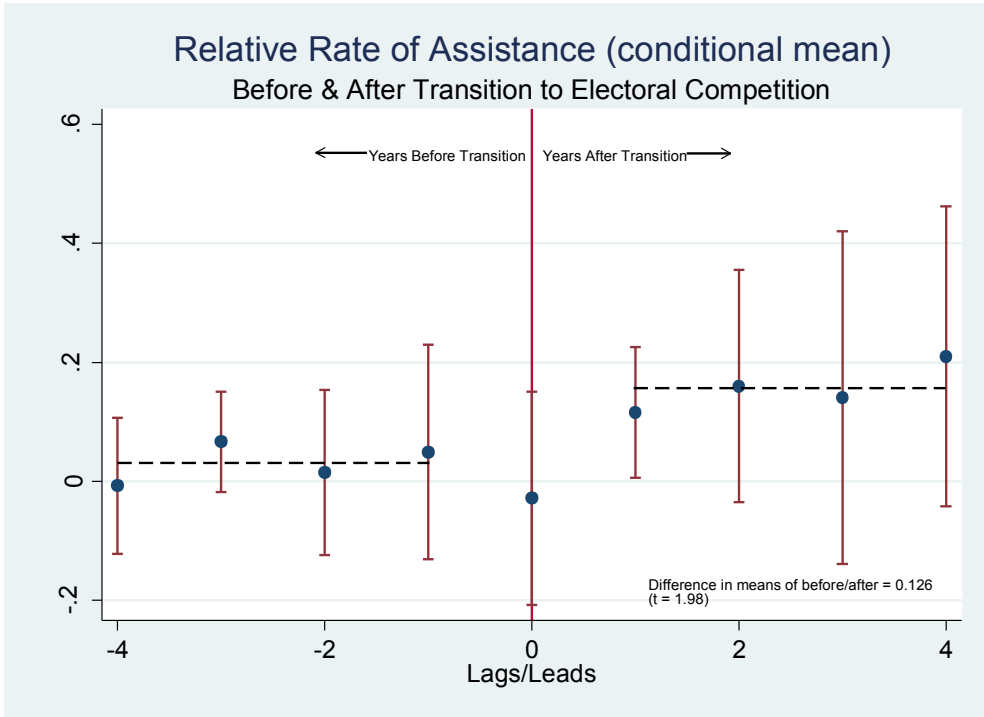
Figure 6: Panel A: Relative Rates of Assistance, Before and After Political Reform
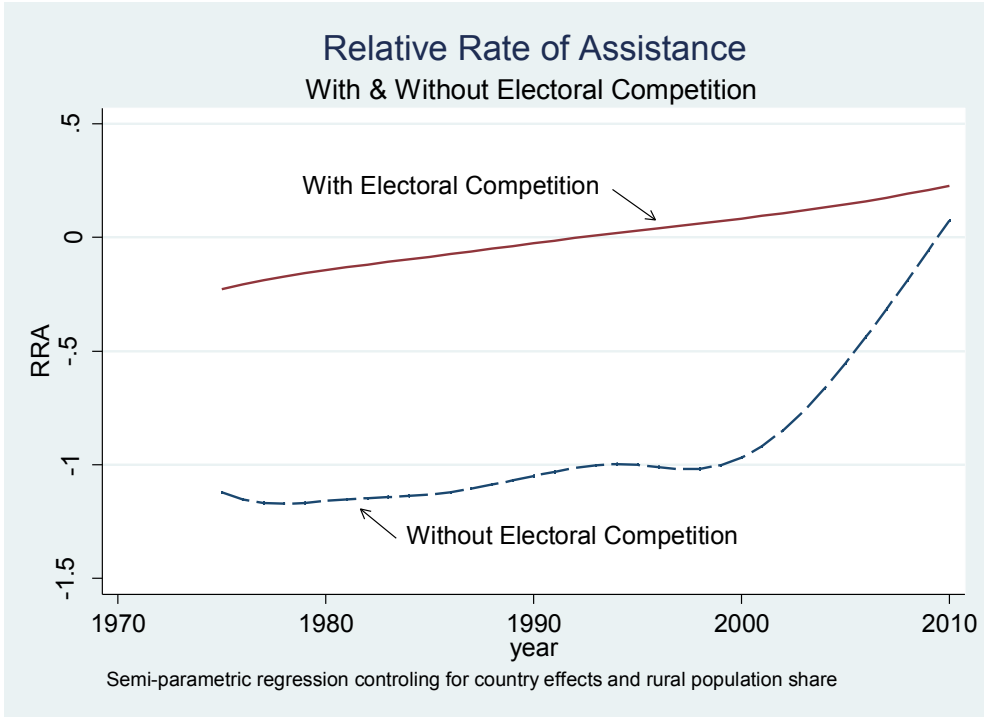
Figure 6, Panel B: Relative Rates of Assistance, With and Without Political Reform
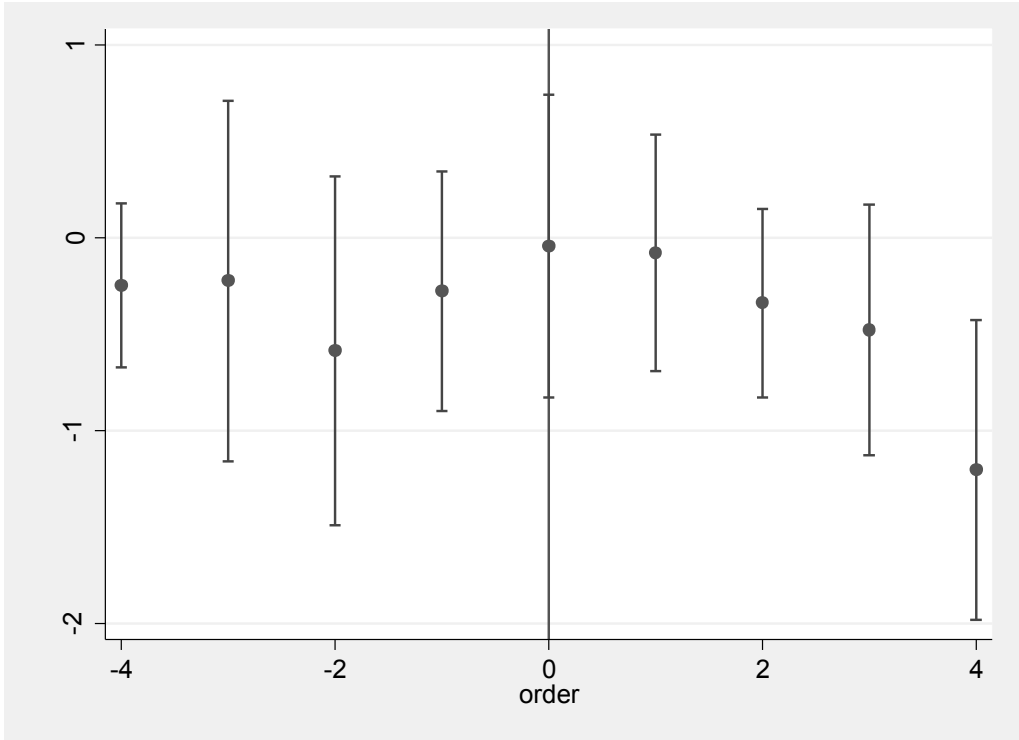
Figure 7: Panel A: Black Market Premium, Before and After Institutional Reform
