Dictators, Democrats, and Government Performance

In an African Country

Chapter 2

Government Performance: Theory and Evidence

INTRODUCTION

As de-colonization neared its end in the 1950's, a wave of optimism swept across sub-Sahara Africa. In the jewel of Britain's colonies in Africa, Nigerians anxiously embraced the promise of political sovereignty. Upon his inauguration as Governor-General, Nigeria's great nationalist Nnamdi Azikiwe recited a poem called "Youth." It begins, "We have tomorrow bright before us like a flame/Yesterday a night-gone thing a sun-down name." Langston Hughes, the African-American author of the poem, listened from the audience full of earnest Nigerians.[1] With massive commitments to education and socio-economic development from the new political class, the future looked bright. The country's growth rate reached 4.1 percent in 1962 and that figure more than doubled the following year.

The explanations for subsequent political and economic disappointments remain controversial. The expansion of oil in the economy surely matters, as does the persistence of military intervention in politics. Other explanations emphasize the politicization of ethnicity. This chapter sidesteps causal explanations and limits itself to an overview of Nigeria's empirical record of government performance. I demonstrate here that variation over time indeed exists, leaving the task of actually explaining the causes of variation for later. In the first section, I explain how the theory of public goods offers an effective tool for measuring government performance. It usefully helps us clarify the theoretical distinctions among policies based on the consumption of policy benefits. I also refer to studies on human capital formation, which show how the effects

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[1] "Zik Becomes His Excellency," *West Africa,* November 19, 1960, p. 1299.

of some policies are indirect. This presents a dilemma for policy makers who seek more immediate results for their own political gain.

In the second section, I claim that measures of performance should ideally illustrate the range of "publicness" revealed by public goods theory. Some nationally-oriented policies may be enjoyed by all citizens while other policies are more vulnerable to targeted implementation. With this goal in mind, I identify primary education, the courts, and fiscal discipline as three relevant areas of government performance. I create variables to measure policy outputs using operationalizations grounded in the political development literature. After summarizing major structural and policy shifts in these areas, I describe performance in each of these areas over time using data gathered during nearly a year of field research.

This chapter yields multiple measures of my dependent variable that enable me to explore different aspects of performance. By adopting some variables that closely resemble public goods and others that do not, I can compare results between different types of policy. Since I describe the variables' results in relative terms, I can also compare the level of performance over time. In addition, I capture two different dimensions of education: one pair of variables that reflects the level of the policy outputs, and another pair that estimates the efficiency of spending. I accomplish the latter by generating predicted observations, given spending levels, and comparing predicted to observed levels. Plotting the difference allows me to pinpoint periods of "good" performance versus years with under-provision of goods. I conclude by making generalizations about government performance between 1960 and 2003.

PERFORMANCE MEASURES IN COMPARATIVE PERSPECTIVE

In this section I define "public goods" and explain why the concept is helpful for understanding and measuring government performance. This leads me to explain why states often become involved in the provision of services in the first place. I describe how scholars operationalize the concept in order to measure government performance. This includes a treatment of government policy as an investment in human capital formation. I claim that an emphasis on aggregated variables is a common weakness of approaches to public goods. I then explain why and how I measure government performance using variables that capture a range of "publicness."

Theorizing and Measuring Public Goods

The theory of public goods describes why some policies broadly benefit the public while others serve narrower interests. It advances strong claims about the effects of group size on decision making. Due to the temptation to "free ride" on the contribution of others, it argues that large organizations can only resolve the problem of collective action through enforcement and select incentives (Olson 1965). It is properties of consumption that determine whether a good is public or not. The theory has important implications for the study of politics because states do provide many goods. As a consequence, public goods theory has thus emerged as one of the most important tools for evaluating government performance and understanding the distributional effects of politics (Shugart 1999, 53-88; Haggard and McCubbins 2001; Feng 2003).

In a theoretical "Walrasian" economy, where markets exist for everything, goods are rivalrous. This means that enjoyment by one consumer prevents another from enjoying that particular good. Non-rivalrous goods, such as clean air or public safety, are "public goods." Provision of the good does not impact the cost of consumption as the number of people benefiting from it changes. The classic example is a lighthouse since one ship seeing the light does not interfere with another doing so (Rosen 1995). The "public" nature of these goods stems from the absence of rivalry in their consumption, not the fact that they may be provided by the state or that their distribution may be the consequence of social organization. Public goods may also be "non-excludable," meaning it is too difficult or "costly" in principle to deny them to any citizen just because she has not helped pay for their provision. Table 1 illustrates the relationship between excludability, rivalry and different types of goods. Economists disagree about whether nonrivalry or non-excludability is the minimum definition for all public goods. However they do seem to agree that "pure" public goods meet *both* of these criteria, and that markets will undersupply non-excludable goods.

Table 1: Public and Private Goods

	Excludable	**Non-excludable**
Rival	Private goods	Common pool resources
Nonrival	Club goods	Pure public goods

From Przeworski (2003)

States supposedly provide goods and services in response to market failures, although this is only one of several possible reactions to such failures. Welfare economics describes a hypothetical world without market failures to demonstrate that a competitive equilibrium leads to the efficient allocation of goods in society. The first theorem of welfare economics states that this is possible in a Walrasian economy because no single individual can affect the prices paid by others. The second theorem shows that an egalitarian distribution is possible through a redistribution followed by decentralized exchange, as long as the reallocation of initial endowments is costless. The significance of these two theorems is that in a perfect market, information about prices is sufficient to generate an adjustment of production and exchange that leads to a Pareto optimal distribution (Przeworski 2003). In reality of course, such perfect markets do not exist (North 1990). Moreover when states become involved in providing certain goods and services, they often do so with a comparative advantage over the market (Lake and Baum 2001, 587-621).

Policy makers have self-interests such as ensuring their political survival or maximizing their influence. The provision of public goods improves when political incumbents either see the formulation of national-oriented policies in their self-interest or when institutions constrain such self-interest (Bueno de Mesquita and Root 2000; Geddes 1994). The literature uses different terminologies but the principles are similar: policies that serve people regardless of their relationship to the incumbent are "publicly regarded" or "national-oriented" because of their non-excludability. In contrast, policies that serve a narrow constituency (such as an interest group or a geographic region) are "private regarded," clientelistic or "pork." These distinctions effectively capture the range of excludability in policy outputs, which I refer to as "publicness."

Many studies blur these distinctions by operationalizing government performance with aggregate measures such as economic growth per capita or inflation. By focusing on macroeconomic outcomes that tend to meet the strict definition of public goods, these studies generally neglect other relevant measures of government performance that are more private-oriented. Using broad national measures or making assumptions about the non-excludability of certain goods does have advantages, particularly when engaging in cross-national research. But such highly aggregated variables may not offer much insight into the outcomes as actually experienced by individual citizens (Sen 1999). Addresses these shortcomings requires using measures that capture a range of publicness.

Social Investment as Human Capital

Studies that make assumptions about non-excludability by using aggregate measures risk ignoring differences with some goods which may actually be more private-regarded. For example, schools and teachers are geographically targetable. This means that unlike the lighthouse example they are excludable. Consumption of resources devoted to education may also be rivalrous because one region might gain teachers at the expense of another. (This rivalrousness might be acute if there are major distinctions between publicly and privately operated facilities.)

In other ways though, government investment in education does resemble a public good. As components of human capital formation, they have long term benefits conducive to economic growth. In this view, “A greater amount of educational attainment implies more skilled and productive workers, who in turn increase an economy’s output of goods and services” (Barro and Lee 2001, 541-63). Baum and Lake, for example, argue that investments in these sectors create significant indirect effects conducive to growth (Baum and Lake 2003, 333-47). However such indirect benefits of education present a time horizon issue. This is because incumbents (including dictators) want to claim credit for good policies. The benefits of the policies might not be immediately visible to their constituency – or even during their tenure. This resembles a classic collective action problem because policy makers face the temptation to free ride on the short term sacrifices made by others to generate the policy. In general, economic policies with properties of a public good contribute to collective action problems (Haggard 1997, 121-152).

The idea that human capital investments promote development challenged the conventional economic wisdom (Galbraith 1976). Classical liberal economists still argue about the impact of human capital on economic growth.[2] Among international development organizations there is now an emerging consensus that human capital investment does contribute to growth and development. The World Bank's Millennium Development Goals, the conclusions of the United Nations Development Program's Human Development Reports and other prominent documents in the international development community all broadly share this view.

Moreover, the value of investing in human capital is a guiding assumption in many of Nigeria's policy planning documents. For example, the National Development Plan for 1962 – 1968 stated that the "Education Programme is designed to increase as rapidly and as economically as possible the high level manpower which is indispensable to accelerated development." It committed the federal government to providing substantial assistance to the states for this purpose (Federal Ministry of Economic Development 1960). In 1977, a task force on education chaired by Chief Simeon Adebo laid out a National Policy on Education. Its White Paper declared that education was the

[2] For example, Helliwell finds weak support for the hypothesis that investment in human capital leads to growth (Helliwell 1994, 225-48). For a good literature review and critique of this work on the effects of education on growth, see Schultz (1999). He considers large impacts of education on growth implausible because wages and other measures don't change by comparable magnitudes. However, Feng finds strong support for Helliwell's hypothesis. He extends the argument to incorporate the effects of political instability, arguing that it has an adverse effect on school inputs and human capital formation (Feng 2003). Schultz's analysis of African education does conclude that educational investments have positive returns on growth. But his cases of Kenya, Tanzania, Côte d'Ivoir and Ghana suggest that investment at different levels has different effects. Some African education policies favor investment in higher education; this biases education policy in favor of the wealthy (Schultz 1999, 67-88).

"greatest investment that a nation can make for the development of its economic, political, sociological and human resources."[3] A number of Nigerian social scientists share this view as well (Aregbeyen 1996).

The discussion of human capital suggests that both the public and the more private-regarded policies contribute to development. In the remainder of this chapter, I examine the Nigerian government's performance in education, the courts, and "fiscal discipline." I adopt these measures because they capture the range of publicness I identified above. I operationalize each of these measures with variables drawn from the development literature and then summarize four decades of government performance.

MEASURING GOVERNMENT PERFORMANCE IN NIGERIA

My measures express three different dimensions of performance: First, by tracking the relative outputs of particularistic policies, I generalize about levels of policy delivery. Second, my measures capture the efficiency of spending on particularistic goods. This allows me to pinpoint when the government spent an excess of money relative to the policy output purchased. Third, they reflect a range of publicness by incorporating some variables that meet the strict definition of public goods as well as other, more particularistic policies. Together, these dimensions make it possible later to compare the delivery of different types of policies.

