MANAGEMENT OF BUREAUCRATS AND PUBLIC SERVICE DELIVERY: EVIDENCE FROM THE NIGERIAN CIVIL SERVICE*

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We study how the management practices bureaucrats operate under correlate with the quantity of public services delivered, using data from the Nigerian Civil Service. We have hand-coded independent engineering assessments of 4,700 project completion rates. We supplement this with a management survey in the bureaucracies responsible for these projects, building on Bloom and Van Reenen (2007). Management practices matter: increasing bureaucrats' autonomy is positively associated with completion rates, yet practices related to incentives/monitoring of bureaucrats are negatively associated with completion rates. Our evidence provides new insights on the importance of management in public bureaucracies in a developing country setting.

The effective functioning of government bureaucracies matters: it is an important determinant of poverty, inequality and economic growth as stressed by the emergent literature on state capacity (Acemoglu, 2005; Besley and Persson, 2010). Effective public service delivery also matters from a microeconomic perspective: programme evaluations of small-scale interventions that often assume successful interventions can be effectively scaled-up by government.

However, despite the importance of government effectiveness for citizen welfare, economic analyses of incentives in the public sector have largely focused on the selection and motivation of politicians (Besley, 2004; Gagliarducci and Nannicini, 2013; Martinez-Bravo, 2014), or on the response to incentives of frontline staff such as teachers and health workers (Muralidharan and Sundararaman, 2011; Duflo *et al.*, 2012; Ashraf *et al.*, 2014). In both rich and poor country contexts, there is little evidence linking the managerial practices the vital middle-tier of bureaucrats operate under, to public service delivery. Similarly, the public administration literature is almost devoid of concrete evidence linking practices in civil service organisations to public goods outcomes (Goldfinch *et al.*, 2012). It is this knowledge gap that we start to fill.

More precisely, we study the correlates of effective public service delivery in a developing country context: Nigeria. To do so, we combine novel data sources

linking the outputs of government bureaucracies with our own survey data eliciting a range of management practices that bureaucrats are subject to. We thus provide among the first large-scale descriptive evidence on whether the management practices bureaucrats operate under, correlate with the quantity and quality of public services delivered. We do so in the context of an important developing country, Nigeria, and at a time when many developing countries are engaged in reforming bureaucracies in line with the 'good governance' agenda of the World Bank and United Nations (Goldfinch *et al.*, 2012; Hasnain *et al.*, 2012).

Our analysis exploits a unique period of history in the Nigerian civil service, during which the activities of public bureaucracies were subject to detailed and independent scrutiny. During this period, quantitative information was collected to measure the actual implementation success and quality of public sector projects in various social sectors. The scrutineers were independent teams of engineers and members of civil society. We have hand coded this information to obtain assessments of completion rates for over 4,700 public sector projects that began in 2006/7. The aggregate budget for these projects is US$800 million or 8% of all social spending in Nigeria during our study period. Hence, we are able to make progress against two constraints that have previously restricted research on public service delivery in developing countries (Banerjee *et al.*, 2007):

(*i*) the process of project implementation is rarely quantifiable; and
(*ii*) public good quality is difficult to measure.

Our core contribution is to supply novel evidence on how management practices for bureaucrats in civil service organisations correlate with public service delivery in a developing country context, where bureaucrats enjoy long tenure, there is little movement of individuals across bureaucratic organisations and corrupt practices are common. We provide among the first pieces of large-scale descriptive analysis of the functioning of this vital middle-tier of the bureaucracy that has wide-reaching implications for research from both a macro and micro perspective. We overcome data constraints that have limited earlier work, including the measurement of the quantity and quality of public services provided, and extending techniques to measure management practices into the realm of bureaucracies.

Our results confirm that two dimensions of management practice emphasised by the public administration and economics literatures: autonomy and incentives/monitoring, robustly correlate with the quantity and quality of public services delivered. Our findings provide support to the notion that public agencies might delegate some decision making to bureaucrats (Simon, 1983), at least for the types of small-scale rural infrastructure project we mostly consider. We also provide suggestive evidence in line with interpretations of why management practices related to incentives/monitoring have detrimental impacts in this setting: bureaucrats operate in a multi-tasking environment, and these management practices pick up elements of subjective performance evaluation (SPE) that lead to other dysfunctional responses among bureaucrats. As such, our results sound a word of caution to the good governance agenda: the simple import of incentive/monitoring practices from

the private sector might backfire in bureaucratic settings. More broadly, our results point to new directions for theoretical research to better understand the contracting environment in public bureaucracies (Dixit, 2002) and lay out an agenda for future research using field experiments to establish causal impacts of management practices in bureaucracies on public service delivery and state capabilities more broadly.

To measure the management practices that bureaucrats operate under, we follow the methodological approach of Bloom and Van Reenen (2007, 2010). We adapt their management surveys to the Nigerian public sector setting, taking account of insights from the public administration literature (Rose-Ackerman, 1986; Wilson, 1989). We collected data on management practices for 63 organisations of the Federal Civil Service in Nigeria, including central ministries and regional development authorities. For each organisation, we focus on the two dimensions of management practice most focused in earlier academic work:

    (*i*) the *autonomy* provided to bureaucrats; and
    (*ii*) the provision of *incentives and monitoring* of bureaucrats.

The autonomy index captures the extent to which:

    (*i*) bureaucrats input into policy formulation and implementation processes; and
    (*ii*) the flexibility with bureaucrats can be reorganised to respond to best practice and project peculiarities.

There are long-standing views in the public administration literature on the importance of autonomy. As Rose-Ackerman (1986) describes, at one extreme lies the view that public agencies ought to delegate as much decision making to bureaucrats as possible, relying on their professionalism and resolve to deliver public services (Simon, 1983). At the other extreme lies the Weberian view that, because the objectives of bureaucracies and society diverge, only an entirely rules-based system of public administration, that leaves little to the individual judgement of bureaucrats, can ensure consistent and acceptable levels of public service.

The incentives/monitoring-based management index captures the extent to which an organisation collects indicators of project performance, how these indicators are reviewed and whether bureaucrats are rewarded for achievements reflected in these indicators. Incentive theory stresses the positive impacts performance incentives and monitoring have on organisational performance. However, *a priori* the correlation between bureaucratic output and the provision of such incentives in public sector settings is uncertain because:

    (*i*) bureaucrats might need to exert multiple effort types, not all of which are measurable;
    (*ii*) the process by which inputs are converted to outputs is uncertain;
    (*iii*) there can be competing views on the right way to implement bureaucratic outputs;
    (*iv*) bureaucratic objectives are not clear cut; and

(*v*) performance incentives might crowd out the intrinsic motivation of those self-selected into the public sector (Perry and Wise, 1990; Benabou and Tirole, 2003; Francois and Vlassopoulos, 2008).[1]

We probe these issues by exploiting a third data source: a survey we fielded to a representative sample of 4,100 civil servants, corresponding to 13% of the total workforce of the 63 organisations we study. This asked bureaucrats about their tenure, employment history, intrinsic motivation and perceptions of organisational corruption. We use this to shed light on how the correlation between bureaucratic output and management practices vary with bureaucrat characteristics.

Our research design exploits the fact that multiple organisations conduct similar project activities. For example, small-scale dams are constructed by the Ministry of Water, the Ministry of Agriculture and the Ministry of the Environment. We therefore assess how the delivery of the same project type varies depending on the management practices in place for bureaucrats in the specific organisation responsible, holding constant project characteristics, such as their technical complexity and scale, as well as the characteristics of organisations and bureaucrats. We use this empirical framework to present three partial correlations relating civil service management practices and public service delivery.

First, management practices correlate with bureaucratic output. However, the two dimensions of management practice related to autonomy and incentives/monitoring have opposing correlations with public services delivered (despite the practices being positively correlated with each other): a one standard deviation increase in autonomy for bureaucrats corresponds to significantly higher project completion rates of 18%, and a one standard deviation increase in practices related to incentives/monitoring corresponds to significantly lower project completion rates of 14%. We find management practices correlate with quality-adjusted project completion rates in similar ways. The backdrop to these findings in Nigeria, where 38% of public projects are never started, implying these magnitudes are also of economic significance.

These are partial correlations. The chief concern is that they might reflect management practices being endogenously chosen: for example, those organisations that have higher completion rates might choose to grant their bureaucrats more autonomy and those that have lower completion rates might respond by increasing monitoring and incentive provision to bureaucrats. Given the lack of exogenous variation in management practices, we are careful to describe our findings as partial correlations throughout and we also present further descriptive evidence to shed light on whether the results might be driven by reverse causality. With this caveat in mind throughout, our findings on autonomy for bureaucrats provide support to the notion that public agencies could delegate some decision making to bureaucrats, relying on

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[1] Evidence is lacking on whether incentives positively impact bureaucrat behaviour (Perry *et al.*, 2009; Hasnain *et al.*, 2012). Muralidharan (2012) discusses why performance pay might be suboptimal in the public sector. Positive impacts of performance pay for frontline teachers have been documented using RCTs in developing countries by Glewwe *et al.* (2010), Muralidharan and Sundararaman (2011), and Duflo *et al.* (2012), although Fryer (2013) finds zero/negative impacts in the US. In health, a nascent literature documents positive impacts of performance pay on frontline workers in developing countries (Miller and Babiarz, 2013). In line with our findings, Ashraf *et al.* (2014) documents how non-monetary incentives elicit more effort than monetary incentives for such tasks.

their professionalism to deliver public services. The evidence is less supportive of the notion that when bureaucrats have more agency, they are more likely to pursue their own objectives or engage in corrupt activities, resulting in fewer public services being delivered. As discussed throughout, this is especially insightful in a context such as Nigeria, where corruption (at all tiers of government bureaucracy) is typically considered a major impediment to economic development.