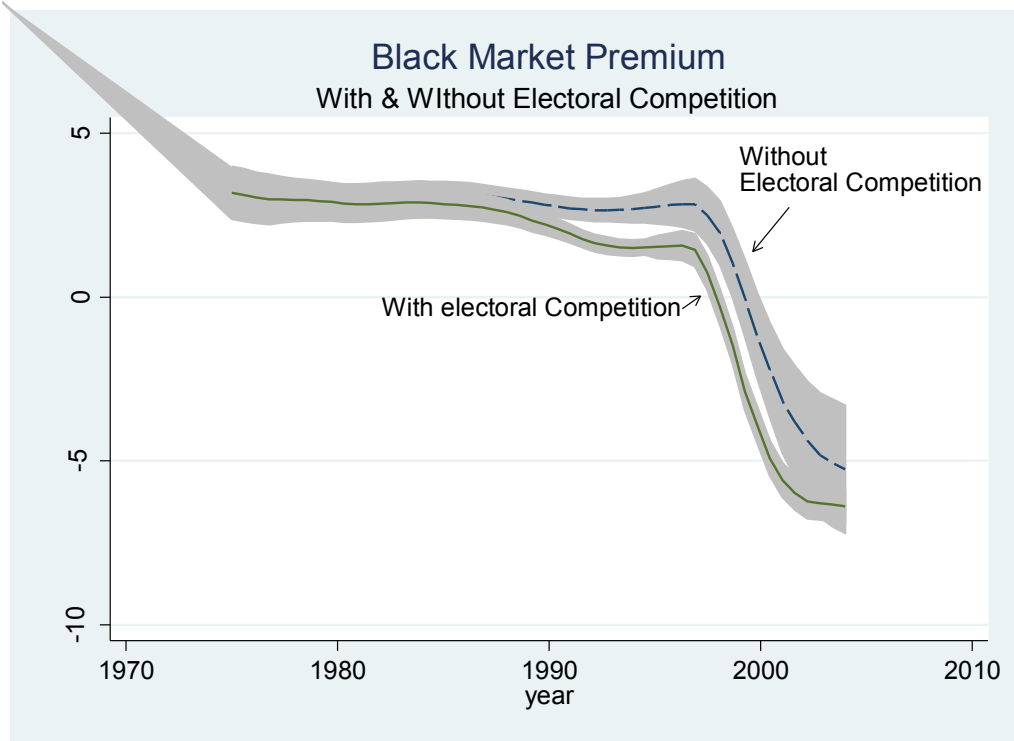
Figure 7: Panel B: Black Market Premium, With and Without Electoral Reform
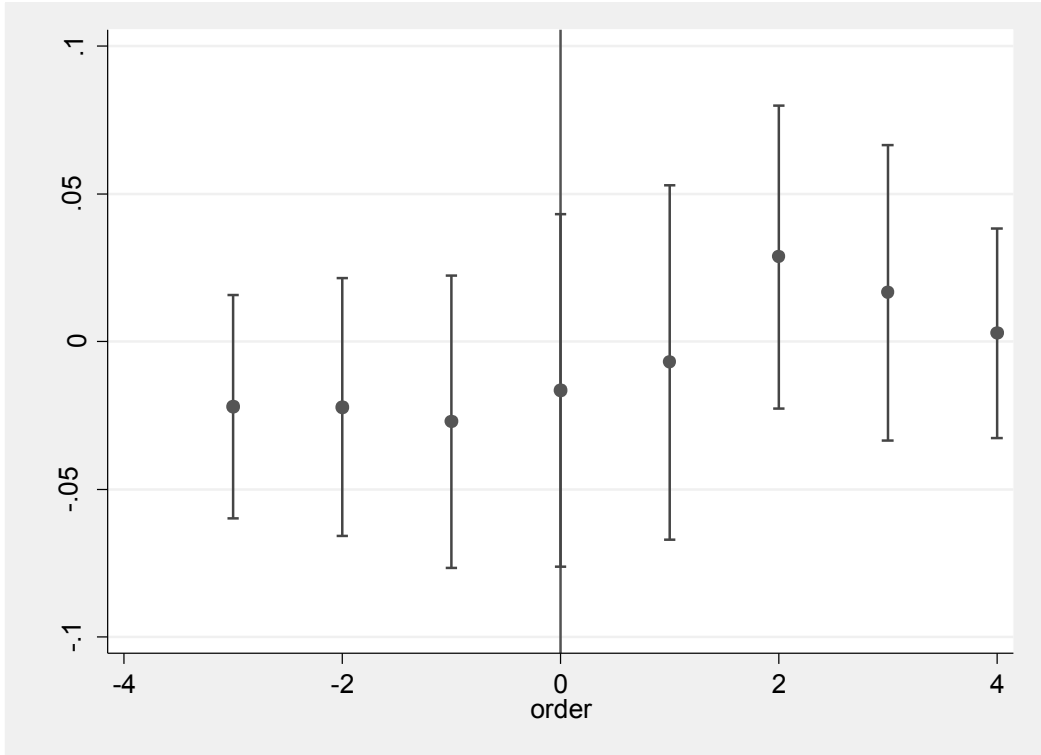
Figure 8: Panel A: Index of Government Intervention, Before and After Institutional Reform
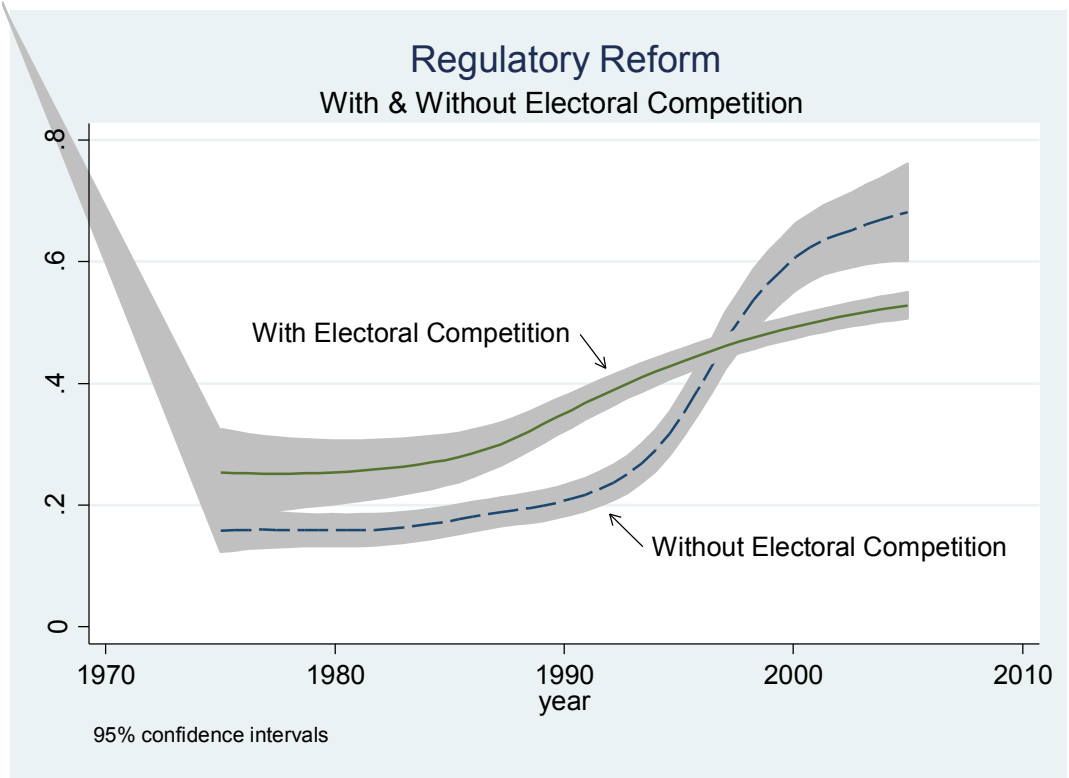
Figure 8: Panel B: Index of Government Intervention, With and Without Institutional Reform