I measure the first two dimensions of government performance with two distinct pairs of education variables. The first pair captures education performance levels, which I operationalize in terms of primary student/teacher ratios as well as the number of

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[3] *West Africa* editorial, "Hard Road for Education," May 21, 1979, p. 871. Similarly, the Ministry of Health wrote that "the health of the people not only contributes to better quality lives but is also essential for the sustained economic and social development of the country as a whole" (Federal Ministry of Health 1996).

schools. An appendix to this chapter explores the controversy between student/teacher ratio and student performance. I offer some evidence to support scholars who claim that education inputs do contribute to better overall education outcomes. The second pair of variables measures performance by considering the relative relationship between policy inputs and outputs. I construct a model that uses federal spending on education to predict outputs. I then use the regression's residuals to identify periods of good government performance based on years when government inputs were equal to or less than government outputs.

To study the third dimension of government performance I examine fiscal discipline and judicial efficiency. I operationalize fiscal discipline as budget surplus measured as a share of Gross Domestic Product; negative figures indicate a deficit. Budget deficits are directly related to observable and measurable spending policies. This approach is consistent with operationalizations adopted by other studies that examine the relationship between political processes and economic outcomes. I measure judicial efficiency through case clearance rates. The clearance statistics are drawn from an original sample of over 500 property rights-related cases collected during field research. These types of cases are especially appropriate because of the widely studied causal relationship between a government's ability to enforce individual property rights and economic development. This section explores each of these three dimensions of performance in turn.

Education and Schools

The research on government performance reviewed so far suggests that education impacts economic growth, whether through human capital formation or in other more direct ways. Enrollment rates and averages years of schooling are the most widely used measures of education policy in the developing world (Glewwe and Kremer 2005). The World Bank and other experts on education criticize these metrics because they inadequately capture education's contributions to building human capital. Instead, factors such as class size, measured as student/teacher ratio, better measure education. Not only do they have demonstrable effects on economic growth over the long term, they are also linked to more immediate outcomes associated with better quality education (Barro and Lee 2001, 541-63; Lee and Barro 2001, 465-88). This is not necessarily the case with years of schooling as a measure, which has a more ambiguous relationship to student performance. Recent studies of student/teacher ratios in Africa also conclude that classroom size impacts educational outcomes (Case and Deaton 1999, 1047-88). The variables measuring education I adopt here are all policy outputs, as distinct from educational outcomes, such as literacy rates or standardized test scores. I explore the issue of whether policy outputs can be linked to policy outcomes briefly in Appendix 1 to this chapter.

This sub-section proceeds in three steps. First, I provide an overview of how Nigeria historically implemented education policy. This summary makes clear, for what it is worth, that the government repeatedly pledges its devotion to education. I pay particularly close attention to the role of private actors and subnational governments, since their role in education could arguably reduce the validity of my operationalizations. Second, I illustrate education policy outputs in a series of charts. To measure delivery levels, I create a variable for the primary student/teacher ratio. I also examine overall construction of schools since this will allow me to offer some basic generalizations about school infrastructure even if we lack a reliable quantitative metric for its inconsistent quality. Third, I generate a second pair of education variables using federal spending on education to predict policy outputs. These variables capture policy efficiency. I then briefly summarize the periods with less or more efficient policy implementation.

An Education Policy Overview

Even before independence in 1960, Nigeria's governments regularly accorded education top priority. In 1959, the Federal Minister of Education appointed a commission to study educational planning for the first decade of Nigeria's independence. In 1961, the Federal Government pledged to implement key recommendations of the Ashby Commission, as it became known, including "progressive improvement in primary education throughout the Federation so that the foundation of national development may truly be laid." The federal government declared that its multi-year development plans would "accord the highest priority to education." With an eye towards anticipated manpower needs for 1970, the Commission set targets for all educational levels (Federal Government of Nigeria 1961). Policy makers knew that a post-colonial Nigeria would need to train a new generation of bureaucrats, politicians, and entrepreneurs.

Up until 1970, primary and secondary education was largely in the hands of private voluntary organizations that were financially supported by the federal government. Vast disparities in the conditions between public and private schools prompted the federal government to set up the Asabia Commission in 1967. The government swiftly adopted the Commission's main recommendation that the states take over all private schools and schools run by private voluntary organizations. Over the next several years, the federal military government proceeded to abolish various state and local institutions such as the State Advisory Board of Education, the Local Education Authorities, and the Teachers' Council, which enforced discipline (Akinkugbe 1994). This had the effect of increasing the federal government's role in education.

A constant in the federal government's involvement in education since 1976 has been the Universal Basic Education (UBE), the government's principal program for primary education. In 1977, a task force on education chaired by Chief Simeon Adebo laid out a National Policy on Education. Its White Paper declared that education was the most important investment Nigeria could make for its socio-economic development.[4] Then in 1979 the new constitution guaranteed free primary and secondary education as a basic right. Two years later, the democratic government's National Policy on Education called education "a huge Government venture" that is "an instrument par excellence for effecting national development" (Federal Government of Nigeria 1981).

At first the federal government assumed all the fiscal responsibilities for UBE but in 1977 it requested the states' assistance. With the erosion of their tax base under military regimes, the states were in a weak position to assist but by 1981 the federal government had withdrawn from its funding obligations. Strapped for cash because of declining transfers from the federal government, the states in turn made the local government areas (LGA's) responsible for funding most of primary education. This led to various management crises in education during the 1980s when teachers went unpaid and unions complained loudly about work conditions.

Subsequent governments remained formally committed to basic education. In 1988 the federal government established the National Primary Education Commission

[4] *West Africa* editorial, "Hard Road for Education," May 21, 1979, p. 871.

(NPEC) to help share the cost of teachers' salaries. The NPEC was abolished in 1991 and then re-established in 1993, along with State Primary Education Boards (Akinkugbe 1994). Nigeria signed the "Jomtiem Declaration of Education for All" in 1990, an international agreement committing nine developing nations to reducing illiteracy, and maintaining various government programs to promote and fund education. UBE has remained a cornerstone, at least nominally, of all the governments since it began, including the democratic government that came to power in 1999. Bold constitutional provisions again enshrined the commitment to UBE.[5]

A concern with using education as a measure of performance is that the federal government's role in its provision varies over time. This is true particularly in Africa, where missionaries and private institutions played such a large role in education (Abernethy 1969). Nevertheless I believe federal spending provides a sufficient measure for four reasons: First, as Baum and Lake point out, even if the government is not a direct provider of such services it still regulates them and has an interest in ensuring that policy results "fall within politically acceptable limits" (Baum and Lake 2003, 333-47). When the state does actually provide such services, it typically does so with a comparative advantage over the market (Lake and Baum 2001, 587-621). Second, the federal government gives these policies high priority as part of its national development strategies; I have already cited numerous references to such policy statements. Third, in reality the Nigerian federal government provides extensive financial assistance to the states for carrying out their responsibilities in education. Fourth, I incorporate a control

[5] Section 18(3) of the 1999 Federal Constitution pledges the government to provide free compulsory Universal Primary Education, free secondary education, free university education, and free adult literacy programs. See also (Federal Ministry of Education 99; Universal Basic Education Programme 2003).

variable for education as a share of federal spending, which to some extent proxies for the federal government's varying involvement in education.

In addition, tests performed in Appendix 1 to this chapter provide some preliminary evidence to support the assumption that the federal government has an impact on education. Subnational governments routinely refuse to implement national policies until they receive money from the federal government, either from grants in aid or through the revenue allocation system. One economist calls such behavior by the states a "complete negation of the very principles of federalism." The states "merely fold their hands and do not lift a finger till they have obtained their chunk of the so-called national cake."[6] This is important for our purposes since it reinforces the view that even where states have jurisdiction over implementation, this autonomy means little when the central government still controls the purse.

Performance Levels in Education

Figure 1 displays the actual, observed student/teacher ratios in primary schools.[7] It shows that in 1961 the student/teacher ratio stood at 29.3 students for each teacher in primary schools. Until 1965, the student/teacher ratio changed only slightly. The ratio

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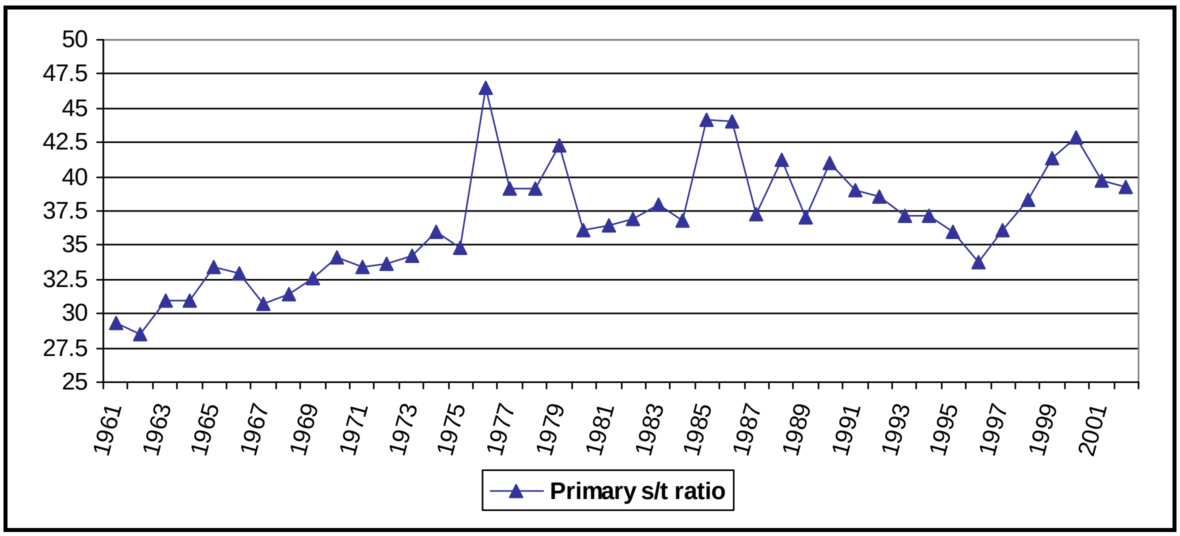
[6] Cover story, "Through the Eye of a Needle: States' Billion Naira Budgets Based on Expectation from the Federal Government," *The Nigerian Economist*, February 5, 1990, pp. 21-23. A similar drama played out in 2000 when the states refused to implement a minimum wage increase unless the federal government increased their share of money from the country's national revenue allocation formula.