The robust negative correlation documented between project completion rates and management practices related to the provision of incentives and monitoring of bureaucrats, is also surprising and counter to a large body of evidence from private sector settings. We investigate three underlying mechanisms for this: that bureaucrats operate in a multi-tasking environment (Holmstrom and Milgrom, 1991), that the incentives/monitoring management practices pick up SPE (Milgrom, 1988; Milgrom and Roberts, 1988), and that incentives/monitoring crowd out bureaucrats' intrinsic motivations (Perry and Wise, 1990; Benabou and Tirole, 2003; Francois and Vlassopoulos, 2008). We investigate all three channels by examining how the partial correlations of incentive/monitoring-related management practices vary with project, organisational and bureaucrat characteristics.

We document the negative correlation between these practices and project completion rates is even more negative for:

   (*i*) more complex projects; and
   (*ii*) project types that are of greater ambiguity/uncertainty in design.

Moreover, we find the negative relationship with incentives/monitoring practices is ameliorated in organisations with better IT facilities, that might reflect a greater ability to measure/target incentives towards more productive efforts. These findings are in line with bureaucrats having to exert multiple effort types, and incentives/monitoring practices being mistargeted (Kelman, 1990). We also find the negative correlation between incentives/monitoring practices and project completion rates is more negative in organisations staffed by less experienced bureaucrats, that might reflect civil servants learning how to engage in influence activities when subject to SPE. Finally, on the interplay between incentive/monitoring management practices and bureaucrat motivations, we find the negative correlation between incentives/monitoring is offset by the share of intrinsically motivated bureaucrats in the organisation. Hence, if anything, this suggests crowding-in of bureaucrat effort in the presence of practices related to incentives/monitoring.

While the recent economics literature has emphasised the role of intrinsic motivation, a long-standing literature in public administration emphasises that civil servants pursue their self-interest (Tullock, 1965; Wilson, 1989). Our earlier finding that granting bureaucrats more autonomy is positively correlated with higher project completion rates, already runs somewhat counter to this view. However, our final set of results probe this notion further by exploring how the partial correlation of bureaucratic output and management practices is mediated through perceptions of corruption among civil service organisations. Clearly, in the Nigerian context, the issue of corruption cannot be ignored and it permeates throughout our analysis. We find a large negative levels correlation between completion rates of corruption but the correlations with management practices related to either autonomy or

incentives/monitoring do not vary with perceptions of corruption. This suggests corruption is prevalent but there are few bureaucrats on the margin of being prevented from behaving corruptly because of incremental changes in management practice (at least for the scale of public projects we consider).

The article is organised as follows. Section 1 overviews relevant aspects of the Nigerian civil service. Section 2 details our data sources and empirical method. Section 3 presents our descriptive evidence correlating public service delivery and management practices for bureaucrats. Section 4 discusses why organisations might not be optimising over management practices, presenting evidence on management practices and bureaucrats' time use. Section 5 concludes by highlighting the implications our findings have for a nascent agenda that seeks to measure the impacts of experimentally varying management practices in bureaucracies. The online Appendix presents further data description and robustness checks.

1. Institutional Background

Nigeria is Africa's most populous country, home to 160 million or 20% of the population of sub-Saharan Africa. Like other developing countries, government expenditures represent a significant fraction of GDP (26%), it has generally weak institutions holding government to account and corrupt practices in public sector organisations are commonplace. The British colonial government fashioned its Nigerian administration after the British Parliamentary Civil Service System and this is what passed to an independent Nigeria in 1960. Despite moving to a Presidential system, Nigeria's civil service structure still largely replicates its British colonial origins.[2]

1.1. *Civil Service Organisations*

The Nigerian civil service is organised into federal, state and local government tiers. Our analysis relates exclusively to the federal civil service.[3] Table A1 in the online Appendix lists the 63 federal civil service organisations we provide descriptive evidence on. These include ministries of health, education, environment and water resources and organisations that have regional bases (such as federal polytechnics, federal medical centres, development authorities etc.). Table A1 highlights how these organisations vary in budget, staffing and decentralisation. Federal ministries have the largest budgets and most staff as expected, with regional organisations being deconcentrated from central government.

Each civil service organisation is tasked to provide various types of project. These include construction projects (boreholes, buildings, roads and canals), as well as non-

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[2] The 1999 Constitution has similarities with the US Constitution: legislation is enacted by a bicameral National Assembly composed of the Senate and House of Representatives. Although the introduction of a Presidential system of government in 1979 saw initial reforms to the civil service, later decrees reversed some of these changes.

[3] The Civil Service is governed by a set of Public Service Rules and Financial Regulations, *ad hoc* Circular Instructions, decrees circulated across government and Gazette Notices (decrees published in the Government's gazette). These outline the laws regulating the business of government and cover service appointments, exits, discipline, salaries and other major aspects of official assignments.

construction projects (procurement, training and advocacy). For any given project type, multiple organisations are tasked to implement similar projects. For example, small-scale dams are constructed by the federal ministries of water, agriculture and environment and by all of the river basin development authorities. We therefore assess how the delivery of the same project type is partially correlated with the management practices for bureaucrats in the organisation responsible, holding constant other project, bureaucrat and organisational characteristics.

Underlying our analysis is the notion that civil service organisations place some weight on raising project completion rates: this is likely to be the case because, on average, 79% of the capital expenditure of organisations is related to the kinds of projects we study and completion of these capital projects is often explicitly stated as part of organisations' core mission.

1.2. *The Assignment of Civil Servants and Projects to Organisations*

The Head of the Civil Service of the Federation organises the postings and conditions of Nigeria's federal civil servants. Our representative survey of 4,100 individual civil servants confirms this: 88% of bureaucrats report having no influence over their initial posting, and 60% report their current posting being 'at random'. Once posted, civil servants enjoy job security. Our survey reveals mean tenure at the current organisation to be 13 years, rising to 16 years for senior managers (those above grade level 12). Movements across organisations are rare: 67% of bureaucrats report never having moved organisation. This lack of mobility in the labour market for bureaucrats slows down the rate at which best practices for management spread through the civil service.

Projects are assigned to organisations centrally by the National Assembly, which enacts a budget law specifying the projects to be implemented each fiscal year. The projects we study were all established in law by Budget Appropriation Bills in 2006 or 2007. This legal document defines the responsibilities of civil service organisations in terms of projects to be delivered.[4]

2. Data and Empirical Method

2.1. *Project Completion, Quality and Complexity*

The Nigerian Government began a programme of sweeping reforms in the major organs of government in 2003 (Nkonjo-Iweala and Osafo-Kwaako, 2007). As a result, it received cancellation of US$18 billion of external debt from the Paris Club. At the federal level, the annual savings from debt interest were channelled into the social sectors we study. The Presidency saw this as an opportunity to track the effectiveness of government expenditures and so, in 2006 and 2007, the Nigerian Government

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[4] The passage of these bills is as follows. Having received inputs from the executive branch of government, a draft appropriation bill is presented to the National Assembly. The draft bill is then split into sectors and sent to sectoral committees of the House and Senate. These committees hold hearings with relevant parties to scrutinise proposals, define project budgets and assign projects to organisations. These committees are staffed by politicians with qualifications/experience in the relevant sector. These committees then recommend a budget for the sector to an appropriation committee which merges the recommendations into a single budget. This unified budget is then voted on by both houses to form the Budget Appropriation Bill.

undertook the overview of public expenditure in national economic empowerment and development strategy, known as the 'OPEN initiative', in which it traced, by project, the use and impact of 10% of all federal Government social sector expenditures approved in 2006 and 2007. The projects selected to be part of the OPEN initiative were not only to be representative of existing social sector expenditures but also informative for those projects most needing to be scaled-up nationwide.[5]

Under the OPEN initiative, expert teams visited public projects to record the extent to which they had been implemented as planned in the federal budget. The Presidency contracted national and regional teams to undertake the monitoring process outside the institutions of the civil service. Hence, projects were not evaluated by potentially biased civil servants but rather by teams of independent engineers and civil society. To further ensure the accuracy of monitoring reports, the Presidency put in place a system of checks and balances. First, a centralised team of technocrats monitored the evaluation teams, providing them with training and opportunities for standardisation of their methods. Second, evaluators were asked to provide material, photographic or video evidence to support their reports. Third, the national teams and Presidency performed random checks on evaluated sites. Evaluations of the OPEN process indicate that it successfully achieved its aims (Eboh, 2010; Dijkstra *et al.*, 2011).[6]

We consider projects traced under the OPEN initiative that were approved in the 2006/7 federal budgets (Federal Government of Nigeria, 2008, 2009). Monitoring teams visited project sites 18 months after the project was centrally approved. All the projects we study have 12 month completion schedules, so that even accounting for any delay in the disbursement of funds, it is feasible for these projects to be completed by the time of the monitoring survey. We hand coded the material from all projects recorded in OPEN initiative reports from the federal civil service organisations listed in Table A1.[7] Taken together, the coverage of projects in our sample traces 8% of all Federal Government social sector expenditures in 2006/7 budget years, corresponding to 4,721 projects from 63 organisations, with an aggregate budget of around US $800 million.

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[5] Table A2 in the Appendix shows the distribution of expenditures in the Nigeria federal budget across the social sectors as a whole (column 1), for all projects in the OPEN initiative (column 2) and in our sample of OPEN projects (column 3). This is done for all social sectors with the exception of the Works Sector (that covers trunk roads and constitutes 5% of total social sector expenditure in the federal budget), because the OPEN data we use does not cover that sector. The share of OPEN projects by sector matches closely the distribution of expenditures as a whole. A Chi-squared test of equality of shares across sectors does not reject the null. Evidence from process overviews of the OPEN initiative, including qualitative evidence from local communities on their perception of projects, suggests that the projects included in the OPEN initiative were thought to be welfare improving (OPEN report for North East Nigeria 2006, the Civil Society Organizations Monitoring and Evaluation Report 2007).

[6] Prior to the OPEN initiative, the government had its own monitoring and evaluation systems in place (based on unannounced visits) but these were largely perceived to be ineffective. When OPEN was introduced, OPEN projects were processed through the same standard government channels as non-OPEN projects and so, overall, there was no *ex ante* reason to believe it would be much more effective than the previous monitoring regime. This helps ameliorate concerns that our results pick up a Hawthorne effect in response to the OPEN initiative.