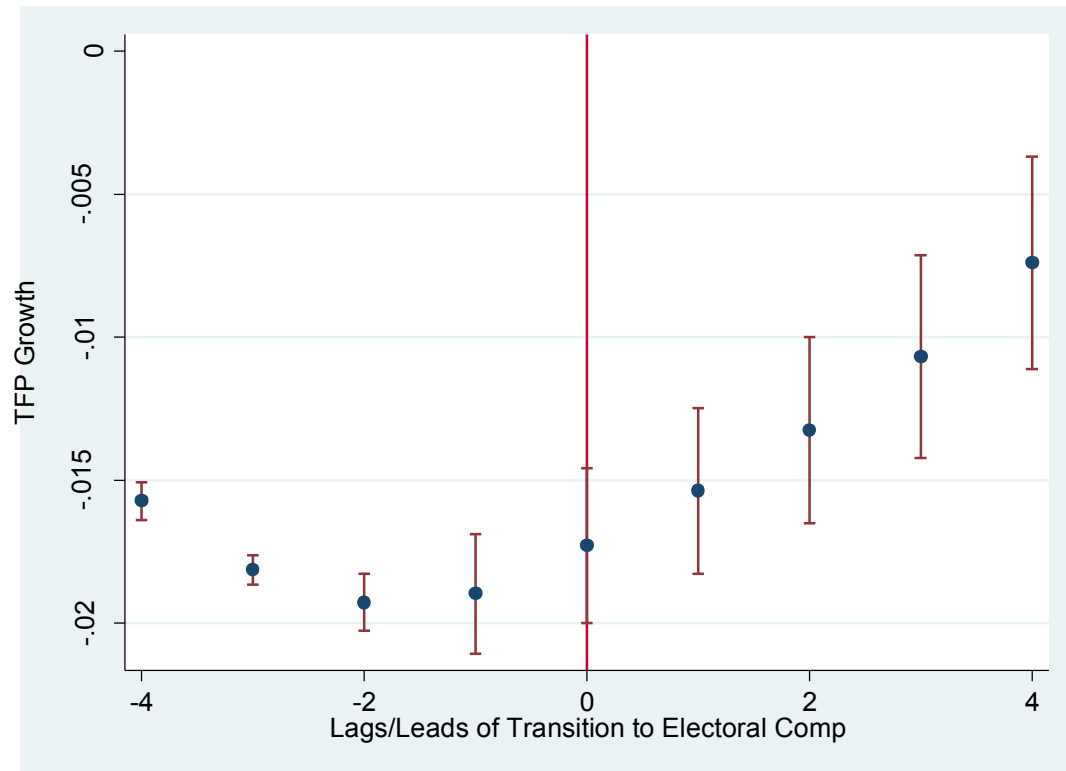
Figure 9. Economy-wide TFP Growth Before/After Transition to Electoral Competition
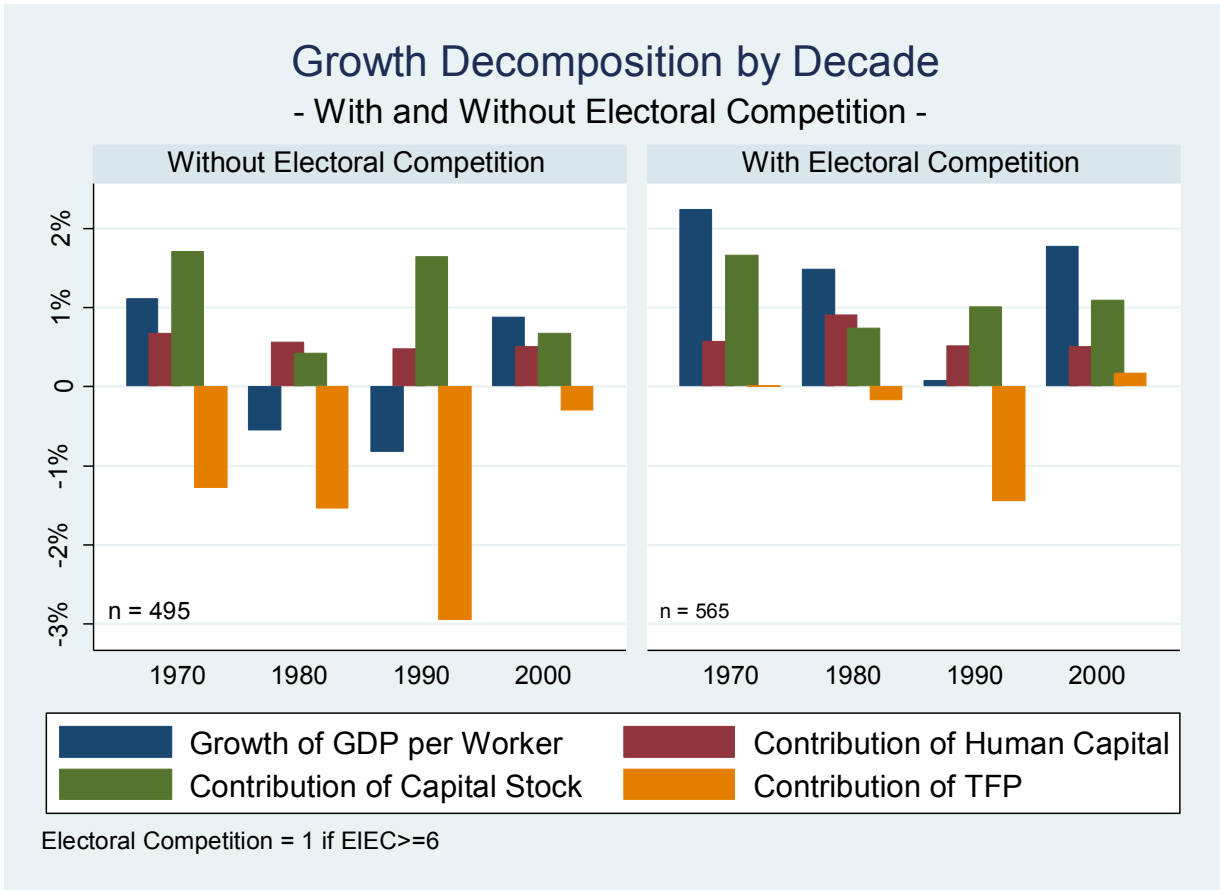
Figure 10. Sources of Growth, With/Without Electoral Competition
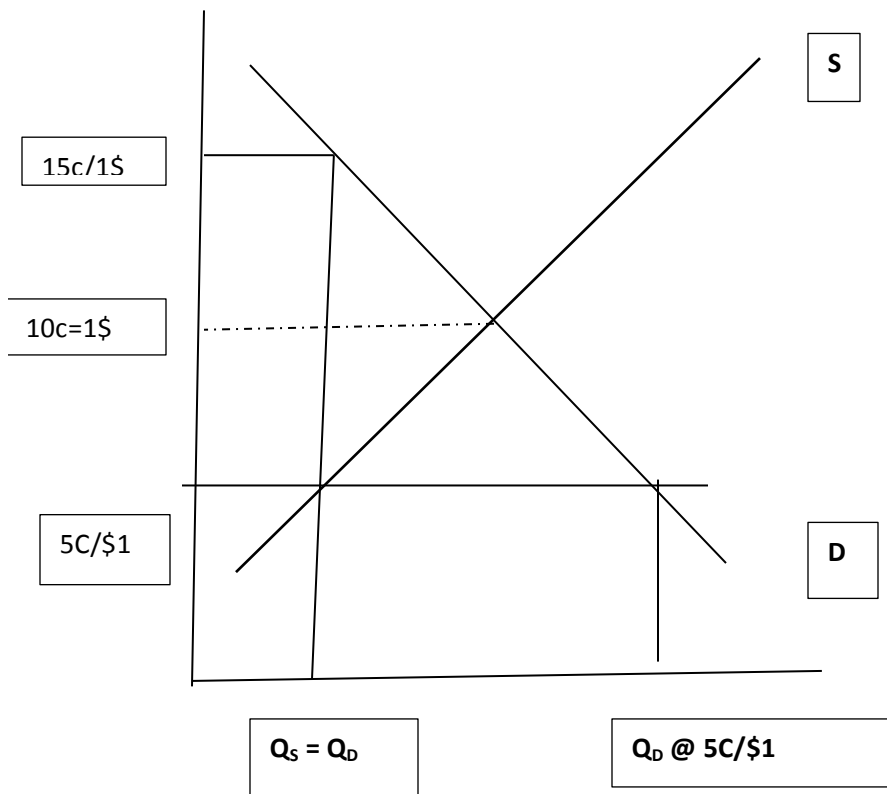
Figure 11: Government Intervention in the Market for Foreign Exchange