[7] Sources for student/teacher ratios, enrollment levels, and number of schools are as follows: Years 1960-1962 from *Annual Digest of Education Statistics 1962*; years 1963 – 1967 from *Annual Abstract of Statistics 1968*, pp. 151-53; years 1991 – 2002 from *Handbook of Information on Basic Education 2003*. Other years are gathered from: *Annual Abstract of Statistics* for years 1972, 1981, 1982, 1985, 1986, 1991 and 2001; and editions of *Statistics of Education in Nigeria* for 1972, 1973/74, 1980-84, and 1985-1989. The sources for education expenditures are as follows: Years 1961 – 1964/65 are from the *Annual Abstract of Statistics 1968*, p. 126; years 1965-1969 are from the *Annual Abstract of Statistics 1972*, p. 124-5; years 1970 – 1979 are from the *Annual Abstract of Statistics 1981*, p. 145, which cites the Central Bank of Nigeria as its source; and years 1980 – 2002 are from the Central Bank of Nigeria, *Statistical Bulletin* Vol. 13, Part B, December 31, 2003. It should be noted that these sources report spending by function for budget estimates only. It was not possible to construct a complete time-series using actual spending (outlays) by function.

then grew to 33.4 students per teaching, following two years of teacher salary increases. A strike in 1965 partly affected the supply of teachers. They appealed to the Federal Government to form a Joint Negotiating Council to harmonize salary and benefits (National Joint Negotiating Council for Teachers 1965). The ratio stood at about 1965 levels through the early 1970s (using averages of nearest years for the Civil War from 1967 to 1969). In 1976 the ratio reached 46.5 students for each primary school teacher. Although it fell from this peak, the ratio remained high for the rest of the decade.

Figure 1: Primary Student/Teacher Ratio, 1961-2002



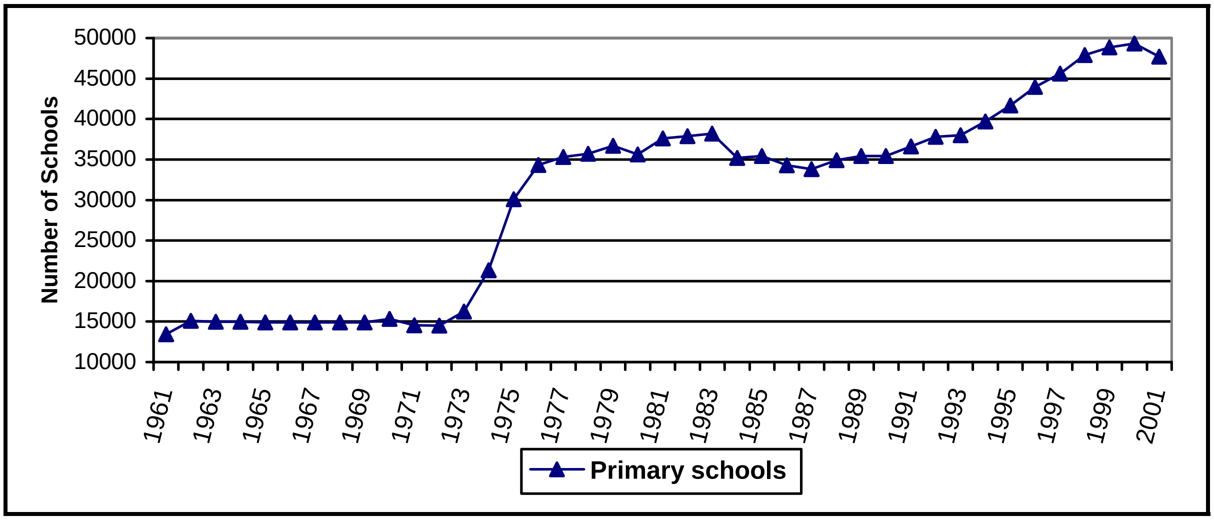
The ratios reported for the 1970s might surprise readers familiar with the period, since the federal government spent so much money on education. The influential Commission led by Chief Simon Adebo called the education system a "cumbrous patchwork" at the primary and secondary levels. It proposed complete government control for planning, financing and running of the schools.[8] The Supreme Military

[8] Editorial, "Adebo and Education," *West Africa*, November 26, 1971, p. 1379.

Council responded by issuing a decree in 1972 giving the federal government increased authority over education and giving it supremacy in the instance of a contradiction with state or local law. These new policies led to a purge of teachers and a serious decline in morale (Taiwo 1982). This period also coincides with the introduction of the federal government's ambitious Universal Basic Education program in 1976. Enrollments surged because education became virtually free. When the Civil War concluded in January 1970, primary enrollment stood at about 32 percent of the school age population but by 1978, primary enrollment was at least at 86 percent (Federal Office of Statistics 1979). Even so, it is likely that these are conservative figures. The government faced the huge task of teacher recruitment to keep pace with the new enrollment levels. Thus it is not entirely surprising that Figure 1 shows an increase in primary school student/teacher ratio in the 1980s, with a slightly more dramatic increase around 1985. This is followed by improvement between 1990 and 1997, and minor improvements in 2001 and 2002.

Figure 2 shows the number of primary schools recorded by the federal government for each year (I utilize averages of the nearest years for the Civil War years, 1967 – 1969). Since it reports the absolute number of schools reported by the states to the federal government, it is little surprise that the figure generally increases over time. What is perhaps remarkable is the steep increase starting in the mid-1970s. The slump in the late 1980s and the slight downturn after 2000 are also notable. Appendix 2 reports that with a lead $t+1$, the variable is stationary after de-trending.

Figure 2: Primary Schools, 1961 – 2001*



*Variable shown here without de-trending or lead

Education Policy Efficiency

Nigerian policy makers have grappled for decades with a supposed tradeoff between resources for education and the desired policy results. School reformers in the 1960s often said "more is worse," implying that expansion of educational opportunities should not outpace the capacity to supply education. To maintain capacity, various governments sought to ensure quality of education through a federal inspection process. It is unfortunately difficult to assess their impact because I know of no study evaluating the impact of education inputs on policy outputs in terms of more than a handful of years.[9]

Partly to fill this gap, I examine how education spending impacts student/teacher ratios and school infrastructure at the primary level. I compare these results with those

[9] See for example Abolade (1999) who discusses the joint UNESCO, UNICEF, and Federal Ministry of Education survey, "Monitoring of Learning and Achievement" (Abolade, J. O. 99). Gboyega *et al.* examine school infrastructure, furniture for teachers and students, and include a list of 13 states with over 1000 primary schools that have no school building (Gboyega, Ogunsanya and others 1998).

predicted by federal spending trends. I then identify the years when education was under-provided or adequately provided, given the model's general predictions. The difference between the predicted outputs $\hat{y}_i$, compared to the observed value ($\mu_i + \hat{y}_i$) is captured by the residuals in a linear regression. This allows me to identify periods of good government performance based on those years when government inputs were equal to or less than government outputs. These years can be contrasted with years when inputs exceeded the predicted outputs such that:

Equation 1: "Good" performance: $\mu_i \geq 0$

Equation 2**:** Under-provision of goods/services: $\mu_i < 0$

Figure 4 displays the residuals for the predicted number of primary schools. Figure 3 displays the residuals for the predicted primary student/teacher ratios. Because a lower student/teacher ratio is a sign of better performance, it is important to note that the definitions in Equation 1 and Equation 2 need to be reversed. In other words, $\mu_i \geq 0$ is a sign of under-provision of goods when interpreting the residuals in the model predicting student/teacher ratios.

The predicted student/teacher ratio is calculated based on total federal spending on education for a given year. All education spending is expressed in constant 2000 naira.[10] While the gross enrollment rate would be a useful control variable for this time

[10] Most of the spending figures for the 1960's are reported in fiscal years, which I converted to calendar years by multiplying the previous year by 0.25 and the current year by 0.75, since the fiscal year ends on March 31. The spending figures for 1969 are based on an average of 1968 and 1970. All years are then expressed in constant 2000 naira, calculated from the International Monetary Fund's International Financial Indicators Consumer Price Index. I would like to thank Nora Gordon and Craig McIntosh from the

series, such data are only available for about 20 years (many of which are non-consecutive). Total enrollments are one alternative option, and these data are available for all years. But using enrollments as a control would naturally introduce multicollinarity because I use those figures to calculate the student/teacher ratio. Such controls are essential where time-series variables are not stationary. Unit root tests performed on the student/teacher ratio show statistically significant evidence of stationarity at the two lower test levels. As test results in Appendix 2 show, education spending suffers from a unit root even though it is deflated. I therefore de-trend the education spending variable *ed.all* with first difference tests. I also introduce a control, *ed.budget*, which measures education spending as a share of the federal budget. This helps control for the federal government's varying financial contribution. Where the dependent variable, *Pri.s.t.*, is the student/teacher ratio:

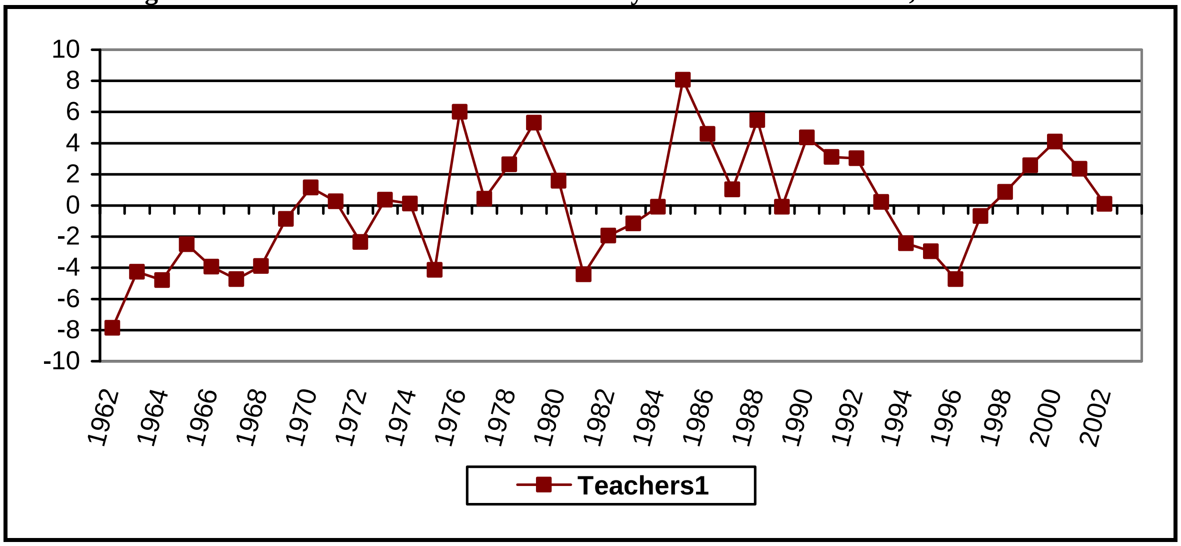
Equation 3: $\hat{Y}_t = \beta 0 + \beta 1\ (\Delta \text{ed.all}_t) + \beta 2\ (\text{ed.budget}_t) + \mu_t$

Figure 3 plots the residuals for the model as the variable *Teachers1*. The Adjusted R^2 is .191 and the model is significant at the .01 level. The Durbin-Watson statistic of .968 signals no negative autocorrelation (within .01 significance points). The full test results are reported in Appendix 3. But there is some positive autocorrelation (meaning that the error terms are somewhat close to one another), so the results should not be treated as definitive. The model shows that the most efficient performance occurs in the 1960s generally, a brief period in the mid-1990s, and to some extent in the early

University of California, San Diego, and Ademola Ariyo from the University of Ibadan for their advice on the conversions.

