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*Electrifying the base? Aid and incumbent advantage in Ghana**

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ABSTRACT

In 1999, the year before Ghana's 2000 election, the country experienced a large, unexpected decline in aid. The incumbent National Democratic Congress (NDC) lost the election. Did the decline in aid hurt the NDC at the polls, or was it simply incidental? Using data from a national, World Bank-funded electrification project, this article shows that the NDC was able to allocate aid according to explicitly political criteria. The article also exploits a quasi-experiment in aid disbursements to show that electrification caused NDC voting to increase in the constituencies that received electrification. Pre-electoral aid fluctuations exert a modest but measurable force on voting patterns. These findings add weight to calls for donors to coordinate to reduce aid volatility. They also show that incumbent governments can allocate aid strategically to secure votes, even under the best-case scenario of strict donor monitoring in an established democracy.

INTRODUCTION

Many African governments annually receive large volumes of foreign assistance. In many countries, this aid is as large as, or larger than, the domestically funded part of the state's development budget. In 2009, for example, net Official Development Assistance (ODA) was 102% of

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Burkina Faso's total central government expenditure. In the same year, this proportion was 82% for Uganda, 33% for Ghana and 105% for Sierra Leone (World Bank 2011). Aid flows are not only large but also fickle, with annual aid disbursements being far more volatile than domestically raised tax revenue (Bulír & Hamann 2008). Studies of African elections confirm suspicions that state resources can influence voting patterns (Nugent 2001; Wantchekon 2003), and there is broad agreement that 'in most African countries, the incumbents certainly enjoyed an enormous advantage by virtue of their control of the financial purse-strings' (Nugent 2007: 253). If state resources influence elections, and foreign donors often spend more in countries than the recipient government, then why is there not more concern over the influence of aid resources on incumbent advantage in Africa?

The answer to this question is generally an assertion that foreign aid is highly controlled or monitored by donors. There is a widely held belief that 'bankrupt governments whose development policy-making process is micro-managed by donors do not... have much discretion in the allocation of social services and new patronage' (van de Walle 2007: 65–6). Collier (2006), for example, referred to aid as a source of 'scrutinised revenues' that are substantially different from unscrutinised revenues (or 'sovereign rents') such as oil payments. Yet as the evidence in this paper makes clear, this view is, at best, incomplete. A more comprehensive view should acknowledge that African governments frequently have a great deal of discretion in allocating aid-funded social services as patronage. Politicians can affect the disbursement of aid, like other resources, in a strategic manner, and this can influence voting.

This paper uses a unique dataset on aid disbursements for electrification before Ghana's 2000 election. It demonstrates that Ghana's NDC government was able to target World Bank and bilateral assistance for electrification to the parts of the country that supported it politically. It also shows that the NDC benefitted electorally from this strategy. The paper is organised as follows. The next section provides a brief overview of Ghana's recent electoral history, showing that it is reasonable to assert that foreign resources helped the NDC stay in power. The paper then presents a model of how the NDC might seek to allocate aid, followed by the empirical results. In the conclusion, I argue that given the NDC's ability to direct aid flows, and its ability to win votes with these aid flows, the decline of aid in 1999 hurt the NDC's chances of victory in the 2000 election.

If governments can use aid to help win elections, it follows that donors can influence an incumbent's chance of re-election by over- or under-disbursing aid.

GHANA'S ELECTORAL HISTORY AND INFRASTRUCTURE SPENDING

In 1992, the exiting regime of Flight Lt Jerry Rawlings held Ghana's first multiparty elections since the elections of the brief Third Republic in 1979. Though the opposition alleged foul play in 1992 and boycotted the parliamentary elections, outside observers generally judged the election to have been fair (Jeffries & Thomas 1993). The next election, in 1996, returned the NDC and Rawlings to power. These elections were not boycotted and were even fairer than those in 1992 (Jeffries 1998). When his term expired in 2000, Rawlings stepped aside and John Atta Mills ran for the NDC. The 2000 election was Ghana's first experience of electoral turnover, with John A. Kufuor of the New Patriotic Party (NPP) winning in a run-off.

Ghana's voting patterns remained relatively stable throughout the 1990s and into the 2000s (Fridy 2007; Jeffries & Thomas 1993; Nugent 1999).[1] The NPP, which is generally regarded as the more conservative party, tended to do better in urban areas and around Kumasi. The NDC did better in rural areas, the national periphery, and especially in southern Volta Region, which votes so consistently for the NDC that it is known as their 'World Bank' of votes.[2] The NDC's popularity in poor and marginal areas is likely to be due to a combination of pro-poor national policies and the extension of infrastructure and social services to previously neglected areas of Ghana.