The chart contains the following labels:

- 15c/1$
- 10c=1$
- 5C/$1
- S
- D
- Q_S = Q_D
- Q_D @ 5C/$1
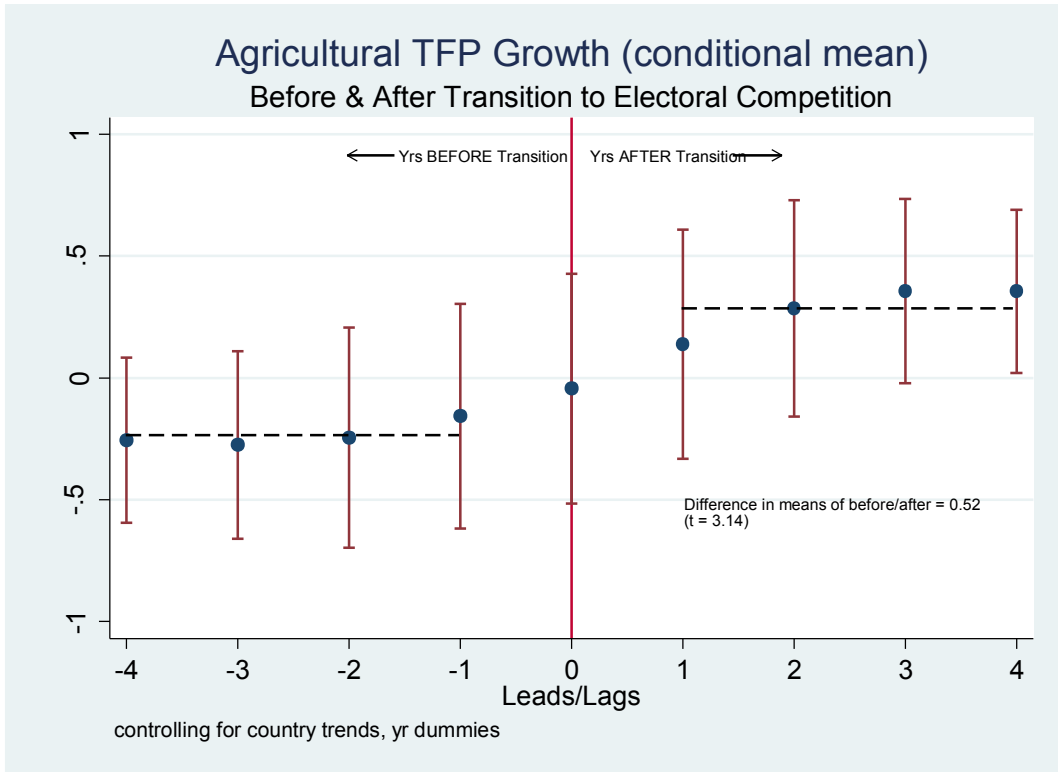
Figure 12. Crop TFP Growth Before/After Founding Election