[7] In the water and power sectors, we cover all the relevant federal organisations. In the health sector, we cover 28% of health organisations, with the excluded a subset of the medical service providers such as a number of Federal Medical Centres. Similarly, in education, we cover 14% of education organisations, excluding a range of institutions of learning such as some Federal Colleges of Education.

The OPEN evaluation teams coded:

(*i*) whether the project had started;
(*ii*) its stage of completion; and
(*iii*) the quality of inputs and work.

Our main outcome variable is a continuous zero to one measure of project completion rates, available for all 4,721 projects. A completion rate of zero does not imply the organisation never even attempted to work on the project. Rather, the project might have been prepared, with responsibility for implementation having been delegated to a department and bureaucrats within the organisation. At that point, however, progress on the project halted, with funds either being returned due to lack of use, or being lost. We cannot distinguish whether this lack of implementation reflects active or passive waste (Bandiera *et al.*, 2009). A completion rate of one implies the project matched its full technical specification.

To maximise coverage on project quality, we utilise the most aggregate formulation of quality reporting. A project was either of insufficient quality, satisfactory or commended for an 'above average or high' quality level: 2,206 projects have both quality and completion rates recorded.

Table 1 provides descriptive evidence by project type. Boreholes are the most common, covering 29% of OPEN projects. Most project types are implemented by a range of organisations. There are, for example, 18 civil service organisations constructing boreholes (column (2)). Hence, we study the correlation between management practices for bureaucrats, that vary across civil service organisations, and project implementation, conditional on project-type fixed effects. Column (3) highlights the scale of projects: most constitute the 'nuts-and-bolts' of rural infrastructure development. The median budget for dams is US$18,000, the median budget for a building is US$120,000. It is because projects are relatively small-scale that partly explains why multiple organisations are observed being tasked to implement similar project types. Columns (4)–(7) show completion rates by project type, emphasising variation in completion rates across and within project types. Aggregating across all project types, 38% of projects are never started. Although this might emphasise the role that corruption or passive waste plays, it is not a complete explanation for bureaucrat behaviour: 31% of projects are fully completed, and conditional on being started, the average project completion rate is 0.75. Column (8) shows, across project types, the majority of projects are ranked to be of satisfactory quality.

Table 2 presents descriptive evidence on the public service delivery of the 10 civil service organisations that implement the most projects in our sample. This again emphasises that most organisations are engaged in providing multiple project types. We observe huge variation across these large organisations in the percentage of projects that are never started (11% to 95%) and those that are fully completed (3% to 89%). The final column shows the percentage of projects rated to be of satisfactory quality: here, we observe far greater variation across civil service organisations (25% to 100%) than we previously documented in Table 1 across project types.

These statistics suggest there might be important factors at the organisation level that correlate with this variation in the quantity and quality of public service delivery.

Table 1

Descriptive Evidence on Project Types

Project type	(1) Number of projects (proportion)	(2) Number of implementing organisations	(3) Median budget allocation (US$000s)	(4) Proportion never started	(5) Average completion rate	(6) Proportion completed conditional on being started	(7) Proportion fully completed	(8) Proportion with satisfactory quality
Borehole	1,348 (0.29)	18	29	0.44	0.47	0.84	0.37	0.85
Building	806 (0.17)	32	120	0.37	0.50	0.79	0.34	0.81
Electrification	751 (0.16)	2	93	0.14	0.56	0.65	0.25	0.87
Dam	624 (0.13)	14	18	0.79	0.15	0.74	0.10	0.50
Procurement	345 (0.07)	41	87	0.30	0.58	0.83	0.47	0.85
Road	217 (0.05)	4	167	0.12	0.52	0.59	0.22	0.79
Training	189 (0.04)	26	80	0.20	0.60	0.74	0.42	0.84
Financial project	157 (0.03)	8	17	0.38	0.49	0.79	0.35	0.84
Research	122 (0.03)	21	67	0.11	0.63	0.72	0.52	0.99
Advocacy	86 (0.02)	23	49	0.24	0.61	0.80	0.47	0.94
Canal	76 (0.02)	12	347	0.70	0.14	0.45	0.05	0.92

Notes. The 'project type' classification refers to the primary classification for each project. Other project classifications exist. The median budget allocation in column (3) is in thousands of US Dollars (assuming an exchange rate of US$1: Naira 150). The sample of projects covers those which have a positive budget allocation and for which the proportion completed evaluation variable and management scores are available. The project quality variable in column (8) is not available for all projects. Standard deviations are in parentheses. Figures are rounded to two decimal places where relevant.

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Table 2

Descriptive Evidence on Largest Civil Service Implementing Organisations

Civil service organisation	(1) Number of projects	(2) Number of unique project types	(3) Budget allocation (US$mn)	(4) Proportion never started	(5) Average completion rate	(6) Proportion completed conditional on being started	(7) Proportion fully completed	(8) Proportion with satisfactory quality
Federal Ministry of Agriculture and Rural Development	797	9	144	0.54	0.29	0.63	0.14	0.76
Federal Ministry of Power and Steel	750	1	490	0.14	0.56	0.25	0.65	0.87
Federal Ministry of Water Resources	520	4	426	0.95	0.04	0.77	0.03	0.69
National Primary Health Care Development	447	4	56	0.19	0.64	0.79	0.42	0.75
Sokoto Rima River Basin Development Authority	277	2	23	0.22	0.66	0.85	0.51	0.76
Upper Benue River Basin Development Authority	169	3	13	0.11	0.89	1.00	0.89	0.25
Ogun/Oshun River Basin Development Authority	165	4	22	0.55	0.32	0.71	0.24	0.89
Chad Basin River Basin Development Authority	148	3	16	0.43	0.56	1.00	0.56	1.00
Lower Benue River Basin Development Authority	143	3	16	0.45	0.42	0.77	0.17	0.86
Nigerian Agricultural Cooperative and Rural Development Bank	133	2	8	0.42	0.46	0.80	0.34	0.81

Notes. The sample covers the ten largest civil service organisations ranked by number of projects from our overall sample of projects. The 'project type' classification refers to the primary classification for each project. Other project classifications exist. The budget allocation in column (3) is in millions of US Dollars (assuming an exchange rate of US$1: Naira 150). The sample of projects covers those which have a positive budget allocation and for which the proportion completed evaluation variable and management scores are available. The project quality variable in column (8) is not available for all projects. Standard deviations are in parentheses. Figures are rounded to two decimal places where relevant.

Our focus is on one such factor: the management practices civil service bureaucrats operate under.

When correlating project outcomes to management practices for bureaucrats, it is important to condition on project complexity (Prendergast, 2002). To measure this, we collaborated with a pair of Nigerian engineers familiar with the OPEN initiative and a group of international scholars with research interests in project complexity. The complexity indicators were based on the technical specifications of each project, and constructed following engineering best practice that emphasises multiple dimensions of complexity (Remington and Pollack, 2007). The online Appendix:

   (i) details the construction of these indices, and presents descriptive statistics for them (Table A3); and
   (ii) describes checks in place, using multiple engineers, to underpin the validity of our complexity measures.[8]

These complexity indicators reflect the number of inputs and methods needed for the project, the ease with which the relevant labour and capital inputs can be obtained, ambiguities in design and project implementation, and the overall difficulty in managing the project. Our empirical specification then holds constant the complexity of the project along these dimensions, including issues related to organisations needing to sub-contract project implementation to a private sector firm, for example. This allows us to focus in on the correlation between managerial practices for bureaucrats and project completion rates, all else equal.[9]

2.2. Measuring Management Practices

There has been a revival of interest in studying management practices in the private sector (Ichniowski et al., 1997; Black and Lynch, 2001; Bloom and Van Reenen, 2007 2010; Bloom et al., 2012a, 2013). We follow Bloom and Van Reenen's (henceforth BVR) approach to measuring management practices but adapt their survey tool to the Nigerian public sector setting by taking into account long-standing views on the importance of autonomy in public administration (Simon, 1983; Rose-Ackerman, 1986; Wilson, 1989) and insights from the 'new performance management' and 'good

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[8] Prendergast (2002) also implies that autonomy and incentives are both positively correlated with task uncertainty/complexity. We find:

   (i) autonomy is positively correlated with project complexity (averaged across all projects in the organisation), with correlation coefficient 0.05;
   (ii) however, incentives/monitoring is negatively correlated with project complexity. In an extension to the baseline model, Prendergast (2002) discusses how incentive provision and uncertainly/complexity can be negatively correlated in equilibrium if multi-tasking concerns are greater in more uncertain environments.

This prediction matches the descriptive evidence we provide later, highlighting incentives/monitoring practices have a more negative correlation with complex and atypical projects.

[9] Our civil servant survey also helps to shed some light on the relationship between bureaucratic organisations and such third party contractors/suppliers/consultants. For example, only 6% of civil servants agreed with the statement that, the most successful contractors 'are aligned with the government in some way', only 13% of civil servants reported having been offered a 'small present', 'money' or an 'expensive present' by such contractors.

governance agenda' perspectives (Francois and Vlassopoulos, 2008; Goldfinch *et al.*, 2012).

We worked closely with members of the OPEN office in the Presidency and the Office of the Head of the Civil Service of the Federation to develop our management survey. A number of pilots using semi-structured interviews like those in BVR were held to outline key similarities and deviations from the BVR methodology. The management survey enumerators were trained together for a number of weeks including practice interview sessions before undertaking the first few interviews together. Information on management practices was then elicited from senior management staff in the key departments of each organisation but not from the chief executive officer. While each manager filled in their own questionnaire, the enumerator looked for a consensus and recorded that in her own questionnaire. This is the information we use to construct management practice indices for each organisation.[10]

From September to November 2010, our survey team held interviews at the organisations listed in Table A1. Interviews were 'double blind' so:

(*i*) managers were not told in advance they were being scored or shown a score grid; and

(*ii*) enumerators were given no information on the organisation's performance.