1980s. The most wasteful spending on education occurs in the late 1970s, and late 1980s into the early 1990s. Spending is also wasteful between 1999 and 2001.

Figure 3: Residuals for the Predicted Primary Student/Teacher Ratio, 1962-2002



For my other measure of policy efficiency in education, I incorporate a measure of school infrastructure inputs. The *Schools1* variable captures the impact of federal education spending, *ed.all*, on the total number of primary schools. I utilize a lead of one year based on the assumption that it takes about a year to build a school, so the effects of construction will not be observable until the following year.[11] Since the number of schools typically increases over the previous year, this variable might present problems for time-series analysis. Tests in Appendix 2 report that the variable is not stationary, meaning that it will introduce autocorrelation problems over time. I de-trend it with first difference tests where $\Delta y_t = y_t - y_{t-1}$. To further control for time I introduce gross enrollment levels. Since Appendix 2 shows that this variable is not stationary either, I

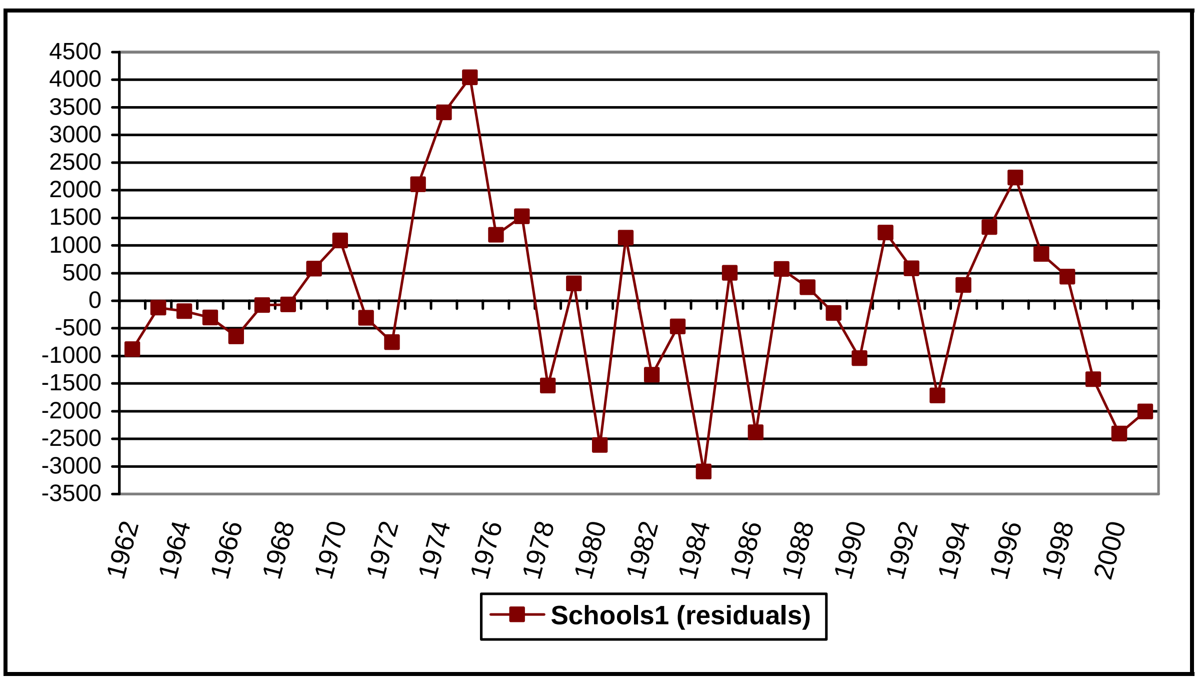
[11] Tests for a partial auto-correlation coefficient strongly suggest that *t*+1 accurately captures the lead time to build a school, showing that more than 90 percent of the value at time *t* is determined by the value at time *t -1*.

de-trend it with first difference tests, creating *Δpri.enroll*. For education spending I use the amount of federal spending on education, after deflation and de-trending. De-trending and introducing leads (or lags) are common techniques for reducing the autocorrelation in time series data (Enders 2004). Again I introduce *ed.budget* to reduce autocorrelation and control for the federal government's varying involvement in education. Where ŷ = the de-trended variable for primary schools at t+1 after de-trending (Pri.sch, lead $+1_t$ – Pri.sch, lead$+1_{t-1}$):

Equation 4: $\hat{Y} = \beta_0 + \beta 1\ (\Delta \text{ed.all}_t) + \beta 2\ (\Delta \text{Pri.enroll}_t) + \beta 3\ (\text{ed.budget}_t) + \mu_t$

This model is significant at the .01 level and the Adjusted R^2 is .288. The Durbin-Watson statistic is 1.338, indicating that neither positive nor negative autocorrelation exists. The results are reported in Appendix 3. I express the residuals of this model as *Schools1*. Tests in Appendix 2 show that this new variable is stationary.

Figure 4: Residuals for Education Spending Predicting Number of Schools, 1962 – 2001 (lead +1)



The small negative residuals in Figure 4 for the early 1960s mean that the number of primary schools was only slightly below the predicted number. The number of schools drops off again in 1966. The figure improves for the remainder of the decade; once again nearest-year averages are used for missing values during the Civil War years (1967 – 1969). 1971 shows a return to low levels, with the number of schools until 1973 lower than predicted. From 1973 to 1977 the number is higher than expected. The 1980s are full of seemingly stochastic ups and downs. 1994 to 1998 show notably higher than predicted number of schools but this situation is reversed in 1999.

Judicial Performance

Like all of my measures of government performance, the courts have a demonstrable relationship to economic development. Yet they have important differences compared to education policy outputs. Measuring judicial performance also presents a new set of challenges. In this sub-section I refer to literature which claims that courts contribute to economic development by protecting property rights. I then describe various techniques to measure court performance and explain why I choose to focus on efficiency in particular. Next, I provide a very brief overview of the Nigerian judicial system and explain how I operationalize efficiency in terms of case clearance rates. I utilize an original data set of property rights-related cases. Since my data only extend through 1987, I construct an alternative clearance variable using a separate but correlated measure of court performance. This parallel data set allows me to use predicted values to extend the data through 2003. I conclude with a discussion of the overall findings.

Numerous studies claim that dispute resolution and enforcement of property rights provide the foundations for long term economic growth (Alston, Eggertsson and others

1996; Pistor and Wellons 1999; Barzel 1997; Clague, Keefer and others 1997, 91-120; Olson 1993, 567-77). Another reason to include the courts is that compared to education, overall judicial performance closely resembles a nationally-oriented policy. To some degree, resources can be allocated by increasing the salary of judges or changing the number of judges. But even these changes do not necessarily introduce rivalry. This means that the judicial system essentially operates like a public good because everyone benefits from dispute resolution which would otherwise be costly for one person to provide (North and Thomas 1973).

Scholars utilize a variety of metrics to gauge judicial performance including judge caseload, the number of disposed cases, the average time it takes to resolve a case, and the clearance rate (Buscaglia, Edgardo 1999). These differ from other measurements that potentially impact judicial performance such as the independence of the courts or the perceived "fairness" of decisions.[12] (These other measures can become particularly important during authoritarian regimes. Chapter 3 will use additional qualitative and quantitative evidence to pinpoint when reduced judicial independence might interfere with an objective interpretation of clearance rates.)

To measure the courts' efficiency resolving property-related cases, I focus on clearance rates. Dakolias describes clearance as a good overall measure of dispute

[12] The Nigerian courts have dealt with both the issue of a reasonable time for a trial as well as what constitutes a fair hearing. The Supreme Court set the standard in 1968 when the Chief Justice of Nigeria wrote that "the true test of a fair hearing…is the impression of a reasonable person who was present at the trial, whether, from his observation, justice has been done in the case." The 1979 Constitution in Section 33(1) declared that "a person shall be entitled to a fair hearing within a reasonable time by a Court or other tribunal established by law and constituted in such manner as to secure its independence and impartiality." The Court clarified its interpretation of Section 33's expectations of reasonable time and fairness, which "must mean a trial conducted according to all the legal rules formulated to ensure that justice is done to the parties of the case. Reasonable time must mean the period of time which, in the search for justice, does not wear out the parties and their witnesses and which is required to ensure that justice is not only done but appears reasonable to persons to be done" (Craig, Justice E. B. 88).

resolution productivity. Other studies point out how judicial delay, which is manifest in a low clearance rate, increases the cost of private transactions. If few alternative dispute resolutions are available this hinders economic development (Buscaglia, Edgardo 1999). Consistent with these studies, I calculate *clearance* from the number of cases disposed divided by the number of cases received in a given year. This variable is generally an effective indicator of the future efficiency of the courts (Dakolias 1999; Buscaglia and Ulen 1997, 275-91).

Nigeria's legal system has gone through many changes since independence. The courts at the lowest level of the hierarchy (the State Customary Courts and the State Magistrate/District Courts, Customary/Area Courts) are not explicitly recognized in the federal constitutions. States have the discretion to determine whether they want to establish these local courts, although as of 1992 all states had established Magistrate/District Courts. The decisions of these lower courts are usually recognized by the state courts though, so this should not give the impression that they are not integrated into the legal system. At the state level, all states have a High Court, which is established as a *Superior Court* of record. Beyond that, states have discretion over whether they want to establish Shari'a Courts, which give the parties in the dispute the option of having their case judged by Islamic Law. By 1992 five states had also established official Customary Courts of Appeal. At the federal level, the Supreme Court has been operational since 1956, and in 1963 its decisions became the last word on legal issues in Nigeria as cases could no longer be referred to the Queen of England's Privy Council. A Federal Revenue Court was established in 1973, and the democratic constitution of 1979 christened it the Federal High Court. The Federal Court of Appeal was established by a military decree issued in 1976 (Fawehinmi 1992).