Changes in Political Rights and Civil Liberties, 2012

(Percent of Nations Whose Scores Had Changed)
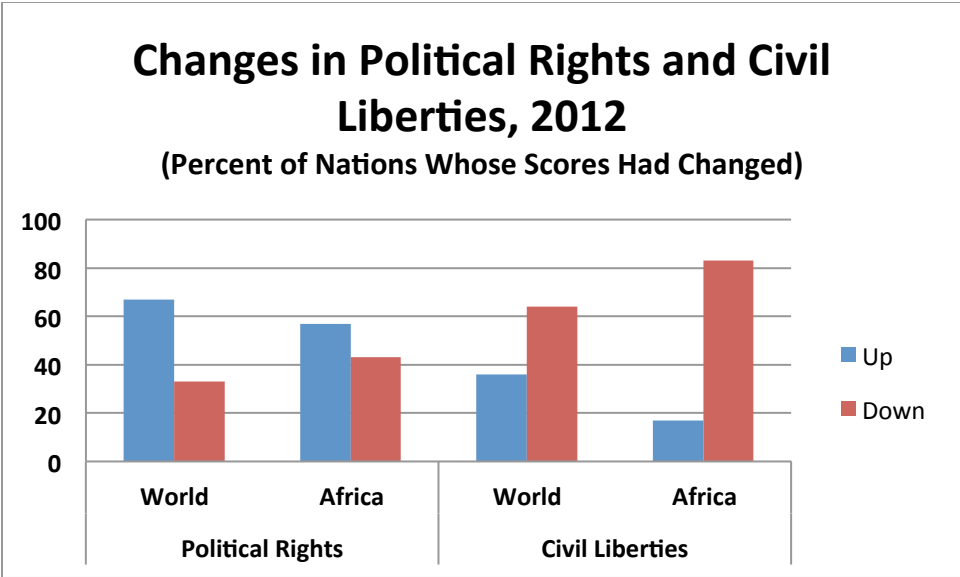
Figure 13: Changes in Political Rights and Civil Liberties, Africa and the World

Table 1. The Diffusion of Political Reform

Country	Date	Duration	Election		Outcome: Incumbent	
			Month	F&F?	Ousted	Retained
Benin	Feb-90	1 week	Feb-91	yes	√	
			Mar-96	yes	√	
Congo	Feb-91	3 months	Aug-92	yes	√	
Gabon	Mar-90	3 weeks	Dec-93	no		√
Mali	Jul-91	2 weeks	Apr-92	yes	√	
Niger	Jul-91	6 weeks	Feb-93	yes	√	
Burkina Faso	Aug-91	2 months	Dec-91	no		√
Ghana	Aug-91	7 months	Dec-92	yes		√
Togo	Aug-91	1 month	Aug-93	no		√
Zaire	Aug-91	1 year	--	--		
CAR	Oct-91	2 months	Aug-92	yes	√	
Chad	Jan-93	3 months	Jun-96	no		√

Source: Bates, R. H. (2008). When Things Fell Apart: State Failure in Late Century Africa. New York, Cambridge, p. 112.