The BVR evaluation tool elicits management practices through a semi-structured interview covering four topics: operations, targets, incentives and monitoring. We apply this approach in the context of public bureaucracies, extending the practices elicited to cover those relevant for managing bureaucrats. Our management survey thus covers nine topics: roles, flexibility, incentives, monitoring, culture, targeting, facilities, skills and staffing. We then replicate the BVR method eliciting information on each of these broad topic areas from our civil service organisations, although we do so using a more limited set of underlying questions related to each topic; some of our questions permit only yes/no replies, while others are based on a full scoring grid. Table A4 details the questions that come under each topic area.[11]

The questions on 'roles' assess the extent to which bureaucrats input into policy formulation/implementation processes. The 'flexibility' questions measure whether a bureaucratic agency is able to reorganise its bureaucrats and adapt tasks to respond to best practice and project peculiarities. We combine answers to the roles and flexibility

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[10] Conducting face-to-face group interviews was judged to lead to more accurate answers than using telephone surveys. Given the interview format, individual manager responses on management practices are available but we cannot link individual managers to specific projects and so do not utilise that information (each project is delivered by teams of bureaucrats across sub-departments): rather, we use the consensus measure recorded by the enumerator. Managers were told their individual responses would remain confidential. We find no relationship between recorded practices and the number of managers present at interview.

[11] Hence, there are two important deviations from how we elicit management practices from BVR. First, we tailored the precise wording of some questions to better fit our context. Second, we did not use the same universe of questions from BVR. In most cases, this was because we could not identify an analogous concept in the public sector that was relevant or not covered by other questions. For example, the majority of questions on lean manufacturing in BVR (e.g. 'What kinds of lean (modern) manufacturing processes have you introduced?') were not utilised. However, those on improving manufacturing processes ('How do you go about improving the manufacturing process itself?') were redefined to relate to procedures in response to new needs or challenges ('Does your organisation make efforts to redefine its standard procedures in response to the specific needs and peculiarities of a community?').

questions to construct an index of management practices capturing bureaucrats' 'autonomy' (CS-autonomy). This allows us to study a key dimension of management that the public administration literature has long emphasised.

The questions on 'incentives' are designed to capture more familiar notions for economists of incentive provision for bureaucrats, both positively in terms of whether rewards are given for some dimensions of service and negatively in terms of punishments for poor service; the questions on 'monitoring' capture practices related to the collection and use of performance indicators. We combine the answers to both topics to construct an index capturing the 'incentives/monitoring' management practices bureaucrats operate under (CS-incentives/monitoring).

The remaining topics cover the following practices: the 'facilities' questions relate to how well-functioning the organisation is, for example, by collecting information on the availability of electricity and Internet facilities to bureaucrats; the 'skills' questions relate to the human capital of bureaucrats, especially their IT competencies and the training offered to them; the 'staffing' questions focus staff recruitment and workload spreads; the 'targeting' questions relate to the existence and clarity of targets and, finally, the questions related to 'culture' elicit information on how colleagues are collectively treated and interact with others outside of the workplace. We combine answers on all these topics to construct an 'other' management practices index (CS-other).

We clearly recognise that there is no definitive way to solicit management practices along these various dimensions, nor a definitive way to collate them into more aggregate indices. Our approach is primarily designed to reflect two broad areas of management practice emphasised in the public administration and economics literatures as being first-order determinants of bureaucrats' behaviour: autonomy and incentives/monitoring. The online Appendix details our findings if we consider alternative indices including:

(*i*) a fully disaggregated specification showing the separate partial correlations of all nine dimensions of management practice;

(*ii*) an aggregate measure of management practice that collates all nine categories into a single index; and

(*iii*) alternative groupings of individual practices into autonomy and incentive/monitoring measures.[12]

The responses to each practice in Table A4 are converted into normalised z-scores (so are continuous variables with mean zero and variance one by construction), where in all cases, variables are increasing in the commonly understood notion of 'better management'. For the CS-autonomy index, we assume greater autonomy corresponds to better management practices (our empirical analysis then assesses whether this is positively or negatively correlated with project completion rates), and similarly for the CS-incentives/monitoring measure. For our core analysis, we aggregate z-scores into the CS-measures by taking unweighted means of the underlying z-scores. In the online Appendix, we show the robustness of our key partial correlations to other weighting schemes.

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[12] We have also used principle components analysis to assess the importance of individual practices through factor analysis. For the matrix of all nine sub-indices, we find that the first factor explains 28% of the variation.

We find the CS-autonomy and CS-incentives/monitoring management scores to be positively correlated with each other (correlation coefficient 0.24), in line with the frameworks set out in Prendergast (2002) and Acemoglu *et al.* (2007): that suggest in more uncertain environments, it is optimal to grant agents more autonomy, in turn, generates greater output-based incentive pay. Hence, in the cross section of federal organisations, the provision of autonomy and performance incentives appear to be complements. However, these correlations are not so high to prevent precise estimation of the separate relationship of each measure to public service delivery.[13]

The gap between the collection of the OPEN data in 2006/7 and the management survey in 2010 raises the question whether practices changed over this time period. For example, organisations with low completion rates might have improved management practices for bureaucrats. However, there is little evidence from other sources of any major civil service reforms being implemented over this period, or of significant changes in the political organisation of federal agencies (Alabi and Fashagba, 2010; Ogundiya, 2011). In addition, we find little evidence of a spike in turnover of bureaucrats coinciding with Presidential elections in 2007: 80% of bureaucrats employed in 2010 were at the same organisation in 2007 (with retention rates being higher among senior managers).

2.3. *Origins of Management Practices*

To understand how management practices come to be, we held structured interviews at four organisations in Table A1. These revealed three common themes:

  (*i*) the Public Service Rules of the Nigerian civil service provide guidelines on how bureaucrats should be incentivised, which are common to all federal organisations;
 (*ii*) the history of senior management staff that have worked in an organisation brings their own innovations to bear; and
(*iii*) the role of external events such as demands of trade unions.

Taken together, these interviews consistently emphasised the slow evolution of management practices, and did not suggest practices were tailored to necessarily maximise public service delivery.[14]

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[13] Such substitution could exist if bureaucrats have strong career concerns and so performance incentives are not required once autonomy is provided. Alternatively, if bureaucrats are intrinsically motivated, they might need only to be provided autonomy and, indeed, the provision of explicit incentives might crowd out their intrinsic motivation. The marginal impacts of these two measures can also be separately identified from the CS-other index: the CS-autonomy (CS-incentives/monitoring) index has a correlation of 0.17 (0.43) with the CS-other measure.

[14] Management practices in all organisations take the Public Service Rules as their foundation. These guidelines relate to the distribution of authority, how bureaucrats should be disciplined etc. In each structured interview, they were said to be central to determining management practice. However, we were repeatedly told a secondary influence on practices was the history of senior management at the organisation. Officials are promoted into management positions based primarily on tenure. Views on management practices are typically aggregated by committee, with the chief executive marshalling the direction of reform. This leads to a relatively slow changing management environment. Finally, external events, such as the demands of trade unions, were said to have a third-tier influence.

More formally, we simultaneously estimate the correlates of each dimension of management practice using a SUR model, at the organisational level. We control for:

(*i*) characteristics of senior bureaucrats, such as their years of schooling and tenure in the organisation;

(*ii*) the same characteristics for other bureaucrats; and

(*iii*) organisation characteristics, such as its average project completion rate, whether it is a decentralised body, the average budget and complexity of projects assigned to it.

Table 3 presents the results where two points are of note for the later interpretation of our key partial correlations between management and public service delivery.

First, the provision of incentives/monitoring is correlated with the education level of other bureaucrats. Second, average project completion rates do not predict management practices. This ameliorates some concerns over reverse causation from project

Table 3
Origins of Management Practices

Dependent variable: system of equations in autonomy and incentives/monitoring management scores
SUR model estimated by maximum likelihood
Robust standard errors

	CS-autonomy	CS-incentives/monitoring
Characteristics of senior management		
Average years of schooling	0.02	−0.02
	(0.18)	(0.18)
Average years in the organisation	0.02	−0.01
	(0.02)	(0.02)
Characteristics of other bureaucrats		
Average years of schooling	0.16	0.31**
	(0.14)	(0.14)
Average years in the organisation	0.00	0.00
	(0.02)	(0.02)
Average project completion rate	0.24	−0.21
	(0..17)	(0.17)
Decentralised organisation (yes = 1)	−0.03	0.32
	(0.22)	(0.22)
Average project budget	0.00	0.00
	(0.00)	(0.00)
Average project complexity	−0.01	−0.01
	(0.01)	(0.01)
Standard deviation of project complexity	0.02**	0.01
	(0.01)	(0.01)
Correlation of residuals in SURE system		0.2
Observations		63

Notes. *** Denotes significance at 1%, ** at 5%, and * at 10% level. Characteristics of management controls include the proportion of managers at an organisation who are male, the average level of seniority among management, the average years of schooling among managers, their average years of service and their average years at the organisation. Characteristics of non-managerial staff controls include the proportion of non-management staff at an organisation who are male, the average level of seniority among non-management, the average years of schooling amongst non-managers, their average years of service and their average years at the organisation. We follow the grading system of the Federal Government by defining senior bureaucrats as those on grade level 12 and above. Robust standard errors are in parentheses. Columns report maximum likelihood estimates to fit a SUR model for the two dimensions of management practice.

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completion rates and management practices. The evidence does not suggest that worse performing organisations end up providing more incentives/monitoring to their bureaucrats; nor does the evidence suggest better performing departments are associated with providing more autonomy to their bureaucrats.