Before the 1992 election, Ghana's most important economic policy was its structural adjustment programme (SAP), which started in 1983 and was quite successful, as GDP growth between 1983 and 1992 averaged 5% per year and inflation fell from 122% in 1983 to 10% in 1992 (Bawumia 1998). The SAP was broadly pro-poor and pro-rural, as it boosted agricultural earnings while concentrating costs on cities. One example of this is the change in the ratio of urban to rural consumer prices, which increased from 0·83:1 in 1983 to 1·02:1 in 1991 (*ibid.*: 59). Rural Ghanaians also benefited from the SAP's provisions for the construction of infrastructure, including roads, water and electrification (Bawumia 1998; Herbst 1993; Tabatabai 1986).[3] Paul Nugent (1999; 2001; 2007) has argued that the NDC timed the provision of electrification projects and roads to occur before elections, and that this strategy helped the NDC in 1992 and 1996.

In 1996, the NDC strengthened its emphasis on infrastructure provision. This was most obvious in its campaign advertising, which included billboards with the slogan 'Always for people, always for development', beside a picture of a rural area with paved roads and electric poles (Roberts 1996). This imagery probably resonated because of the NDC's 'undeniable progress in bringing electricity, water, and roads to many rural areas over the years' (*ibid.*: 7). A reporter for *The Chronicle* (2000) summarised the situation thus:

> You see the period preceding the 1996 elections was the best for the rural folks. For the first time in decades, they began to feel that they were also 'somebodies'. They were getting KVIPs, electricity, water and roads (though most are impassable now). The money was there too, thanks to the World Bank and the IMF. The farmers were also getting relatively better price [*sic*] for cocoa. In short, the rural people were comparatively 'better off' than their urban counterparts who were struggling seriously to make ends meet.

One author looked back on the 1990s and referred to the NDC's political use of development projects as their 'development project vote-buying game' (Aubynn 2002: 97). In 1997, one year after the election, aid inflows to Ghana amounted to about half of total investment (Leite *et al.* 1999: 16).

The NDC tried to play the same game before the 2000 election, but found that they were heavily constrained by two shifts. First, in 1999 the government experienced a terms-of-trade shock, as the prices for cocoa and gold fell while the price of oil rose. In 1999, the government's cocoa duties were 150 billion cedi lower than the previous year, and 100 billion cedi lower than expected (Government of Ghana 2000). At the same time, the government also received 40 billion cedi (US$11 million) less than expected in grants and 235 billion cedi (US$67 million) less than expected in project aid.[4] This meant that in 1999, about a quarter of committed project aid and 10% of grants were never disbursed. At the time Ghana was highly aid-dependent, with foreign aid in 2001 equalling 64% of government expenditure (World Bank 2011).[5] Victor Selormey, the deputy minister of finance, addressed parliament on the state of the economy on 27 October 1999. While his comments were on the general state of the economy, it was 'the absence of donor funding that was at the heart of the minister's speech', during which he claimed that less than 30% of the aid that was committed to Ghana had been disbursed (EIU 2000: 17). Looking back, we can see that total ODA to Ghana declined from US$972 million at 2009 value in 1998 to US$825 million in 1999 (World Bank 2012).[6] These reductions in revenue and support led to declines in the provision of services and

infrastructure. Mr Selormey's 27 October speech announced a 17% downwards revision of the government's discretionary spending, which included nearly all development projects. An IMF report from November 1999 notes that 'the delays and shortfalls in external assistance in 1999 and deterioration in terms of trade by over 13% in 2000 substantially changed the medium-term outlook' (Leite *et al.* 1999: 49). The World Bank (2000a: 2) also noted that 'external budgetary support [in 1999] was well below expected levels'. Notably, neither multilateral donors nor any other consulted source ascribed any intentionality to the aid reduction, and in many ways Ghana was a star recipient. Instead, the aid reduction seems to be a clear case of volatility in the aid system, resulting in a large drop in resources to Ghana. Looking back on 1999, the 2000 budget statement reveals that the decline in discretionary spending was real, and much larger than the earlier estimate of 17% (Government of Ghana 2000: 16):

> When expenditures had to be restrained as a result of unfavourable fiscal conditions, it was those items that were considered purely discretionary that were affected, namely, service and investment expenditures. In spite of this, not less than 60% of total estimates for those expenditure items were released to MDAs.