The sample used to calculate clearance rate is composed of 518 cases either decided in or appealed from the Federal High Courts to the Courts of Appeal and the Supreme Court between 1960 and the late 1990s. (There are about eight divisions for the Court of Appeal.) The total sample is composed of land disputes (449 cases) and "companies" cases (69 cases). Both of these legal categories involve protection of property rights. The issues covered by companies cases includes actions against companies, government regulation or inspection, corporate personality, tax assessment, and certain aspects of the bankruptcy and asset liquidation processes. [13] Most of the land cases concern disputes over title to land and were governed by English law of real property, which Nigeria inherited "hook, line and sinker" at independence, in the opinion of one legal expert (Oluyede 1985, 94-123). The issues covered by land and property related cases in my sample include property title, conveyance, compensation for property

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[13] A complete list of issues covered by companies cases in Nigeria includes: (1) action against a company; (2) enforcement of an act of a company's agent. For example, if a director or manager acts on behalf of the company, that person is taken to be the legal instrument of that company; (3) inspection of the affairs of a company. This includes investigations by Customs Department, National Agency for Food and Drug Administration and Control, and the Ministry of Commerce and Trades to ensure compliance with the relevant regulations; (4) winding up, liquidation and appointment of receivers and managers; (5) legal effect of articles of association; (6) change of name; (7) debenture and floating charges. Debenture is a form of borrowing by the company from the public through the capital markets. When a company goes bankrupt, payment of the debenture stockholders takes priority; (8) transfer of companies; (9) striking of a company's name from the register of companies; (10) compulsory liquidation, such as being compelled into bankruptcy, usually by the government. For example this might occur if a company has been posting false figures. This happened with the failed banks in the late 1980s and early 1990s; (11) corporate personality; (12) appointment of directors; (13) declaration, payment and conversion of dividend; (14) nature and legal personality of a foreign company. This involves the standing of a foreign company under Nigerian Law; (15) tax assessment, such as capital gains tax, income tax; (16) insolvency and bankruptcy; (17) incorporation and pre-incorporation contract, allotment, ownership, transfer and registration of shares. Pre-incorporation contract involves contractual agreement entered into by promoters of the company in the name of the company that is being promoted. In law, such a contract is not binding on the company except where the company ratifies the action of the promoters. (Orojo 1992; Tonwe 1997; Agbadu-Fishim 1998).

confiscated by the government, and disputes over communal land use. The cases in my sample also include customary tenancy, which occurs when a person occupies land on the basis of permission of the owner under customary law. Customary land law flows from the legal principle of "inalienability." In one celebrated decision, the Judicial Committee of the Privy Council noted that "the notion of individual ownership is quite foreign to native ideas. Land belongs to the community, the village or the family, never to the individual." These ideas, in place for hundreds of years, varied from state to state, especially between north and south. The Land Use Act of 1978 attempted to reconcile these different traditions by transferring all ownership of land (either jointly owned or individually owned) to the governor of that state to be held in trust for the indigenes of the state (op cit.). Under this landmark Act, instituted by a military government but still in effect, the sale of land requires the approval of the governor before the transaction is legally binding.[14]

[14] A more complete list of issues covered under land cases includes: (1) abandonment; (2) acquisition and claim for compensation over compulsory acquisition of land by government (this is very different from forfeiture in American law); (3) possession, adverse possession and recovery of possession of land and property. Possession covers physical control over land or property as distinguished from ownership, which concerns title. Adverse possession involves being in physical control of land or property against the rights of the legal title holder. This for example would include landlord-tenant relations; (4) assignment of property. This refers to conveyance of property not involving monetary value with the understanding that the assignee is the person who has been granted use of the property for certain reasons within a stipulated period of time. An example would be allowing someone to use a parcel of land for growing his/her crops but not granting them any rights to title; (5) breach of covenant. This usually occurs under customary law and is not always established by contract. It is an agreement not backed by law but recognized as binding by the parties entering into it; (6) claim for specific performance of sale of land and property. This usually occurs when the seller of property does not transfer ownership to the buyer in the agreed upon condition; (7) dispute over communal land takes place where a member of a community is exercising a right over a land held in joint ownership. This exercise is inconsistent with the general interest of the community and may be governed by the Land Use Act of 1978; (8) dispute over validity of certificate of occupancy and purchase; (9) conveyance of land or other property; (10) dispute of customary land and tenancy. Customary tenancy is when a person occupies a land not as the owner but based upon the permission of the owner under customary law. Often the occupation involves payment of some gratification or tithes to the owner. It can cover many years as long as the occupant continues to pay the tithes. The most famous example is the Modakeke-Ife dispute, where the Modakeke people migrated from Oyo and became customary tenants of the Ife people under an agreement that they will be paying farm produce to the Ife

Law reports offer the most reliable information about decisions. These reports are usually privately published and the information therefore does not strictly include *all* of the cases that reached these courts. This is one potential cause of measurement error. To address this problem, I cross-checked my list with a more complete indexes of cases: Olaitain's *Index to Law Reports 1880 – 1990*. This exercise suggests that while such distortions are unavoidable, differences in the number of cases are fairly minimal (Olaitan 1998).[15] A second possible cause of error could arise from the figures used to calculate the clearance rate. The actual number of cases filed in a given year is likely higher because the law reports only report cases after they are decided; they do not necessarily list all of the new cases filed in a given year. For this reason, I calculate clearance rate only through 1987, when the information about new cases drops off.[16] Omitted variable bias is obviously a third possible source of error when measuring a phenomenon as complex as judicial efficiency. Fortunately, clearance conveniently measures performance in relative terms from one year to the next, since it reflects a proportion. This further reduces the risks of such measurement errors. Finally, if certain types of cases in my sample take longer to resolve, on average, this would skew my

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overlords; (11) action for declaration of title to land; (12) trespass and injunction; (13) equitable interest in land refers to when joint owners have equal rights to land or property. They might disagree on development, sale or lease; (14) family property, forfeiture,[14] gift of land; (15) joint tenancy; (16) pledge of land falls under customary law when the owner allows an occupant to exercise possessory rights over the land with the understanding that the owner has granted mere use of the land. This can also involve pledging land as a collateral in a loan transaction; (17) registration of land instrument, title, conveyance of land. Under the Land Use Act, this might refer to irregularities in the process of conveyance or registering ownership of land; (18) statutory and customary right of occupancy. (Elias 1971; Olawoye 1974; Oluyede ; Aluko 1998; Olkany 1986).

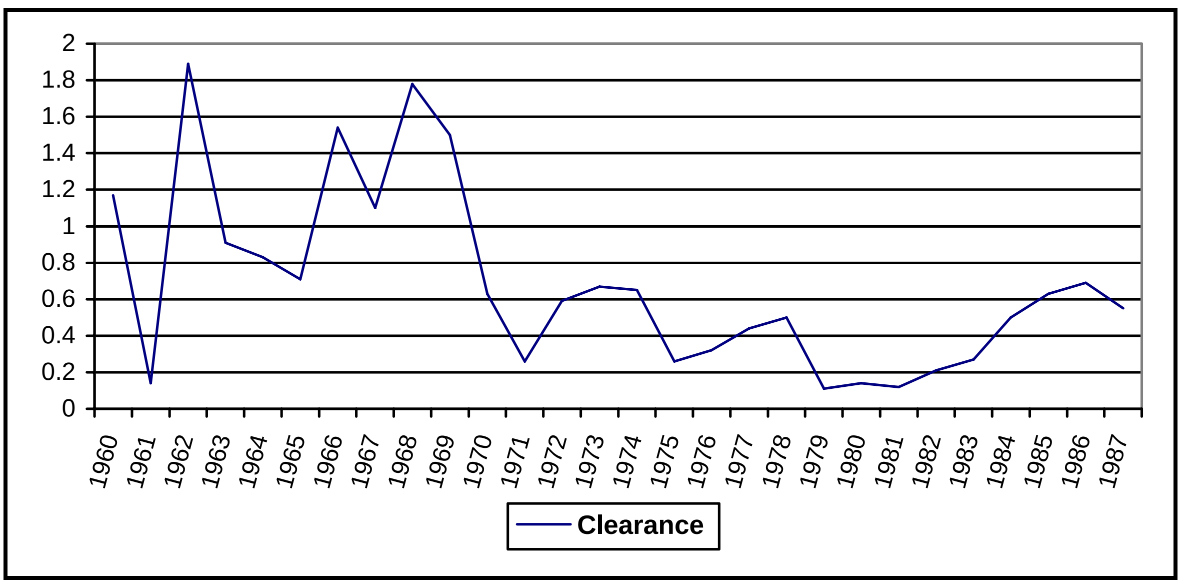
[15] Of the 2,656 Supreme Court cases decided between 1963 and 1997, one third involved land disputes (Alabi 2002).

[16] For example, the clearance rate for 1960 is based on five cases that whose decisions were actually reported in 1966, 1968, and 1975. More land cases were almost certainly filed in 1960, but the only information available about 1960 is from the law reports, which announce when cases are decided.

findings. Indeed, practicing barristers as well as legal scholars warned me during my field research that land cases take notoriously long time periods to resolve. Contrary to this anecdotal evidence, the two types of cases in my sample are actually highly correlated. Ideally such a comparison should include several types of cases but the evidence is sufficiently robust here (Pearson's $R > 0.9$) that we can proceed while doing very little harm to measurement accuracy when it comes to this particular concern.

A clearance rate of less than one indicates that the court is creating backlog, while a rate greater than one means that the court is disposing of cases faster than it is receiving them. It might also indicate that fewer cases are being filed. Figure 5 charts the *clearance* variable over time, from 1960 through 1987.

Figure 5: Clearance Rate, 1960 – 1987



The *clearance* variable shows that the courts operated efficiently throughout the 1960s, where the average clearance rate was 1.16 (impressive perhaps for a new democracy). The 1970s were moderately inefficient, with an average clearance rate of 0.48 between 1970 and 1978. The next nine years had an average clearance rate of 0.36.

Since the *clearance* variable only includes data through 1987, I construct an alternative measure using a closely correlated measure of judicial performance. I construct this variable, *alt-clear*, using data on the number of Awaiting Trial Persons. The first step in this process is to explain and illustrate ATP trends in Nigeria. ATPs, as the acronym implies, are imprisoned persons awaiting trial. More often than not, the police have not even charged them with a crime yet. Several factors can contribute to the ATP population including problems with granting bail or inadequate police resources for conducting investigations. Regardless, it is reasonable to infer that a high percentage of ATPs means an increase in court congestion. Senior prison official suggest this is the case. One commented, "There is no prison congestion – there is court congestion."[17] Officers throughout the judicial system share this view; a Ford Foundation survey found that 71 percent of respondents blame high ATP rate on the courts (Ajomo and Okagbue 1991).