Table 2. Effect of Electoral Competition on Agricultural TFP Growth

	(1)	(2)
ELECOMP67	0.585**	0.544**
	(0.226)	(0.210)
Rural Pop. Share		-0.0463
		(0.199)
Civil War dummy		-0.192
		(0.168)
Avg EIEC of neighbors (t-1)		0.203
		(0.127)
Constant	-48.62	48.13
	(32.08)	(265.3)
Observations	605	605
R-squared	0.668	0.679
Number of ctys	27	27
Country FE	YES	YES
Year FE	YES	YES
Country Trends	YES	YES

Robust standard errors (clustered at the country level) in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3. Effect of Electoral Competition on Relative Rate of Assistance, as a function of Rural Population Share

VARIABLES	(1) FE	(2) FE	(3) FE-2SLS	(4) FE-2SLS
ELECOMP67	-0.372*	-0.252	-0.501**	-0.233
	(0.182)	(0.257)	(0.230)	(0.243)
Elecomp x rurpopshr	0.00632**	0.00360	0.00690**	0.00300
	(0.00286)	(0.00344)	(0.00330)	(0.00332)
POLCOMP910				
polcomp910xrurpopshr				
Rural Pop. Share	-0.00265	0.00680	-0.00993	-0.00220
	(0.0101)	(0.0177)	(0.00758)	(0.0342)
Civil War dummy	-0.00268	0.0142	-0.0151	-0.0190
	(0.0531)	(0.0422)	(0.0378)	(0.0354)
Under IMF Agreement	0.121***	0.0501*	0.264*	0.143
	(0.0285)	(0.0273)	(0.156)	(0.190)
Constant	-0.0435	-25.57	0.611	-19.58
	(0.668)	(17.74)	(0.514)	(33.57)
Total Effect of Electoral Competition Evaluated with Rural Population Share at:				
25th percentile	0.014	-0.032	-0.080	-0.049
	(0.042)	(0.056)	(0.046)	(0.051)
50th percentile	0.067	-0.001	-0.021	-0.024
	(0.047)	(0.037)	(0.039)	(0.036)
75th percentile	0.137*	0.039	0.055	0.009
	(0.067)	(0.041)	(0.055)	(0.044)
Observations	432	432	279	279
R-squared	0.314	0.471		
Number of countries	15	15	15	15
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Country-Trends	NO	YES	NO	YES

Robust standard errors (clustered at country level) in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4. Mediation Analysis (Treatment = electoral competition; Mediating variable = RRA)

Dep. Var:	(1) Ag TFP gr	(2) RRA	(3) Ag TFP gr
ELECOMP67	2.401**	-0.438***	3.242***
	(1.107)	(0.158)	(1.084)
Elecomp x rurpopshr	-0.0132	0.00664***	-0.0259*
	(0.0151)	(0.00215)	(0.0148)
Relative Rate of Assistance			1.917***
			(0.439)
Rural Pop. Share	-0.0831**	-0.0176***	-0.0494
	(0.0350)	(0.00500)	(0.0346)
Civil War dummy	-0.127	-0.00116	-0.124
	(0.231)	(0.0329)	(0.222)
Constant	5.569**	0.914***	3.817*
	(2.322)	(0.331)	(2.274)
Observations	277	277	277
R-squared	0.218	0.382	0.277
Number of countries	11	11	11
	Evaluated with Rural Pop Share at:		
	25th pctl	50th pctl	75th pctl
Total Effect of Treatment	1.60***	1.49***	1.34***
	(0.293)	(0.246)	(0.278)
Direct Effect of Treatment	1.66***	1.44***	1.16***
	(0.283)	(0.238)	(0.027)
Mediation Effect	-0.065	0.044	0.185**
	(0.076)	(0.069)	(0.093)
Mediation Effect as Share of Total Effect	-4.0%	2.9%	13.8%

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1   Note: All specifications estimated by fixed effects and include a full set of year dummies. Robust standard errors calculated by bootstrapping (with 1000 repetitions).

Table 5. Difference-in-Difference Estimates of the Effect of Electoral Competition on TFP Growth (Panel of 5-year averages, 1960/64 – 2005/09)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TFP Growth Maximum sample	TFP Growth	TFP Growth	TFP Growth	TFP Growth	TFP Growth
				Largest common sample		
Electoral Comp (t-1)	0.00756***	0.0109***	0.0101***	0.0100***	0.0105***	0.0114***
	(0.00239)	(0.00275)	(0.00312)	(0.00347)	(0.00194)	(0.00130)
Neibrs Elect Comp (t-2)			0.00420*	0.00418*	0.00414**	0.00369**
			(0.00235)	(0.00240)	(0.00159)	(0.00160)
Civil War dummy (t-1)			-0.00135	-0.00135	0.00510	0.00524
			(0.00319)	(0.00323)	(0.00337)	(0.00329)
Under IMF dum (t-1)				0.000279	0.00501	0.00425
				(0.00330)	(0.00392)	(0.00374)
Trd Shr Ore/Metal (t-1)					-0.000108	-0.000102
					(0.000159)	(0.000154)
Trade Shr Fuels (t-1)					0.000273***	0.000255**
					(9.50e-05)	(8.97e-05)
Dependency ratio (t-1)					-0.386***	-0.367***
					(0.0865)	(0.0866)
Log Rainfall						0.00411
						(0.00662)
Time trend	0.00345***	0.00465***	0.00352***	0.00352***	-9.10e-05	2.65e-05
	(0.000435)	(0.00103)	(0.000646)	(0.000648)	(0.00113)	(0.00116)
Constant	-0.0409***	-0.0537***	-0.0590***	-0.0591***	0.149***	0.112
	(0.00224)	(0.00655)	(0.00756)	(0.00805)	(0.0476)	(0.0754)
Observations	189	53	53	53	53	53
R-squared	0.553	0.812	0.845	0.845	0.912	0.913
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	32	21	21	21	21	21