2.4. *Empirical Method*

The empirical specification has as its unit of observation project i of type j in organisation n. Project types j are listed in Table 1 and organisations n are listed in Table A1. We estimate the following OLS specification, where y_{ijn} is the project completion rate, and management practices are measured using the CS-autonomy, CS-incentives/monitoring and CS-other indices:

$$y_{ijn} = \gamma_1 \, CS\text{-}autonomy_n + \gamma_2 \, CS\text{-}incentives/monitoring_n + \gamma_3 \, CS\text{-}other_n + \beta_1 PC_{ijn} + \beta_2 OC_n + \lambda_j + \varepsilon_{ijn}.$$

$$(1)$$

PC_{ijn} is a vector of project characteristics including project complexity, log project budget and whether the project is a rehabilitation or not. OC_n is a vector of organisational controls such as the log number of staff, log total organisation budget, log capital budget, and the proportions of officials with a college and postgraduate degree. Following BVR, within OC_n we also condition on 'noise' controls related to the management surveys.[15]

As many organisations implement project type j, we control for project type fixed effects λ_j in (1). The partial correlations of interest are γ_1 and γ_2: as each CS-measure is a standardised z-score, these coefficients measure the effect size of a one standard deviation change in management practices along the respective margins of autonomy and incentives/monitoring. We cluster standard errors by project type-organisation, and the online Appendix demonstrates the robustness of our results to allowing standard errors to be clustered by organisation and correcting p-values for potential biases due to a small number of clusters (Cameron *et al.*, 2008) (Table A5). Our working sample is based on 4,721 projects from 63 organisations on which we have data on management practices and project, organisation and bureaucrat characteristics.[16]

We are implicitly assuming that, within project type and controlling for project and organisational characteristics, the underlying production function is the same across projects. Specification (1) then corresponds to a reduced form representation of an underlying production function in which management practices convert the raw total of available bureaucratic labour into effective labour inputs in the completion of public

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[15] These include interviewer dummies, the seniority, gender and tenure of the managers who responded, the day of the week and time of day of the interview, whether the interview was conducted during Ramadan, the interview duration and an indicator of the reliability of the information as subjectively coded by the interviewer.

[16] Regressing project completion rates on organisational fixed effects yields an adjusted-R^2 of 0.32, suggesting that organisational characteristics such as management practices can plausibly play an important role in determining such outcomes. Regressing project completion rates on all project characteristics (including project fixed effects but not our CS-measures or organisation fixed effects), the adjusted-R^2 is 0.11. Additionally, controlling for organisation fixed effects, the adjusted-R^2 rises to 0.34. These last two results suggest that conditional on project characteristics, it remains true that some organisation level characteristics are important determinants of project completion rates.

projects. Along similar lines but in the context of profit maximising firms, Bloom *et al.*
(2014, 2015) formally develop and test the notion that management can be thought of as
a form of technology, thus explaining between firm variation in productivity.

3. Evidence

3.1. *Project Completion Rates*

Table 4 presents our main results on how management practices correlate with project
completion rates. Column (1) only controls for the three CS-measures. We find that
the practice of giving greater autonomy to bureaucrats is correlated with significantly
higher completion rates ($\hat{\gamma}_1 > 0$). The use of performance incentives/monitoring for
bureaucrats, however, significantly reduces project completion rates ($\hat{\gamma}_2 < 0$). Columns
(2)–(4) sequentially condition on noise controls and organisational characteristics,
project characteristics and project type fixed effects. Throughout, we find both
management practices remain significantly correlated with project completion rates.

Our preferred specification is in column (4) with project type fixed effects, λ_j. This
shows a one standard deviation increase in CS-autonomy corresponds to significantly
higher project completion rates of 18%. A one standard deviation increase in
CS-incentives/monitoring corresponds to significantly lower project completion rates
of 14%. In all specifications, better management practices on the CS-other dimension
are positively correlated with project completion rates; in column (4), the estimated
coefficient is indeed significant at conventional levels, although the effect size is
significantly smaller than for the two dimensions of management practice.

Taken together, this descriptive evidence suggests management practices in
bureaucracies can be importantly related to public service delivery in this kind of
developing country context. The earlier evidence from Table 3 on the origins of
management practices suggested the explanation for these partial correlations is not
entirely down to reverse causation (in that we did not find evidence for worse
performing organisations ending up providing more incentives/monitoring to their
bureaucrats, nor that better performing organisations ended up granting more
autonomy to their bureaucrats). To narrow down the factors that might drive the
documented partial correlations, in the online Appendix we present further evidence
on the processes assigning projects and bureaucrats to organisations. As far as the data
allow, we note how both processes are largely uncorrelated with the management
practices in place in organisations (Tables A6–A8).

Columns (5) and (6) in Table 4 consider alternative measures of the output of
bureaucracies. Column (5) focuses attention on how management practices correlate
with the extensive margin of projects being started (as Table 1 showed, 38% of projects
have a zero completion rate). Hence, the outcome considered is a dummy equal to one
if the project completion rate is strictly positive, and zero otherwise. We see that each
dimension of management practice has qualitatively similar correlation with whether
projects are started or not, as on the total project completion rate focused on in
columns (1)–(4). In column (6), we address the concern that projects may be almost
completed but to a low quality. We therefore construct a 'quality-adjusted' completion
rate where the proportion completed is multiplied by a binary quality indicator. Where

Table 4

Management Practices and Public Sector Service Delivery

Standard errors: clustered by project type within organisation

OLS estimates

	(1) Unconditional	(2) Organisation controls	(3) Project controls	(4) Project type fixed effects	(5) Binary project initiation	(6) Quality-adjusted completion rate
CS-autonomy	0.11**	0.18***	0.17***	0.18***	0.15***	0.11**
	(0.05)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
CS-incentives/monitoring	−0.06*	−0.11***	−0.11***	−0.14***	−0.16***	−0.08***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
CS-other	0.10***	0.05	0.05	0.08***	0.06**	0.08***
	(0.04)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)
Organisation controls (capital, general, noise)	No	Yes	Yes	Yes	Yes	Yes
Project controls	No	No	Yes	Yes	Yes	Yes
Fixed effects	None	None	None	Project type	Project type	Project type
Adjusted R²	0.07	0.29	0.29	0.32	0.36	0.17
Observations (clusters)	4,721	4,721	4,721	4,721	4,721	2,206
	(201)	(201)	(201)	(201)	(201)	(144)

Notes. *** Denotes significance at 1%, ** at 5%, and * at 10% level. Standard errors are in parentheses and are clustered by project type within organisation throughout. All columns report OLS estimates. The dependent variable in columns (1)–(4) and (6) is the proportion of the project completed (that is a continuous measure between zero and one). The dependent variable in column (5) is a binary measure of project initiation which takes the value 1 if the project is at least 1% complete and 0 otherwise. The dependent variable in column (6) is the product of the proportion completed variable and the dummy variable for quality. The sample of projects in column (6) is limited to those for which project completion and quality data are available. Project type fixed effects relate to whether the primary classification of the project is as a financial, training, advocacy, procurement, research, electrification, borehole, dam, building, canal or road project. Project controls comprise project-level controls for the project budget, whether the project is new or a rehabilitation and an assessment of its aggregate complexity by Nigerian engineers. Capital controls comprise organisation-level controls for the logs of number of employees, total budget and capital budget. General controls comprise organisation-level controls for the share of the workforce with degrees and the share of the workforce with postgraduate qualifications. Noise controls are four interviewer dummies, indicators of the seniority, gender, and tenure of the managers who responded, the day of the week the interview was conducted, the time of day the interview was conducted, a dummy variable indicating whether the interview was conducted during Ramadan, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer. Note that no quality information is available for organisations surveyed on a Saturday, and thus the dummy variable indicating a survey took place on a Saturday is omitted in column (6). Total and capital budget figures are an average of organisation budget figures for the years 2006–10. Figures are rounded to two decimal places.

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quality is unsatisfactory, whatever the level of completion, this variable is set to zero. As described in Section 2, information on project quality is only available for around half the projects for which we have project completion data, originating in 51 civil service organisations. Column (6) then shows the relationship between management practices and quality-adjusted project completion rates. We find the CS-measures to be associated with quality-adjusted project completion rates in a similar way to project completion rates: higher levels of CS-autonomy are correlated with significantly higher quality projects, and higher levels of CS-incentive/monitoring are correlated with significantly lower quality projects.

3.2. *Robustness Checks*

The online Appendix presents a series of robustness checks to examine the stability of our core finding in alternative samples, variable definitions and using alternative econometric methods.

We first restrict attention solely to borehole projects (that are the modal project type), and online Appendix Table A9 then replicates the sequence of specifications in Table 4. This shows that when only borehole projects are considered, the partial correlations of interest $(\hat{\gamma}_1, \hat{\gamma}_2)$ remain the same sign and significance as in our main specifications presented in Table 4. Hence, holding constant the production function for public projects, the two dimensions of management practice continue to correlate with project completion rates as in the main sample.

We next document the robustness of our baseline result along eight further margins (as shown in Table A10 and Figure A1):

  (*i*) defining threshold completion rates that deem the project usable and seeing how management practices relate to reaching these thresholds;
  (*ii*) restricting the sample to the largest/smallest organisations;
  (*iii*) removing organisations at the tails of the CS-measures;
  (*iv*) considering the partial correlations of managerial practices on construction/non-construction projects separately;
  (*v*) considering the partial correlations of managerial practices on projects implemented by centralised/decentralised organisations separately;
  (*vi*) controlling for characteristics of the state in which the project are located, and exploring how the results vary depending on whether projects are located in the North or South of the country that defines the principal cultural divide in Nigeria;
  (*vii*) alternative constructions of the CS-indices (rather than the equal weighting procedure); and
  (*viii*) using a fractional regression model.

Given there is no definitive way to group individual practices into management indices related to autonomy and incentives/monitoring, in online Appendix Table A11, we consider the robustness of our results to alternative groupings of practice into these two dimensions. We consider changes to both CS-indices, as well as considering an alternative breakdown of the CS-incentives/monitoring index, grouping practices that match more closely to input or output-based incentive measures. Taken together, the

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results show that small changes to the construction of management practice indices we focus on, does not change the substantive conclusions reached earlier from Table 4.

In online Appendix Table A12, we further examine the partial correlations of all nine dimensions of management practice with project completion rates. This reiterates that project completion rates robustly correlate with only the two dimensions focused on so far: autonomy and incentives/monitoring. This is reassuring as these are the two dimensions of management highlighted by the public administration and economics literatures. These are also the margins of management that current field experiments on bureaucracies seek to manipulate, as in Banerjee *et al.* (2014).