Where my present data set of land and companies cases can measure only from 1960 through the late 1980s, data for awaiting trial persons cover 1967 runs through 2003. There is a margin of error in the case clearance statistics due to coding, and the possibility of incomplete information in the various law reports used. The data on ATPs are more precise because they are based on actual prison population counts. The Bureau

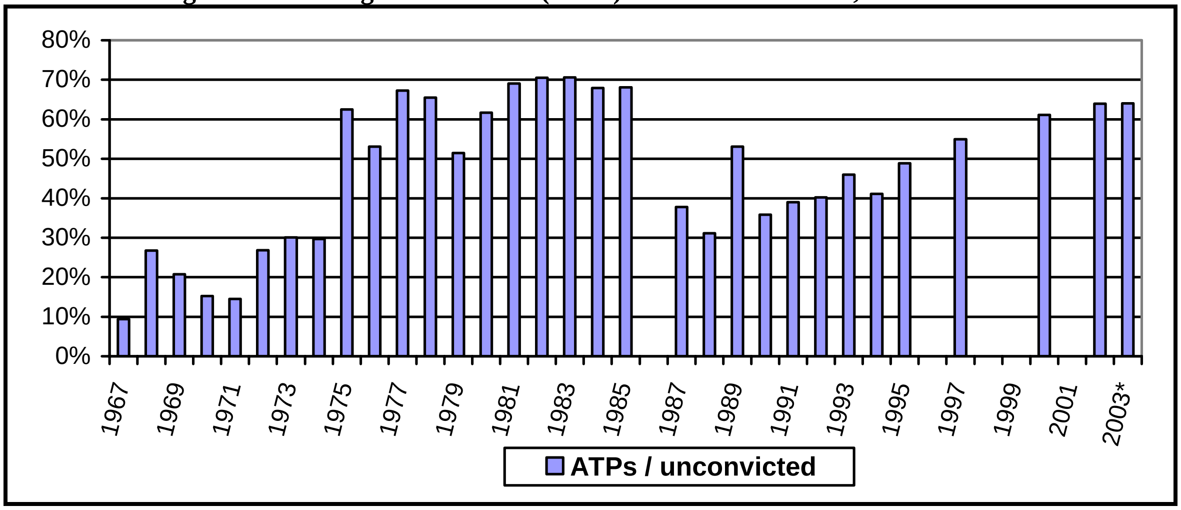
[17] My source is an Assistant Controller of Prisons, National Prisons Service, Abuja, May 13, 2004.

of Prisons began systematically tracking the number of ATPs in 1967.[18] Figure 6 reports the prison population figures on ATPs provided by the Bureau's *Annual Reports*. Three qualifications about the calculations reported here are in order: First, the statistics begin by relying on prison population figures as reported by the Bureau. The Bureau later shifted to report prison *admission* statistics; this change is not visible here. Second, it includes the prisoners who are "detainees," a classification meaning they might not be charged at all. Such a consolidation of categories is justified since the detainee class amounts to no more than 1.5 percent of all admissions for any given available year. Third, the calculations also draw no distinction between ATPs, the technical legal term used by the Bureau, and prisoners reported as "unconvicted" in other Federal Government sources.

According to Figure 6, the number of ATPs increased dramatically in 1975. Between 1967 and 1974, the average number of ATPs was only 21.6 percent. From 1975 to 1985 the average was 64.3 percent. Between 1987 and 1997, the figure dropped to 41.4 percent. The number of ATPs increased again in the last three years, reporting an average of 63 percent from 2000 to 2003. An internal review document prepared by the National Planning Commission in May 2004 attributed the increased prison congestion to the judicial system's inefficiency (National Planning Commission 2004).

[18] Other data, which I have been unable to obtain, date back at least as far as 1938 (Tamuno 1988,). The methods of reporting varied, with the Bureau reporting its statistics according to monthly average, yearly cumulative or sometimes the total number as of December 31.

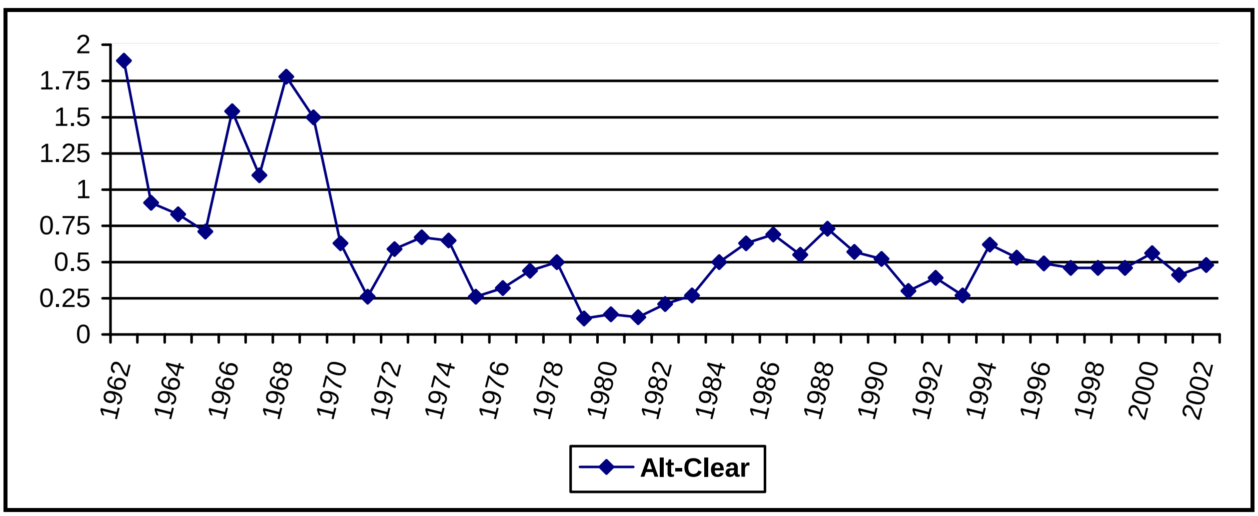
Figure 6: Awaiting Trial Persons (ATPs) as Share of Inmates, 1967 – 2003



The logic of my parallel measure, *alt-clear* rests on an assumption that ATPs and clearance rates should be inversely related. This is because the latter measures the efficiency the courts while ATPs captures inefficiency. It also assumes that criminal and civil cases are handled at similar rates. For example, an increase in the number of ATPs should correspond with a lower clearance rate. To test this intuition, I constructed a sample with the corresponding years available for both sets (1967 through 1987). The results of this test show that the statistical relationship between ATPs and the clearance rate is as expected. The Adjusted-R^2 is 0.299, the coefficient is negative as expected, and the test is statistically significant at the .01 level. The test results are summarized in Appendix 4. This relationship gives me sufficient confidence to construct *alt-clear* as an alternative measure of judicial performance by using ATPs to predict the clearance rate.

Creating *alt-clear* and extending it to all the years of my study poses two challenges: First, as explained above for the *clearance* variable, it is not possible to report a clearance rate for the years after 1987. I compensate for this by using the predicted values for 1988 and years 1994 to 1997. Next, for years 1989 to 1993 I use the case disposal rate of all cases that came before the Supreme Court as reported in Alabi (2002, 182). Since this reflects the actual total number of cases disposed and cases pending (rather than cases reported in law reports), it offers a good proxy for clearance. Finally, I report the clearance rate for 1999 as .45, for 2000 as .56, and for 2001 as .41. These figures are based on case disposal rates for two states from a study on judicial efficiency funded by the U.S. Agency for International Development (National Center for State Courts 2003b; National Center for State Courts 2003a; National Center for State Courts 2003c). Estimates for 1996, 1998, and 2002 are based on the averages of the nearest years. A second challenge is that figures are missing for 1986, 1996, 1998, 1999 and 2001. I resolve this by estimating ATPs for the missing years using the averages of the nearest years. The estimated clearance rate is illustrated in Figure 7 as the *clear-alt* variable.

Figure 7: Clearance Rate, 1962 – 2002 (including estimated values)



Courts in the early 1990s are disappointing but not quite as bad as the early 1980s. They subsequently improve but cases in the mid-1990s are still cleared at about half the rate that new ones are received. At the very least, this provides an empirical basis for what scholars have long maintained about the inefficiency of the courts.

Public Policy and Fiscal Discipline

My last measure of my government performance is fiscal discipline, which captures the ability of the government to restrain itself from spending in excess of revenue levels. Fiscal discipline is a useful measure of performance for three compelling reasons: First, it meets the narrow definition of a "pure" public good. It is neither excludable non-rivalrous in consumption. Unlike education, it is a purely national-level indicator whose benefits are neither geographically targetable nor easily disaggregated.[19] Second, budgetary discipline has important developmental consequences. It may contribute to low inflation or economic growth. But maintaining fiscal discipline presents a political challenge because such policies are often not in the immediate interests of incumbents (Bueno de Mesquita and Root 2000). Fiscal discipline thus poses a classic collective action problem because self-interested incumbents have little incentive to be fiscally responsible in their own spending proposals as long as other incumbents are doing so. This behavior can promote their own survival or serve their constituency but it also exacerbates budget deficits. Their policy preferences are individually rational but lead to the collectively irrational outcome of fiscal indiscipline.

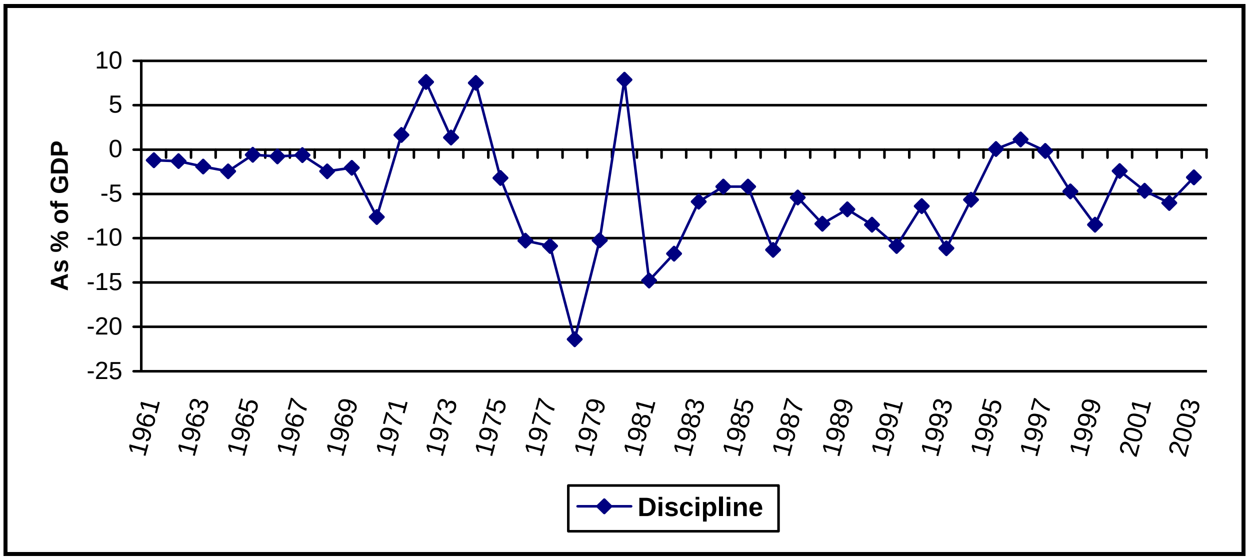
[19] Arguably, no public good is "pure" because an interest group or a sector of the economy (or a class) might benefit while the nation as an aggregate whole suffers. Feng, for example, argues that even inflation is not a pure public good because high inflation benefits creditors and private interests who hold debt (Feng 2003).

A third reason for incorporating fiscal discipline is that a variety of political institutions have a demonstrable effect on fiscal discipline. North, for example, argues that institutions shape the margins at which political actors make macroeconomic choices. "The polity and the economy are inextricably linked." Political institutions enforce property rights, and affect the transaction costs involved in macroeconomic and macroeconomic policies (North 1990).[20] Where policy actors are modeled as "veto players," Tsebelis argues for their causal impact on macroeconomic performance including inflation and deficits (Tsebelis 2002).