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6. Difference-in-Difference Estimates of the Effect of Electoral Competition on Black Market Premium (Panel of 5-year averages, 1960/64 – 2005/09)

VARIABLES	(1) Log BMP Maximum Sample	(2) Log BMP	(3) Log BMP	(4) Log BMP	(5) Log BMP
			Largest Common Sample		
Electoral Comp (t-1)	-3.135***	-6.034***	-5.622***	-5.752***	-5.886***
	(0.990)	(1.275)	(1.484)	(1.461)	(1.487)
Neibrs Elect Comp (t-2)			-2.270**	-2.307**	-2.378**
			(0.942)	(0.937)	(0.911)
Civil War dummy (t-1)			0.245	0.247	-0.346
			(1.742)	(1.692)	(1.492)
Under IMF dum (t-1)				0.608	0.145
				(0.877)	(0.989)
Trd Shr Ore/Metal (t-1)					-0.0407
					(0.0923)
Trade Shr Fuels (t-1)					-0.0159
					(0.0271)
Dependency ratio (t-1)					31.94
					(40.95)
Time trend	-1.591***	-1.311**	-0.693	-0.698	-0.395
	(0.197)	(0.498)	(0.424)	(0.418)	(0.403)
Constant	13.07***	12.26***	15.18***	14.97***	-1.242
	(1.081)	(3.265)	(3.795)	(3.772)	(23.23)
Observations	139	53	53	53	53
R-squared	0.643	0.812	0.871	0.872	0.875
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Number of countries	29	21	21	21	21

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 7. Difference-in-Difference Estimates of the Effect of Electoral Competition on Regulatory Reform (Panel of 5-year averages, 1960/64 – 2005/09)

VARIABLES	(1) Reform Index Maximum Sample	(2) Reform Index	(3) Reform Index	(4) Reform Index	(5) Reform Index
			Largest Common Sample		
Electoral Comp (t-1)	0.0751**	0.0428	0.0500**	0.0546***	0.0472**
	(0.0365)	(0.0250)	(0.0197)	(0.0167)	(0.0177)
Neibrs Elect Comp (t-2)			-0.0414**	-0.0401**	-0.0429**
			(0.0159)	(0.0157)	(0.0154)
Civil War dummy (t-1)			-0.00311	-0.00319	-0.0115
			(0.0276)	(0.0291)	(0.0458)
Under IMF dum (t-1)				-0.0215	-0.0424
				(0.0380)	(0.0507)
Trd Shr Ore/Metal (t-1)					-0.00278
					(0.00269)
Trade Shr Fuels (t-1)					0.00177*
					(0.000956)
Dependency ratio (t-1)					0.673
					(1.611)
Time trend	0.0756***	0.101***	0.112***	0.112***	0.121***
	(0.00911)	(0.00787)	(0.00845)	(0.00817)	(0.0198)
Constant	-0.222***	-0.405***	-0.351***	-0.343***	-0.680
	(0.0569)	(0.0582)	(0.0625)	(0.0623)	(0.923)
Observations	171	53	53	53	53
R-squared	0.764	0.885	0.901	0.902	0.909
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Number of countries	30	21	21	21	21

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8. Testing for the Significance of Policy Channels

	(1)	(2)	(3)	(4)	(5)
VARIABLES	TFP Growth	TFP Growth	TFP Growth	TFP Growth	TFP Growth
	Maximum Sample		Largest Common Sample		
Electoral Comp (t-1)	0.00583**	0.00610*	0.00637**	0.00784***	0.00947***
	(0.00267)	(0.00307)	(0.00292)	(0.00186)	(0.00184)
Log BMP (t-1)	-0.000661***	0.000253	0.000571	0.000490	0.000339
	(0.000173)	(0.000988)	(0.000786)	(0.000508)	(0.000541)
Reform Index (t-1)	0.0261***	0.0362***	0.0306*	0.0225*	0.0292**
	(0.00905)	(0.0121)	(0.0157)	(0.0121)	(0.0122)
Neibrs Elect Comp (t-2)			0.00309	0.00352**	0.00206
			(0.00230)	(0.00164)	(0.00183)
Civil War dummy (t-1)			-0.00200	0.00418	0.00431
			(0.00258)	(0.00321)	(0.00269)
Under IMF dum (t-1)			-0.000394	0.00385	0.00157
			(0.00273)	(0.00355)	(0.00310)
Trd Shr Ore/Metal (t-1)				-2.57e-05	2.43e-05
				(0.000201)	(0.000194)
Trade Shr Fuels (t-1)				0.000287**	0.000243***
				(0.000101)	(8.31e-05)
Dependency ratio (t-1)				-0.344***	-0.281***
				(0.0834)	(0.0772)
Log Rainfall					0.0105**
					(0.00462)
Time Trend	0.000667	0.00252***	0.00221***	-0.000579	-0.000532
	(0.000646)	(0.000800)	(0.000696)	(0.00141)	(0.00137)
Constant	-0.0270***	-0.0460***	-0.0529***	0.128***	0.0288
	(0.00346)	(0.00547)	(0.00775)	(0.0432)	(0.0555)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Number of countries	27	21	21	21	21
Observations	149	53	53	53	53
R-squared	0.672	0.849	0.866	0.922	0.928

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9. Effect of Electoral Competition on Accumulation of Physical & Human Capital (Panel of 5-year averages, 1960/64 – 2005/09)