3.3. *Exploring the Negative Correlation with Incentives/Monitoring*

Our core results from Table 4 confirm that the two dimensions of management practice emphasised by the public administration and economics literatures, namely autonomy and incentives/monitoring, do indeed robustly correlate with the quantity and quality of public services delivered. The positive correlation of CS-autonomy with project completion rates supports the notion that public agencies could delegate some decision making to bureaucrats, relying on their professionalism and resolve to deliver public services. The evidence is less supportive of the notion that when bureaucrats have more agency, they are more likely to pursue their own, potentially corrupt, objectives that diverge from societal interests.

The robust negative correlation between project completion rates and management practices related to the provision of incentives and monitoring of bureaucrats, is far more surprising and counter to a large body of evidence from private sector settings. As described in the introduction, the evidence on the impacts of performance-related incentives in public sector settings is mixed (often focusing on the impacts of specific compensation schemes to frontline workers).[17] Ours is among the first evidence to suggest the possibility that such management practices negatively correlate with the output of the vital tier of civil service bureaucrats. Given the novelty and importance of this finding, we now investigate the result in more detail.

The detrimental impacts of such practices for bureaucrats might operate through at least three mechanisms. First, bureaucrats might operate in a multi-tasking environment, exerting some types of effort that can be labelled as 'processing', that do not lead to project completion rates, and also exerting more productive types of effort that raise completion rates. Our management practice measure might then capture an incentive system that places excessive regulatory burden or 'red tape' on bureaucrats that has long been argued to lead bureaucrats to mis-allocate effort towards processing activities (Kelman, 1990). Alternatively, our management practices related to incentives/monitoring might pick up SPE. While SPE has the benefit of being based on a more rounded set of assessments, such subjective assessments also give rise to other

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[17] In health, two recent Cochrane reviews have come to different conclusions on the efficacy of pay for performance (Flodgren *et al.*, 2011; Scott *et al.*, 2011). Perry *et al.* (2009) review 57 studies on pay for performance in the public sector and conclude 'pay-for-performance continues to be adopted but persistently fails to deliver'. Hasnain *et al.* (2012) review over 60 public sector studies and find the vast majority are for tasks where outputs are more easily measurable such as teachers, health workers and revenue inspectors. They argue there is simply insufficient evidence of the impact of incentives on bureaucrats.

biases and dysfunctional responses, especially the desire of agents to engage in influencing activities to curry favour with supervisors (Milgrom, 1988; Milgrom and Roberts, 1988). If so, the increased use of such mistargeted incentives and key performance indicators can also lead to bureaucrats reallocating effort towards non-productive tasks, reducing project completion rates. Finally, performance incentives might crowd out the intrinsic motivation of bureaucrats (Perry and Wise, 1990; Benabou and Tirole, 2003; Francois and Vlassopoulos, 2008).[18]

3.3.1. *Multi-tasking and incentive design*

We use three strategies to investigate this channel. We first check whether the partial correlation of incentives/monitoring practices with project completion rates varies with the complexity of projects, assuming:

  (*i*) more complex projects require more varied effort types to be exerted; and
  (*ii*) incentives are harder to design for such projects, all else equal.

Column (1) in Table 5 interacts the CS-incentives/monitoring measure with the continuous measure of project complexity. For expositional ease, this interaction term is defined in terms of its deviation from mean, so the coefficients on CS-autonomy and CS-incentives/monitoring are interpreted as the marginal effect of these practices, evaluated at the mean of project complexity. We see the negative correlation of CS-incentives/monitoring practices for bureaucrats is exacerbated in more complex projects, in line with a multi-tasking interpretation.

Our second approach to understanding whether incentive/monitoring schemes might be poorly designed in this setting uses the intuition that if the negative correlation of incentives/monitoring reflects the inability of organisations to correctly target such incentives to the relevant types of bureaucrat effort, this problem might be ameliorated in organisations with better IT facilities, who presumably have better capability to objectively measure effort types (Bloom *et al.*, 2012*b*). To explore this, we interact our CS-incentives measure with the CS-facilities dimension of management practice: as Table A4 shows, this relates to the availability of computing facilities at the organisation. In this specification, we redefine CS-other to exclude the CS-facilities component. The result in column (2) of Table 5 indeed shows the partial correlation of CS-incentives to be significantly less negative in organisations with better IT facilities. Moreover, there is no significant levels impact of CS-facilities: the provision/ accessibility of IT facilities for bureaucrats only seem to matter in combination with management practices related to incentives/monitoring.

A third approach to examine the role multi-tasking might play exploits information on the inherent riskiness/ambiguity of projects as embodied in their technical specifications. Incentives/monitoring practices might be harder to tailor for more ambiguously designed projects, all else equal. To explore this, we consider projects of

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[18] Baker (2002) develops a multi-tasking model to characterise how distortion and risk affect the value and use of performance measures. The model highlights how in public bureaucracies that cannot use stock incentives and have nebulous objective functions, leading to a fundamental difficulty in defining 'good' performance measures. Hence, the potential for dysfunctional responses when high-powered incentives are utilised in such settings.

Table 5

Heterogeneous Correlations of Management Practices Related to Incentives and Monitoring

Dependent variable: project completion rate
Standard errors: clustered by project type within organisation
Interactions in deviation from mean
OLS estimates

	(1) Project complexity	(2) Facilities	(3) Tenure	(4) Intrinsic motivation	(5) Observe corrupt practices
CS-autonomy	0.19*** (0.03)	0.20*** (0.03)	0.19*** (0.02)	0.21*** (0.03)	0.17*** (0.03)
CS-incentives/monitoring	−0.15*** (0.02)	−0.14*** (0.02)	−0.10*** (0.03)	−0.17*** (0.02)	−0.15*** (0.02)
CS-other	0.08*** (0.02)		0.06** (0.03)	0.07*** (0.02)	0.08*** (0.03)
CS-incentives/monitoring × project complexity	−0.19*** (0.06)				
CS-incentives/monitoring × CS-facilities		0.03* (0.02)			
CS-other (without facilities)		0.09*** (0.03)			
CS-facilities		0.01 (0.02)			
CS-incentives/monitoring × average tenure of bureaucrats			−0.03*** (0.008)		
CS-incentives/monitoring × proportion of bureaucrats intrinsically motivated				0.54** (0.22)	
CS-autonomy × proportion of projects that bureaucrats report observing corrupt practices on					0.35 (0.23)
CS-incentives/monitoring × proportion of projects that bureaucrats report observing corrupt practices on					0.27 (0.27)
Project complexity	−0.01 (0.11)				
Average tenure of bureaucrats			−0.01 (0.01)		
Proportion of bureaucrats intrinsically motivated				−0.47 (0.31)	

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Table 5
(*Continued*)

Dependent variable: project completion rate
Standard errors: clustered by project type within organisation
Interactions in deviation from mean
OLS estimates

	(1) Project complexity	(2) Facilities	(3) Tenure	(4) Intrinsic motivation	(5) Observe corrupt practices
Proportion of projects that bureaucrats report observing corrupt practices on					−0.94*** (0.36)
Organisation controls (capital, general, noise)	Yes	Yes	Yes	Yes	Yes
Project controls	Yes	Yes	Yes	Yes	Yes
Fixed effects	Project type	Project type	Project type	Project type	Project type
Adjusted R^2	0.33	0.32	0.33	0.32	0.33
Observations (clusters)	4,721 (201)	4,721 (201)	4,721 (201)	4,721 (201)	4,721 (201)

Notes. *** Denotes significance at 1%, ** at 5% and * at 10% level. Standard errors are in parentheses and are clustered by project type within organisation throughout. All columns report OLS estimates. The dependent variable is the proportion of the project completed (that is a continuous measure between zero and one). Project type fixed effects relate to whether the primary classification of the project is as a financial, training, advocacy, procurement, research, electrification, borehole, dam, building, canal or road project. Project controls comprise project-level controls for the project budget, whether the project is new or a rehabilitation and an assessment of its aggregate complexity by Nigerian engineers. Capital controls comprise organisation-level controls for the logs of number of employees, total budget and capital budget. General controls comprise organisation-level controls for the share of the workforce with degrees and the share of the workforce with postgraduate qualifications. Noise controls are four interviewer dummies, indicators of the seniority, gender and tenure of the managers who responded, the day of the week the interview was conducted, the time of day the interview was conducted, a dummy variable indicating whether the interview was conducted during Ramadan, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer. Total and capital budget figures are an average of organisation budget figures for the years 2006–10. In column (1), the aggregate complexity is a project-level subjective assessment by Nigerian engineers of the relative difficulty of the project within the population of OPEN projects. In column (3), tenure is an organisation-level average for the number of years officials have worked at the implementing organisation. In column (4), intrinsic motivation is an organisation-level proportion of employees at an organisation that answered 'The chance to serve Nigeria' to the question 'What most influenced you to take up a career in the service?' in the Civil Servants Survey. In column (5), observation of corrupt practices is an organisation-level average of the proportion of projects officials at an organisation stated on which 'I observed others breaking the service rules for their own benefit' in the Civil Servants Survey. Figures are rounded to two decimal places.

different types j to be of systematically different design ambiguity, and proceed in two steps. First, we measure this design ambiguity using subcomponents of the complexity indicator described in Table A4. We construct a z-score based on the design uncertainty, implementation uncertainty, design ambiguity and implementation ambiguity components of the project complexity metric. Denote the average ambiguity of projects of type j by $\overline{\sigma}_j$. We then estimate a specification analogous to (1) for a given project type j (excluding project type fixed effects). In our sample, there are sufficient numbers of projects implemented across different organisations to estimate this for five project types: boreholes, buildings, dams, procurement and training. For each project type j, we then obtain an estimate of the partial correlation between CS-incentives and project completion rates, $\hat{\gamma}_{2j}$, conditional on CS-autonomy. Figure 1 plots the five $(\hat{\gamma}_{2j}, \overline{\sigma}_j)$ pairs, as well as a cubic best fit.