The NDC did not shy away from trumpeting the public works that it commissioned before the 2000 election, but unlike the previous elections, there simply was not that much to boast about (Gyimah-Boadi 2001: 106).

In order to evaluate what might have happened had more aid been disbursed, it is necessary to examine both the *discretion* that the NDC had in allocating donor funds, and the *effect* that donor-funded projects had on vote patterns in the 2000 election. If we are confident that the NDC had a large amount of discretion over aid allocation and that aid allocations led to more NDC votes, then we should be fairly confident that the NDC would have done better had donors more fully disbursed the foreign aid they had committed for 1999. In order to answer the first question, about the degree of control that the NDC exercised over foreign aid resources, it is first necessary to consider where the NDC would have tried to allocated funds if it had a completely free hand.

A MODEL OF RESOURCE ALLOCATION

This section builds a simple model to examine how a strategic incumbent party would allocate aid if it had a free hand in doing so. It is reasonable to assume that the incumbent party wants to win presidential

elections for the foreseeable future, and thus that it would allocate resources in an attempt to gain votes. This suggests that the NDC in Ghana would allocate fewer than expected resources to areas in Ashanti and Volta, because both regions were already largely committed – and viewed as committed – to political parties. In the words of one NPP executive committee member who was interviewed while his party was in power in 2005, 'some [constituencies] we just ignore completely because whatever we do we'll lose' (Fridy 2007: 2). Obviously these areas must receive some resources, because over many elections they may come to resent being 'taken for granted', and cease to be safe havens. Nevertheless, over reasonable time spans, an electorally self-interested party would allocate fewer resources to these areas than other criteria, such as measures of need, would suggest. The question then becomes, how should an incumbent allocate resources among the parts of a country that are not committed?

At this point the incumbent party may choose to direct resources to areas that lean towards or away from itself, or to areas that are evenly split.[7] If the incumbent party has a multi-election time horizon, it should direct more resources to the areas that lean towards it, because in a repeated game one would expect parts of the country to shift their allegiances in response to the flow of resources in earlier time periods. Funding uncommitted areas that lean towards your party would thus give an incentive to all swing voters to move towards the incumbent party in the next election. By the same token, if the incumbent party directed more resources to areas that leaned away from it, then it would be encouraging future voters to vote for the opposition. This effect on the next election matters, because there is no unambiguous theory to guide the incumbent if we only consider the effect of resources on votes in the present election. Areas that lean towards the opposition provide more possible votes to switch but, given a secret ballot and low monitoring potential, resources can only induce voters to switch if voters acknowledge the support of the incumbent, which is more likely in areas where the incumbent is more popular (Nugent 2007). Of course, the areas that already lean towards the incumbent – and thus are most likely to acknowledge the incumbent's resources – offer fewer switchable votes. This results in indifference between the two choices in the current election, and this is why the effect on future elections is important.[8]

This is an extremely simplified version of Ghana's politics, but it does provide a general guide as to how one might expect the incumbent NDC to target resources. First, we would expect the NDC to want to spend less on committed areas like Ashanti or Volta. Second, we would expect the

NDC to want to direct more resources to the parts of the country that are non-committed but lean towards the NDC. Third, we would expect that while both Volta and Ashanti will receive lower levels of resources than other criteria (such as population) would suggest, Volta should generally be treated better than Ashanti, because it is the safe haven of the incumbent NDC and Ashanti is the safe haven of the out-of-power NPP. In general, then, more votes for the incumbent should translate into more resources in future elections, but this pattern will not hold in areas that are considered committed to either major party.

EMPIRICS

During the late 1990s and early 2000s, the Ghanaian Ministry of Finance did not keep centralised records of sub-national aid disbursements. At the Ministry level, record keeping on aid was generally uneven and sparse. In order to examine how the NDC actually allocated foreign assistance, I circumvented these data issues by collecting sub-national allocation information on the National Electrification Project (NEP), a large World Bank and bilateral donor-funded infrastructure programme that ran from 1993 to 1999.[9] Infrastructure for electricity was in short supply throughout the 1990s. The World Bank (1993: 1–4) estimated that in 1990, 70% of Ghanaians consumed energy generated from burning wood or agricultural waste, 20% gained access to energy through petroleum products, and 10% had access to grid-powered electricity. The Ghana government conducted a survey in 1991/2 that estimated that while 24% of all Ghanaians had access to some form of electricity, the figure was only 5% in rural areas (GSS 1992). Thus the electrification programme was very popular with rural Ghanaians.