Studies of budget rules and processes generally operationalize discipline in terms of budget deficits (Alesina and Perotti 1996, 401-7). Nigerian economists also frequently use budget deficits to analyze fiscal discipline (Egwaikhide 1996; Ariyo 1996, 263-278). Consistent with these views, I operationalize fiscal discipline in terms of budget deficits. Figure 8 plots the variable *discipline* which shows budget deficits as a share of Gross Domestic Product.[21]

[20] For a contrary view, see Feng (2003). He finds that political instability impacts inflation. But neither regime type nor the government's political capacity to extract revenue impacts macroeconomic outcomes (Feng 2003).
[21] The Central Bank of Nigeria reports 1961 – 1964 in fiscal rather than calendar years. To calculate surplus, I convert fiscal years to calendar years using the following procedure: (previous FY * .25) + (current FY * 0.75). Similarly, the CBN only reports nine months for 1968 and nine months for 1969, so the figures I report for these years are estimates based on a twelve month calendar year.

Figure 8: Budget Deficit/Surplus, 1961 – 2003



The data show that the government ran surpluses in 1971-1974 and 1980, and comparatively small surpluses in the mid-1990s. In all other years the federal government ran deficits, although the deficits for 1961 to 1963, 1965 to 1967, and for 1997 were relatively small (amounting to less than 2 percent of GDP). The most egregious deficits, where the deficit amounted to over 10 percent of GDP, occurred from 1976 to 1979, in 1981, 1982, 1986, 1991, and 1993.

CONCLUSION

This chapter began by describing public goods as a tool commonly used for measuring my dependent variable, government performance. I discussed some issues that arise when different types of variables are used to measure government performance, especially excludability. Then I identified measures of performance in education, judicial efficiency, and fiscal discipline. I claim that these measures capture a range of publicness based on the excludability of their consumption.

I then summarized four decades of performance for each of my variables. With my first measure of education performance, student/teacher ratios were lowest in the early 1960s. The early 1980s and the mid 1990s were the only other two periods where the ratio reached modest levels. The worst years occurred in the late 1970s, the late 1980s, and 1999-2000. The number of schools generally increases over time. But I illustrate a steep increase starting in the mid-1970s, a slump in the late 1980s, and the slight downturn after 1999.

I then measure the efficiency of education policy on teachers and schools. My model based on primary school teachers shows that the most efficient spending occurs in the 1960s generally, a brief period in the mid-1990s, and to some extent in the early 1980s. The most wasteful spending on education occurs in the late 1970s, and late 1980s into the early 1990s. Spending is also wasteful between 1999 and 2001. The model based on primary schools shows that schools in the early 1960s were slightly below the predicted number. The figure improves for the remainder of the decade. Levels are low from 1971 to 1973 but from 1973 to 1977 the number is higher than expected. The 1980s are full of seemingly random ups and downs. 1994 to 1998 show notably higher than predicted number of schools and this situation is reversed in 1999.

Next, I summarized performance of my measures for policies that more closely resemble pure public goods. I find that the courts operated efficiently throughout the 1960s and the 1970s were moderately inefficient. I build an alternative measure of efficiency based on a highly correlated measure of judicial performance and other detailed studies to extend my data beyond 1987. These estimated values of performance show that courts in the early 1990s are disappointing but not quite as bad as the early

1980s. They improve subsequently but cases in the mid-1990s but are still quite low. For fiscal discipline, my other measure of public goods, the data show the government ran surpluses in 1971-1974 and 1980, and comparatively small surpluses in the mid-1990s. In all other years the federal government ran deficits, although the deficits for 1961 to 1963, 1965 to 1967, and for 1997 were relatively small. The most egregious deficits occurred from 1976 to 1979, in 1981, 1982, 1986, 1991, and 1993.

What might explain this variation in government performance? Regime type is one such explanation. If democracies perform better than dictatorships, the above variables merely need to be evaluated for each Nigerian regime to determine which type performed better. The next chapter tackles this question by testing and rejecting a hypothesis based on regime type. Even when controlling for influxes of oil revenues, there is little evidence that democracies perform better than dictatorships.

APPENDIX 1:

Educational Inputs and Outcomes: Some Preliminary Evidence from Nigeria

Do inputs, such as smaller class sizes or increases in education spending, improve student performance? There are two fairly distinct positions on this issue: Ever since a seminal study of the American education system by Coleman in 1966, one group of economists and social scientists have claimed that there is no real linkage between student-teacher ratio or spending, and student performance (Coleman and et al. 1966).[22] Hanushek claims there is "no strong or systematic relationship" between school expenditures and student performance (Hanushek 1986, 1141-77). In a later survey of developing countries, he argues that school facilities and various measures of educational inputs have an ambiguous impact on educational achievement and test scores in particular (Hanushek 1996, 227-46). Other education studies similarly claim that institutional differences, rather than investment in education, better explain variation in student performance (Wobmann 2003, 117-40).

Several scholars challenge the seemingly counter-intuitive findings by Hanushek and Coleman. Card and Krueger ask whether the level school resources can explain educational or income outcomes of succeeding African-American and white cohorts in segregated public schools in North and South Carolina. Although they qualify their results by pointing to inadequate data on family background (because wealthier families tend to spend more on education), they find that school resources have a positive effect on both of these areas (Card and Krueger 1996, 31-50). Case and Deaton's study of

[22] Similarly, the National Association of Scholars, an independent group of American educators, released a report in February 2005 which argued that small schools have more staff turnover and fewer relevant resources to offer students. The report argued that American schools should have a minimum of 500 students. See Diane Ravitch, "Failing the Wrong Grades," *New York Times* op-ed, March 15, 2005.

South Africa also finds a clear linkage between educational inputs (measured by pupil-teacher ratios) and outputs (measured by the probability of enrollment and standardized test scores). Their study is especially convincing because they note that it was extremely difficult for non-white families to move during the apartheid-era, thus reducing a potential endogeneity problem present in a system where families can simply move to better school districts (Case and Deaton 1999, 1047-88). Studies of other African countries suggest that cost of education may be the decisive factor. Kremer argues that families often prefer to send their children to schools that are less expensive, even if it means subjecting their children to larger class sizes. He found this to be the case in Kenya, where growing enrollments led to a 50 percent increase in their children's class size, but parents saw this as a worthwhile tradeoff in return for free uniforms, textbooks and materials (Kremer 2003, 102-6).

The relationship between class size and matriculation rates, or between education spending and test scores, is important because it addresses the link between policy inputs and actual policy outcomes. In Nigeria, this is an especially relevant question given the federal government's sometimes dramatic policy commitments in this area. Yet this is a highly under-explored area of research in Nigeria. Is the link between policy inputs and educational outcomes weak, as Coleman and Hanushek claim? Or should governments reduce class sizes and increase educational resources as Case and Deaton argue? To answer these questions I begin by summarizing educational outcomes, measured using standardized test scores. I then test one hypothesis which posits that small class size improves outcomes, and a second hypothesis which states that spending on education improves outcomes:

H1: smaller class size improves outcomes

H2: more education spending improves outcomes

I examine educational performance by looking at 20 years of standardized test scores obtained from the West African Examination Council. WAEC is one of the major standardized tests for West African secondary students who intend to continue their education. My data set covers almost all of the exams from 1983 to 2003. Since 1980 the General Certificate of Education (GCE) "O/Level" (meaning ordinary level) has served as the critical examination for gauging secondary student achievement. Administered by WAEC, the GCE was established for those who might not be able to attend a formal school but who wanted to continue their education. It also targets secondary school pupils who had not achieved the higher standard required for the School Certificate Examination (Federal Ministry of Education 1990; Agbodeka 2002).[23] The advantage of using WAEC, as opposed to the Joint Admissions Matriculation Board (similar to the Scholastic Aptitude Test administered in the United States), is that WAEC is an internationally defined standard giving the scores a greater sense of objectivity. The passing rate of the JAMB might only reflect Nigerian evaluation of Nigerians, while WAEC measures results from a regional test created from and for European educational standards.

[23] Like all standardized tests, the ones administered by WAEC are not perfect. Teachers often complained about enrollments dropping unless their curriculum was geared towards topic necessary to pass the GCE, and spikes in mass cheating forced WAEC to cancel thousands of exam results. See "Truth or Use," *West Africa*," March 31, 1962, p. 352, and "WAEC Flunks It," *Sunday Tribune*," October 11, 1981, p. 5.

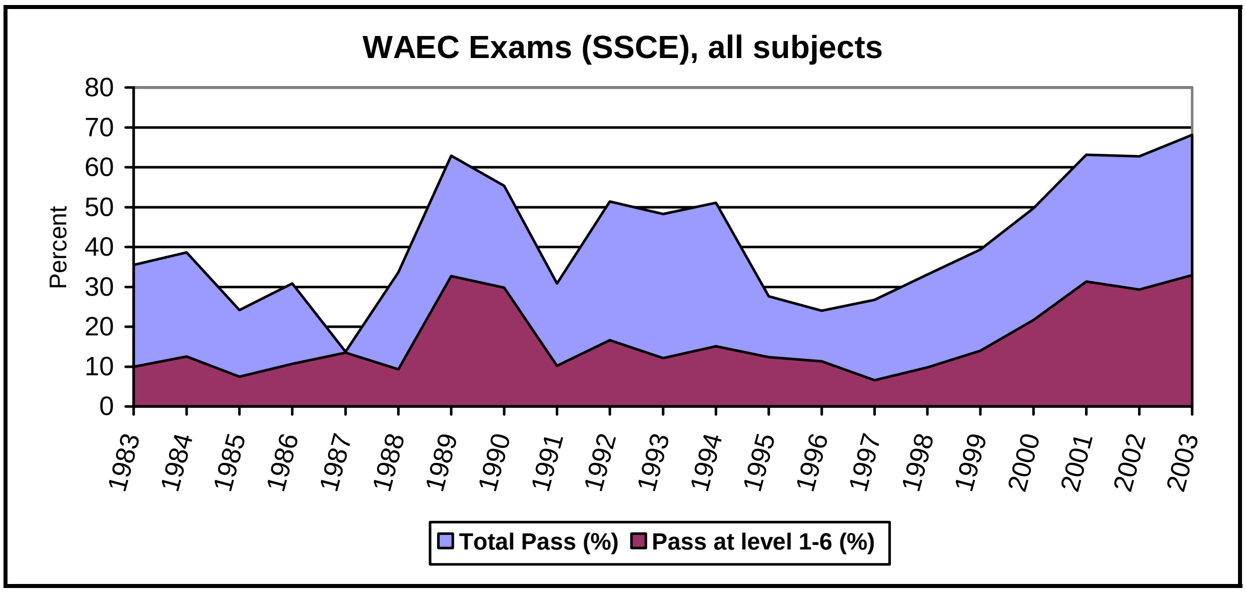
WAEC is part of a long tradition of formal testing in Nigeria. Formal testing based on European education standards dates back to 1842 in Nigeria when teachers pressed dedicated students to take the University of Cambridge examinations. At first such tests were administered by schools and taken by school-sponsored candidates. But soon private candidates (those either not enrolled in school or attending a non-recognized school) were allowed to take the exams. In the period just preceding independence, colonial administrators recognized that the University of London School Examinations and the Cambridge tests were necessary to develop well-trained manpower for the post-independence period. By the 1950's interest in standardized testing had grown so much that numerous other examining boards offered their exams in British territories throughout Africa and the Caribbean. WAEC was established to meet these demands and to ensure that students were treated fairly by the administering bodies (Agbodeka 2002).