The evidence suggests the negative correlation of incentives/monitoring practices on project completion rates is worse for projects with greater inherent design ambiguity.[19] Projects with the greatest design ambiguities might be those for which incentives/monitoring schemes are hardest to tailor and so elicit the most dysfunctional responses from bureaucrats. The heterogenous correlations documented across project types in Figure 1 also provides an explanation of why there are such mixed empirical findings in the literature on the impact of incentive provision in public sector settings: different studies might have considered projects/tasks of differing complexity and design ambiguity. Finally, we note the average ambiguity of project types $\overline{\sigma}_j$ correlates with the proportions of those projects that have completion rates of zero: this suggests bureaucrats might simply shy away from implementing the most ambiguously designed projects to begin with.
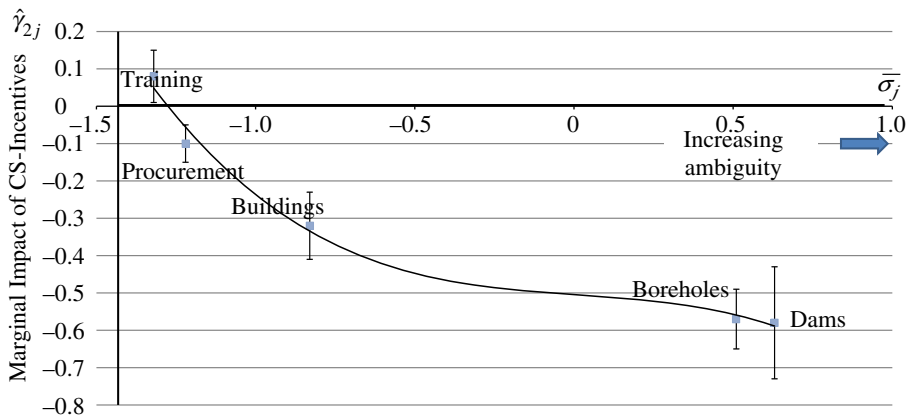

Fig. 1. *Project Ambiguity and CS-incentive/Monitoring Management Practices*
Notes. The horizontal axis measures the ambiguity of projects of a given type. We measure this design ambiguity using subcomponents of the complexity indicator described in Table A3. In particular we construct a z-score based on the design uncertainty. Colour figure can be viewed at wileyonlinelibrary.com.

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[19] Given the CS-performance and CS-autonomy are positively correlated and have opposite signed impacts on project completion rates, this negative relationship between risk/uncertainty and incentives would be attenuated if we do not control for CS-autonomy when estimating $\hat{\gamma}_{2j}$ (Prendergast, 2002).

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3.3.2. *SPE and intrinsic motivation*

To shed light on the plausibility of these channels driving the negative correlation between project completion and incentives/monitoring practices, we consider how these practices interplay with bureaucrat characteristics, as measured through the survey we administered to a representative sample of officials at each organisation. As described in Section 1, Nigerian bureaucrats enjoy long tenure. On the one hand, longer serving bureaucrats might learn how best to respond to incentives by exploiting other flexibilities. On the other hand, if bureaucrats are subject to SPE, they might learn how best to engage in influence activities. To check for this, column (3) in Table 5 controls for an interaction between the average tenure of bureaucrats in the organisation (in deviation from mean) with the CS-incentives/monitoring measure, as well as the direct effect of tenure. We find the negative correlation of incentives/monitoring to be even more negative in organisations staffed by more experienced bureaucrats, consistent with bureaucrats learning how to engage in influence activities. We also note there is no direct levels effect of average tenure on project completion rates, so that it is not the case that bureaucrats naturally reduce effort over time as they become embedded within long-standing norms of poor standards in civil service organisations. Rather, there appears to be a specific interplay between bureaucrat tenure and incentives/monitoring practices for bureaucrats.

A burgeoning literature suggests those attracted to public service might be relatively more intrinsically motivated than those working in the private sector. Performance incentives might then be detrimental if they crowd out such intrinsic motivation. To measure civil servant's intrinsic motivation, we asked bureaucrats which factor that had most influenced them to originally enter the civil service from the following options: 'I was interested in the type of work', 'income prospects', 'the prestige associated with such a job', 'the stable career path that a job in the service affords', 'the chance to serve Nigeria', 'it was the only employment I could get', 'educational opportunities', 'other'. We define those that answered, 'the chance to serve Nigeria' as being intrinsically motivated. Roughly, a third of officials state that they entered the civil service to serve Nigeria. For each organisation, we then construct the fraction of intrinsically motivated bureaucrats.[20]

Column (4) shows how the partial correlation of CS-incentives/monitoring with project completion rates varies by the intrinsic motivation of bureaucrats. The previously documented negative correlation of such practices is significantly offset when a greater share of bureaucrats are themselves intrinsically motivated. This runs counter to the notion that incentive provision crowds out efforts of intrinsically

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[20] In the public administration literature, public service motivation is usually measured using the scale developed in Perry (1996), based on statements related to politics, public service and pro-social activities. This is the approach also followed in Dal Bo *et al.* (2013). Alternative approaches employed in the economics literature include:

(*i*) dictator games to examine how many resources an individual transfers to a pro-social task (Ashraf *et al.*, 2014); and
(*ii*) charitable contributions (Buurman *et al.*, 2012).

In our civil servant survey, 'the chance to serve Nigeria' was the modal answer given. The other two most frequent reasons were 'I was interested in the type of work' and 'the stable career path that a job in the service affords', that were each given by around 20% of individuals

motivated individuals: if anything, as in Ashraf *et al.* (2014), our evidence suggests incentives/monitoring crowd-in the effort of intrinsically motivated bureaucrats. If our CS-incentives/monitoring measure captures SPE being in place for bureaucrats, the result further highlights that intrinsically motivated bureaucrats exert more productive efforts in organisations where such SPE are utilised to a greater extent, rather than engaging in influence activities, say.[21]

3.3.3. Corruption

While the recent economics literature has emphasised the importance of the intrinsic motivation of bureaucrats, a long-standing literature in public administration emphasises that civil servants might pursue their own self-interest (Wilson, 1989). This more negative view of bureaucrats spurs our final set of descriptive results that explore how the correlations between project completion rates and incentives/monitoring are mediated through perceptions of corruption among civil service organisations. Corruption in public bureaucracies is a first-order issue in Nigeria and in many countries at similar stages of development (although the fact that 31% of projects are completed fully also suggests corruption is not all pervasive).

To elicit information on perceptions of corruption, we began by discussing vignettes with bureaucrats, then made those scenarios closer to the bureaucrat's actual situation and, finally, asked individuals about their own observations and experiences of corruption. We asked on what proportion of recent projects the official had worked, did they observe 'others breaking service rules for their own benefit'. On average, officials stated that on 38% of projects, such observations of corrupt practice had been made, that, by chance, coincides with the proportion of projects with a zero completion rate. We aggregate this to the organisation level to construct the proportion of projects bureaucrats report having observed corrupt practices on.[22]

Column (5) shows how the partial correlations of both dimensions of management practice vary by perceptions of corruption among bureaucrats. To begin with, we note the robust negative levels correlation of our corruption measure on project completion

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[21] We have explored whether there are within-sample values of the interactions at which the marginal effect of CS-performance is positive. Generally, this is not the case: even for the least complex projects or the most IT advanced organisations, the marginal correlation of management practices related to incentives/monitoring is negative. For completeness, we have also explored the heterogeneous correlations of management practices related to autonomy. We place less attention on these findings because theory offers less guidance for such an analysis. In general, the correlations of management practices related to autonomy are homogeneous. They do not significantly vary with project complexity, non-modal project types, or bureaucratic tenure We do find the positive impacts of autonomy to be significantly higher when a greater proportion of bureaucrats report being intrinsically motivated. We leave for future research the exploration of such heterogeneous impacts.

[22] We also asked whether officials had themselves been put under pressure to:

  (*i*) change the project location;
  (*ii*) change project specifications;
  (*iii*) help select particular contractors/suppliers/consultants; and
  (*iv*) divert some of the funds.

Aggregating responses into an organisational average, officials stated that they had experienced such pressures on 19% of projects. We prefer to use the measure related to observed corrupt practices over this measure because officials are obviously cautious when potentially incriminating themselves.

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rates. This affirms that the measure captures some element of civil servant behaviour that is deleterious for public service delivery. However, we see that the marginal correlation of granting bureaucrats autonomy does not vary with the prevalence of corrupt behaviour, and similarly, the negative marginal correlation of incentives/ monitoring also does not significantly vary with perceptions of corruption among bureaucrats. In short, the evidence suggests that corruption has a direct and quantitatively large negative correlation with project completion rates but there are few bureaucrats on the margin of being prevented from behaving corruptly because of incremental changes in management practice. Of course, this finding is specific to this context and is true for the types of relatively small-scale rural infrastructure projects we consider (whose average budget is below $100,000). The interplay between corruption and management practices for bureaucrats on larger budget projects remains open to study for future research.

4. Discussion

4.1. *Optimising Management Practices*

Our results naturally beg the question of why civil service organisations might not be optimising over management practices to begin with. In our context, a fundamental source of this inefficiency arises from organisations being tasked to implement many different types of project (Table 2). As Figure 1 highlights, project types have very different characteristics and so it is unlikely that there exists a unique set of optimal management practices any organisation could have in place.

As discussed by BVR for private sector firms, suboptimal management practices might also persist in equilibrium because:

(*i*) there are large fixed costs of adopting better practices; and
(*ii*) best management practices might be heterogeneous across organisations.