VARIABLES	(1) Growth of Physical Capital per cap	(2) Growth of Physical Capital per cap	(3) Growth of Physical Capital per cap	(4) Growth of Human Capital per cap	(5) Growth of Human Capital per cap	(6) Growth of Human Capital per cap
Electoral Comp (t-1)	-0.00105	0.0264	0.0176	0.00396*	0.00735*	0.00933***
	(0.0168)	(0.0330)	(0.0402)	(0.00225)	(0.00358)	(0.00302)
Log BMP (t-1)			-0.00503			-0.00144*
			(0.0108)			(0.000727)
Reform Index (t-1)			0.0460			0.00997
			(0.151)			(0.0142)
Neibrs Elect Comp (t-2)			0.00274			-0.00259
			(0.0149)			(0.00194)
Civil War dum (t-1)			-0.0258			0.000643
			(0.0388)			(0.00253)
Under IMF dum (t-1)			-0.0726			-0.00508*
			(0.0523)			(0.00293)
Trd Shr Ore/Metal (t-1)			0.000648			0.000198
			(0.00249)			(0.000234)
Trd Shr Fuels (t-1)			-0.000215			-6.56e-05
			(0.000789)			(8.23e-05)
Dependency Ratio (t-1)			2.959**			0.324**
			(1.391)			(0.118)
Log Rainfall			-0.0206			0.0169*
			(0.0669)			(0.00894)
Time Trend	0.00344	-0.0107	0.0145	-0.00116**	-0.00322**	-0.00141
	(0.00331)	(0.0131)	(0.0101)	(0.000554)	(0.00139)	(0.00156)
Constant	-0.00117	0.0818	-1.359	0.0172***	0.0306***	-0.246**
	(0.0200)	(0.0857)	(1.060)	(0.00340)	(0.00919)	(0.111)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	189	53	53	189	53	53
R-squared	0.017	0.044	0.310	0.089	0.270	0.486
Number of countries	32	21	21	32	21	21

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix A: Data Definitions and Sources

Variable	Obs	Mean	Std. Dev.	Min	Max	Source
Electoral Competition dummy	245	0.473	0.500	0.000	1.000	=1 if EIEC≥6. Database of Political Institutions; Beck, Clarke et al (2001)
Neighbors' Avg. Electoral Competition	245	3.941	1.487	2.000	7.000	
Civil War dummy	245	0.159	0.367	0.000	1.000	Sambanis and Doyle (2006)
Under IMF Agreement	245	0.686	0.465	0.000	1.000	Vreeland
Ores/Metals Shr Merchandise Exports	245	17.554	25.345	0.000	98.302	World Development Indicators
Fuel Shr Merchandise Exports	245	10.173	18.910	0.000	94.389	World Development Indicators
Dependency Ratio	245	0.483	0.025	0.377	0.530	World Development Indicators
log Rainfall (annual)	245	6.906	0.399	5.407	7.883	Jefferson & O'Connell (2004)
TFP Growth	245	-0.015	0.006	-0.030	-0.003	calculated by authors
GDP Growth per Worker	245	-0.002	0.049	-0.159	0.172	calculated from Penn World Tables 8.0
Growth of capital stock per worker	245	0.011	0.066	-0.513	0.188	calculated from Penn World Tables 8.1
Growth of human capital per worker	245	0.011	0.007	-0.012	0.030	calculated from Penn World Tables 8.2
Agricultural Output	2130	976,517	244,7993	25.29	3.31x10	Block (2014a)
Agricultural TFP Growth Rate	1494	0.614	2.117	-7.694	8.247	Block (2014a)

Appendix B: System-GMM Estimates of Equation (3) incorporating multiple lags of dependent variable (TFP growth)

Table B1. Difference-in-Difference Estimates of Effect of Electoral Competition on TFP Growth (System-GMM estimator using annual observations)

VARIABLES	(1) TFP Growth	(2) TFP Growth	(3) TFP Growth	(4) TFP Growth	(5) TFP Growth
TFP Growth (t-1)	1.612***	1.268***	1.163***	1.211***	1.173***
	(0.0211)	(0.0471)	(0.0511)	(0.0501)	(0.0565)
TFP Growth (t-2)	-0.678***	-0.391***	-0.341***	-0.383***	-0.362***
	(0.0400)	(0.0777)	(0.0814)	(0.0807)	(0.0885)
TFP Growth (t-3)	0.199***	0.212**	0.303***	0.308***	0.349***
	(0.0424)	(0.0845)	(0.0875)	(0.0885)	(0.0986)
TFP Growth (t-4)	-0.416***	-0.245***	-0.484***	-0.485***	-0.517***
	(0.0400)	(0.0941)	(0.0980)	(0.0985)	(0.107)
TFP Growth (t-5)	0.246***	0.0532	0.232***	0.234***	0.234***
	(0.0207)	(0.0553)	(0.0602)	(0.0592)	(0.0640)
Electoral Comp[a] (t-1)	0.000455***	0.00174***	0.00130***	0.00121***	0.000930**
	(0.000143)	(0.000387)	(0.000415)	(0.000388)	(0.000423)
Under IMF[b] (t-1)				-0.000456*	-0.000490*
				(0.000252)	(0.000284)
Neibrs Elect Comp (t-2)			0.000743***	0.000654***	0.000530***
			(0.000161)	(0.000144)	(0.000166)
Civil War (t-1)			-0.000475	-0.000737*	-0.000710*
			(0.000469)	(0.000379)	(0.000417)
Ore/Metal Shr Mrch Expt (t-1)			-1.70e-05	-1.56e-05	-1.55e-05
			(1.54e-05)	(9.78e-06)	(1.09e-05)
Fuels Shr Mrch Expt (t-1)			-1.73e-05	-4.16e-06	4.73e-06
			(1.23e-05)	(8.89e-06)	(1.03e-05)
Dependency Ratio (t-1)			-0.0527***	-0.0282***	-0.0245**
			(0.0119)	(0.00885)	(0.00983)
Reform Index (t-1)					0.00394***
					(0.00131)
Log Black Mkt Prm (t-1)					2.71e-05
					(5.52e-05)
year	6.27e-05***	-5.79e-06	-0.000117***	-7.32e-05***	-9.26e-05***
	(4.94e-06)	(1.98e-05)	(2.68e-05)	(2.36e-05)	(3.43e-05)
Constant	-0.125***	0.00967	0.254***	0.156***	0.192***
	(0.00983)	(0.0393)	(0.0560)	(0.0487)	(0.0694)
Observations	1,135	248	248	248	248
Number of countries	32	25	25	25	25

Notes: [a] Treated as a predetermined variable; [b] Treated as an endogenous variable.