Figure 9 reports results for the May/June Senior Secondary Certificate Examination (SSCE), which replaced the GCE O/Level in the 1980s.[24] Its statistics are aggregates covering all subjects. The number of candidates for a given year is usually higher than the number of those students who actually sat for the tests, suggesting that many registered students do not show up for the tests. Passing rates are reported in two ways in the tables below: First, the overall passing rates reported below reflect the total percentage of students who passed as a share of the number of pupils who sat for the test.

[24] I don't run tests here on three other possible data sets for 1983 – 2003: The first set reports all results for GCE exams but several years are missing. The second set reports the results for the English and math subject tests for Senior Secondary Certificate Examinations administered in May/June. The third set reports English and math test results from the General Certificate of Education (GCE) administered in November/December. These GCE results are only from the ordinary level ("O-level") exams, which replaced the London University matriculation exams offered until the early 1950's. The Higher School Certificate Examinations advanced level tests ("A-level") are not included.

In WAEC's early years in the 1950's and 60's, passing was ranked by three divisions of students. Later these were expanded into eight rankings; the first two divisions are approximately the equivalent of levels 1 through 6 today, while the third division is the same as levels 7 and 8.[25] Students who achieve these latter rankings qualify for admission to the less competitive post-secondary schools only. Thus the second way in which passing rates are reported is the percentage of students who pass at levels 1 through 6 out of all the students who sat for the test. This figure represents those students who qualify for Nigeria's first tier schools.

Figure 9



There are three periods where the results seem clear: first, an improvement in the passing rate roughly between 1987 and 1990. Second, a high pass rate between 1993 and 1995, followed by a sharp decline. For example, in 1994, 51.7 percent of test takers

[25] Additionally, a very small number of students – not reflected in the figures here – pass "with distinction."

passed the SSCE exam. By 1997 or so, the passing rate had dropped considerably. The passing rate has been increasing steadily since about 1997.

My variable for student/teacher ratios in secondary schools is not stationary. I also use nearest-average estimations for 1988 and 1989 since no figures for these years are available. Consistent with the steps I take to control for time throughout this chapter, I de-trend it with first difference tests; these results are reported below. I use *SSCE* and *GCE* as two separate dependent variables indicating passing rates for these tests. I transform the variable to time $t + 1$ with the expectation that it takes at least one year for the effects of student teacher ratios to impact test scores. The model testing my first hypothesis about the impact of student/teacher ratios on educational outcomes can thus be stated as:

$$\text{Equation 5:} \quad \hat{Y}_{t+1} = \alpha 0 + \alpha 1\ (\Delta sec.s.t._{t}) + \varepsilon_{t}$$

The results of these tests are reported in Table 2.

Table 2: Impact of Secondary Student/Teacher Ratio on Test Scores

	$SSCE_{t+1}$	GCE_{t+1}
Δsec.s.t.	1.279	1.427*
De-trended secondary s/t ratio	(1.280)	(1.869)
N	19	16
Adj-R^2	.034	.142
DW	.709	1.605

t-statistic in parentheses
*significant at the .1 level
**significant at the .05 level ***significant at the .01 level

I test my second hypothesis in a model where:

$$\text{Equation 6:} \quad \hat{Y}_{t+1} = \alpha 0 + \alpha 1\ (\Delta ed.all_{t}) + \alpha 2\ (ed.budget_{t}) + \varepsilon_{t}$$

The results of these tests are reported in Table 3.

Table 3: Impact of Education Spending on Test Scores

	$SSCE_{t+1}$		GCE_{t+1}	
	(1)	(2)	(1)	(2)
Δed.all De-trended fed. ed. spending	.000* (2.048)	.001** (2.788)	.000 (1.680)	.000 (1.138)
Ed.budget Education as % of fed. budget		-333.984* (1.752)		88.092 (.509)
N	19	19	16	19
Adj-R^2	.151	.243	.108	.059
DW	1.228	1.169	1.667	1.624

t-statistic in parentheses
*significant at the .1 level
**significant at the .05 level ***significant at the .01 level

While the results for all of these tests are based on the limited data available, I report some evidence of a relationship between student/teacher ratio and test results. I find a statistically significant relationship between education spending and the passing rate. This is particularly true for the impact on SSCE, where the model without education as a share of the budget is nearly significant at the .05 level (p = .056). The Durbin-Watson Statistic for that model shows no autocorrelation. With the GCE as the dependent variable p = .115, meaning it is almost significant at the .1 level. The tests for the impact of federal spending, displayed in Table 3, are only significant where SSCE is the dependent variable. This means education spending in fact impacts educational outcomes, much as Card and Kruger and others suggest. These test results are certainly preliminary and the conclusions are tentative. But they provide an additional rationale for the operationalizations utilized throughout this chapter.

APPENDIX 2: Tests for Stationarity of Dependent Variables

Augmented Dickey-Fuller (ADF) Unit Root Test, where:

Model 1: $\Delta x_t = \mu + \varphi t + \alpha X_{t-1} + \varepsilon_t$

Model 2: $\Delta x_t = \mu + \alpha X_{t-1} + \varepsilon_t$ (assuming: $t = 0$)

Model 3: $\Delta x_t = \alpha X_{t-1} + \varepsilon_t$ (assuming: $\mu = 0$, $t = 0$)

H_0: $\alpha = 1$ and H_1: $\alpha \neq 1$

Reject H_0 if *t*-statistic < critical test values

I = variable integration over time and I(0) = stationarity

Table 4: Tests for Stationarity

	Level			First Difference			Decision
	(1) Intercept test (trend, const)	(2) Trend & Intercept (const, no trend)	(3) None (no const, no trend)	(1) Intercept test (trend, const)	(2) Trend & Intercept (const, no trend)	(3) None (no const, no trend)	
Pri.s.t. Primary s/t ratio	-3.85**	-3.12**	0.51	-9.61***	-9.65***	-9.68***	I(0)
Pri.schl_1 Schools1, Lead +1	-2.71	-1.32	0.55	-2.92	-3.01**	-2.77***	I(1)
Ed.all Education spending	-2.56	-2.46	-1.32	-7.07***	-7.17***	-7.22***	I(1)
Pri.enrol Gross enrollment	-2.43	-0.71	1.11	-3.81**	-3.88***	-3.38***	I(1)
Ed.budget Educat. as % budget	-4.43***	-3.63**	-0.20	-6.96***	-7.02***	-7.08***	I(0)
Teachers1 Primary s/t (residual)	-4.24***	-4.09***	-4.13***	-5.33***	-8.95***	-9.05***	I(0)
Schools1 ΔPri.Schl_1 (residual)	-3.29*	-3.24**	-3.31***	-10.84***	-10.89***	-11.03***	I(0)
Clearance Observed rate only	-4.13**	-3.34**	-1.98**	-9.00***	-9.22***	-9.41***	I(0)
Alt-Clear Clearance w/estimates	-4.71***	-4.14***	-2.31**	-3.40*	-4.71***	-2.31**	I(0)
Discipline Budget Surplus/Deficit	-4.44***	-4.36***	-4.18***	-7.12***	-7.21***	-7.30***	I(0)

Reports ADF test-statistic: *significant at the .1 level; **significant at the .05 level; ***significant at the .01 level

APPENDIX 3: Policy Efficiency Model Summaries

Table 5 displays the results of tests predicting the effects of federal education spending on the primary student/teacher ratio from 1961 to 2002. Spending has been deflated and the variable *d-ed.all* has been de-trended to make it stationary. The t-statistic improves in the second model after the introduction of the variable *ed.budget*, which measures education spending as a share of the federal budget. The Durbin-Watson statistic also improves but still shows some indication of autocorrelation. As stated earlier, tests using this models' residual as the dependent variable need to be read with caution. Where ŷ is the student/teacher ratio (*pri.s.t.*) at time *t*:

Equation 3: $\hat{Y}_t = \beta 0 + \beta 1\ (\Delta \text{ed.all}_t) + \beta 2\ (\text{ed.budget}_{\ t)} + \mu_t$

Table 5: Generation of Teachers Residual

	Pri.s.t.	
	(1)	(2)
Δed.all De-trended Fed. ed. spending	-9.01E-006 (.376)	-4E-005 (1.572)
ed.budget Educat. As % of budget		.730*** (3.359)
N	41	41
Adjusted R^2	-.022	.191
Durbin-Watson	.692	.968

Absolute value of t-statistic in parentheses
*Significant at the .1 level; **Significant at the .05 level;
***Significant at the .01 level

Table 6 shows the effects of education spending on the number of primary schools in year *t+1* where the variable has been de-trended. Again I use *ed.budget* as a control variable. Also, here I am able to use gross enrollment statistics. The model is highly significant and the Durbin-Watson statistic shows no evidence of autocorrelation. Where ŷ = $Pri.sch_t$ - $Pri.sch_{t-1}$:

Equation 4: $\hat{Y} = \beta_0 + \beta 1\,(\Delta ed.all_t) + \beta 2\,(\Delta Pri.enroll_{\,t}) + \beta 3\,(ed.budget_t) + \mu_t$

Table 6: Generation of Schools Residual

	ΔPri.Sch $_{t-1}$		
	(1)	(2)	(3)
Δed.all De-trended Fed. ed. spending	.027** (2.519)	.028*** (2.772)	.020** (1.993)
Δpri.enroll De-trended gross enrollment		.001** (2.335)	.001* (1.814)
ed.budget Education as % of budget			226.800** (2.216)
N	40	40	40
Adjusted R^2	.121	.213	.288
Durbin-Watson	1.188	1.320	1.338

Absolute value of t-statistic in parentheses
*Significant at the .1 level; **Significant at the .05 level;
***Significant at the .01 level

APPENDIX 4: Correlation between Awaiting Trial Persons and Clearance Rate

Table 7: Correlation Between ATP and Clearance

	Clearance
ATPs	-1.156 (3.017)**
N	20
Adj. R^2	.299
Durbin-Watson	1.142

Absolute value of t-statistic in parentheses
**significant at the .01 level

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