While little can be said on the first point using our available data, the second point might be relevant given the results on the heterogeneous correlations between management practices and project completion rates in Table 5. Those results imply the optimal incentives/monitoring practices in place might need to reflect the complexity and ambiguity of projects in an organisation's portfolio, the use of IT facilities, as well as the tenure and intrinsic motivation of its bureaucrats. However, these issues were not at the fore during the semi-structured interviews we conducted at organisations to understand what drives management practices in reality. These all highlighted how practices evolve slowly over time as a function of ground rules laid out in the Public Service Rules of the Nigerian civil service, the history of senior management staff, and trade union demands. As further discussed in BVR, inefficient management practices might also persist for dynamic reasons: learning and adjustment costs might cause best practice to diffuse over time. This is in line with the evidence in Table 3 and discussed throughout on the frictions in the labour market for bureaucrats, limiting their mobility across organisations. Finally, a particularly acute concern is that a lack of competitive pressure enables poorly managed public sector organisations to survive. This might especially be true in

developing country contexts where mechanisms are rarely in place to allow citizens to choose across alternative public providers of a given good or service, an issue we return to below.[23]

An alternative explanation why bureaucracies do not appear to optimise management practices is based on a Weberian view: organisations do optimise management practices according to their true objective; our evidence merely suggests this objective is weakly aligned with maximising project completion rates.[24] To investigate this, we use data from our civil servant survey to check whether management practices correlate with the frequency with which bureaucrats report engaging with politicians and community groups. More precisely, we asked bureaucrats the proportion of projects they engaged with politicians from the National Assembly, with politicians from the State Parliament, with chairmen of local government, and with community/religious groups. With the unit of observation being each bureaucrat's report, we estimate whether this correlates with the CS-measures, conditional on bureaucrat and organisation characteristics, and bureaucratic-grade fixed effects. We run each specification separately for manager and non-manager bureaucrats (managers are those at or above grade 12).

Table 6 presents the results, showing that:

  (i) management practices related to autonomy are weakly correlated with bureaucratic engagements with politicians/other groups;
  (ii) incentives/monitoring of bureaucrat correlate with significantly more engagement with national and state politicians, local government chairman, and community/religious groups; and
  (iii) this second effect exists only for sufficiently high bureaucratic grades (managers).

The results might indicate incentives/monitoring practices skew senior bureaucrat's effort away from activities leading to project completion towards engaging with politicians, in line with the earlier interpretation of incentives being poorly tailored in this setting. Alternatively, if engagement with politicians enables project completion rates to rise, all else equal, the results would imply incentives/monitoring practices are well designed in this context after all. However, the fact that providing bureaucrats more autonomy does not lead them to engage more with politicians leans towards the first interpretation. Collecting more detailed time use data for bureaucrats remains an important avenue for future research.[25]

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[23] In the private sector, Bloom *et al.* (2012*a*) provide evidence that product market competition drives innovations towards more better management practices. Bloom *et al.* (2014, 2015) find evidence that hospitals that face competition for patients from rival hospitals do indeed adopt better management practices.

[24] To further assess the degree of alignment in organisational objectives with project completion rates, we regressed the log of project budgets on each of the 16 subcomponents of the project complexity indicator, as shown in Table A3. The residuals from this regression, that might capture the rents to be gained from the project if it is completed, are found to be weakly positively correlated with actual project completion rates, with a correlation of 0.13.

[25] Bureaucrats report engaging with national politicians on 12% of projects. The corresponding figures for the other groups are 7% for state politicians, 13% for local government chairmen and 24% with community groups.

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Table 6

Bureaucrat's Engagement with Politicians and Management Practices

Robust standard errors
OLS estimates

	Engagement with national parliamentary politicians		Engagement with state parliamentary politicians		Engagement with Local Government Chairmen		Engagement with Community/Religious Groups	
	(1a) Managers	(1b) Non managers	(2a) Managers	(2b) Non managers	(3a) Managers	(3b) Non managers	(4a) Managers	(4b) Non managers
CS-autonomy	0.19	0.34	0.04	0.52	1.98*	1.49	1.08	−0.35
	(1.05)	(0.89)	(0.68)	(0.76)	(1.10)	(0.96)	(1.36)	(1.17)
CS-incentives/monitoring	3.49**	−2.46**	3.61***	−0.43	3.79***	−0.32	3.68**	−1.67
	(1.39)	(1.19)	(1.06)	(0.89)	(1.44)	(1.30)	(1.67)	(1.53)
CS-other	1.03	1.06	−0.17	0.34	0.19	1.14	0.79	2.84**
	(1.09)	(0.95)	(0.73)	(0.88)	(1.20)	(1.22)	(1.51)	(1.41)
Organisation controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bureaucrat controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects (bureaucrat grade)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.08	0.04	0.02	0.02	0.07	0.06	0.06	0.06
Observations	1,175	1,184	1,130	1,122	1,140	1,131	1,192	1,202

Notes. *** Denotes significance at 1%, ** at 5%, and * at 10% level. Robust standard errors are in parentheses. All columns report OLS estimates. The dependent variable in columns (1a) and (1b) is the proportion of projects a bureaucrat personally engages with a national parliamentary politician on. The dependent variable in columns (2a) and (2b) is the proportion of projects a bureaucrat personally engages with a state parliamentary politician on. The dependent variable in columns (3a) and (3b) is the proportion of projects a bureaucrat personally engages with a local government chairman on. The dependent variable in columns (4a) and (4b) is the proportion of projects a bureaucrat personally engages with a community or religious group on. Managers are those at or above grade 12. Bureaucratic tier fixed effects relate to the grade of a bureaucrat, reflecting the seniority of that bureaucrat in the civil service. Capital controls comprise organisation-level controls for the logs of number of employees, total budget, and capital budget. General controls comprise organisation-level controls for the share of the workforce with degrees, and the share of the workforce with postgraduate qualifications. Noise controls are four interviewer dummies, indicators of the seniority, gender, and tenure of the managers who responded, the day of the week the interview was conducted, the time of day the interview was conducted, a dummy variable indicating whether the interview was conducted during Ramadan, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer. Total and capital budget figures are an average of organisation budget figures for the years 2006–10. Figures are rounded to two decimal places.

4.2. *Methodological Issues and Politics*

We add to a nascent literature attempting to measure management practices outside of the private sector.[26] We fully recognise the scope for future work to investigate the precise dimensions of management practice most relevant in bureaucracies, and design questions that can best help to build indices of these measures. Perhaps, part of the issues will become more settled as further work is conducted to understand whether management is best thought of as a technology and input into the production process (Bloom *et al.*, 2014, 2015) so that some practices can be thought of as inherently good or bad, or whether it is a form of organisational design where differences in practices are styles optimised by each organisation (Gibbons and Roberts, 2013).

Moreover, future work on the study of bureaucracies needs to integrate in an analysis of political factors – such as measuring the 'political will' to complete specific projects, identifying informal incentives politicians provide bureaucrats (say through patronage), and better understanding the conflict politicians face in providing bureaucrats autonomy *versus* their desire to retain political control of public service delivery. All such factors likely interplay with the management practices bureaucrats operate under. Rogger (2014) takes a first step in this direction, using the OPEN data to investigate the extent to which political interference in the bureaucracy explains the productivity of bureaucratic organisations. He finds that while political interference is certainly an important feature of the Nigerian civil service, it is unrelated to management practices: rather it is driven by the political competition politicians face.

5. Conclusion

We provide among the first large-scale descriptive evidence on whether the management practices bureaucrats operate under, correlate with the quantity and quality of public services delivered. We present a body of evidence that starts to fill an important knowledge gap, linking the management practices the vital middle-tier of civil service bureaucrats are subject to, and public service delivery. We do so in the context of an important developing country, Nigeria, and at a time when many developing countries are engaged in reforming bureaucracies in line with the 'good governance' agenda of the World Bank and United Nations (Goldfinch *et al.*, 2012; Hasnain *et al.*, 2012).

Our results confirm that two dimensions of management practice emphasised by the public administration and economics literatures: autonomy and incentives/monitoring, robustly correlate with the quantity and quality of public services delivered. Our findings provide support to the notion that public agencies might delegate some decision making to bureaucrats (Simon, 1983), at least for the types of small-scale rural infrastructure project we mostly consider. We also provide suggestive evidence in line with interpretations of why management practices related to incentives/monitoring have detrimental impacts in this setting: bureaucrats operate in a multi-tasking

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[26] For example, Bloom *et al.* (2014, 2015) study management practices in UK hospitals. In education, McCormack *et al.* (2013) have measured management practices in nearly 250 departments from 112 UK universities, and Di Liberto *et al.* (2013) measured management practices in schools in six industrialised countries (they extend BVR to also cover practices related to leadership).

environment, and these management practices pick up elements of SPE, that lead to other dysfunctional responses among bureaucrats. As such, our results sound a word of caution to the good governance agenda: the simple import of incentive/monitoring practices from the private sector might backfire in bureaucratic settings.

An obvious next step is to use field experiments to manipulate practices along both dimensions. While there is a rich body of literature in economics examining the design of incentives and use of monitoring technologies to build on, there remains much scope for thinking through precisely how autonomy/decision rights within organisations can be reallocated. A wider challenge for future experiments aiming to vary the autonomy of bureaucrats exogenously is that if individuals have a lure for authority (Fehr *et al.*, 2013), then the reallocation of power such changes to autonomy necessarily imply, will naturally lead to some constituencies of bureaucrats having incentives to block internally or undermine such changes in practice, as found in Banerjee *et al.* (2014).

The contours of a rich future agenda for understanding public service delivery (in rich and poor countries) are beginning to emerge, linking management practices for bureaucrats, selection/retention policies for bureaucrats (Dal Bo *et al.*, 2013), and mechanisms/incentives for the public and politicians to hold public sector organisations accountable (Besley and Burgess, 2002; Olken, 2007; Ferraz and Finan, 2008). Our contribution is to open the black box of the economic forces correlating with the behaviour of the vital middle-tier of civil service bureaucrats (as distinct from politicians and frontline workers that the literature has previously studied). We hope our analysis spurs methodological advancements in how to measure management practices in bureaucracies, and encourages researchers to design interventions where such practices are experimentally manipulated, as well as other features of bureaucrats' work environment.

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Additional Supporting Information may be found in the online version of this article:

Appendix A. Further Data Description and Robustness Checks.
Data S1.

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