The National Electrification Project

While the NEP is only a single project, it grew out of a Ghanaian and World Bank effort to ameliorate the situation described above. The primary goal of the NEP was to erect high voltage power lines across Ghana, especially in the rural areas that completely lacked grid power. This would connect twenty-seven district capitals to the grid, and create the high voltage network that would then allow smaller, low-voltage, lines to branch off towards towns. In addition to the high-voltage lines and the district capitals, the project was also initially expected to electrify about 530 towns.[10]

TABLE 1
Determinants of NEP funding to regions

	1	2
Area	267·9*** (67·4)	221·1** (62·9)
NDC vote share in 1992	–	347,881·8** (116,052·9)
Volta dummy	–	−17,200,000** (6,245,480)

Source: Area data from *Ghana in Figures 2005*, Table 1.5; voting data from Bawumia 1998: 48. ***p<0·01 **p<0·05 *p<0·1, n = 10. Robust standard errors in parentheses.

Thus, while this paper analyses only one aid project, it is one that covered an entire sector and laid the foundations for future electrification in Ghana. While other electrification projects were active at the time, such as Self-Help Electrification Projects (SHEPs), all of these hinged on having a high-voltage power line nearby. The NEP was building those lines across the country, and thus it structured who could get electricity in the future. The next section examines how NEP resources were allocated within Ghana and compares the allocations against vote returns for the NDC in 1992, the year before the plan for the NEP was finalised.

Regional targeting of NEP funds

By and large, the regional dispersion of NEP resources did approximate the model laid out above. At the start of the NEP, every region of Ghana had a large number of people in need of electricity. In this situation, the cost of electrifying the communities in a region should correspond roughly with the size of the region. This is because the cost of building high voltage power lines increases with the length of the line, not with the number of connections. You have to pay the same to build a kilometre of electric line if you are connecting a thousand people to the grid or only ten. Thus, even if gigantic Northern Region and tiny Greater Accra had the same number of unelectrified communities, construction should cost more in Northern Region. This suggests that one objective measure of how much money should be allocated to each region is its size. Indeed, as Table 1 shows, the area of a region is a statistically significant predictor of its NEP funding. Figure 1 shows that the area of a region explains half of the variance in NEP funding between regions. Each additional square kilometre of land in a region increases NEP funding by US$268.

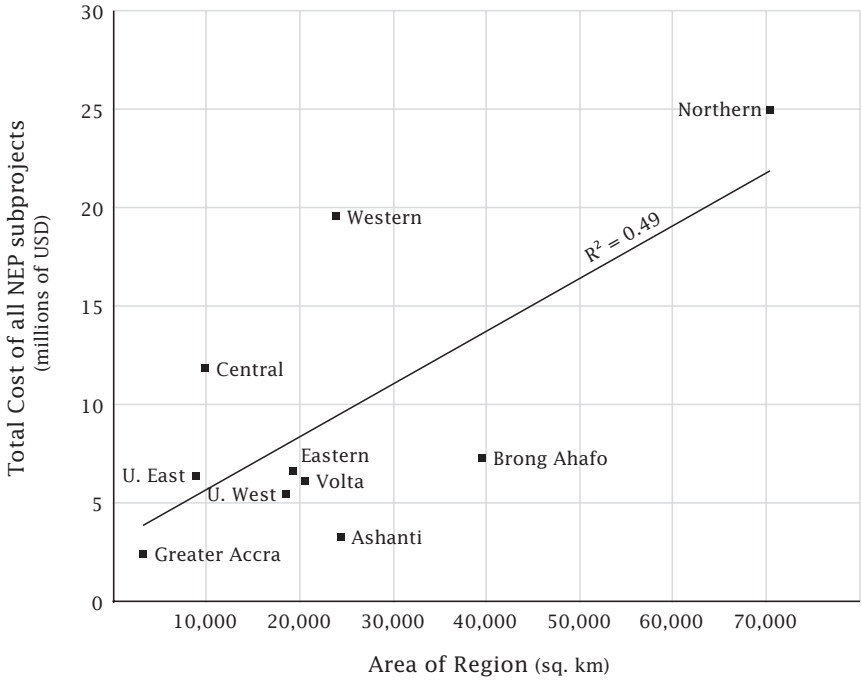

FIGURE 1
Explaining NEP resource allocation with the size for each region.

What is most interesting about Figure 1 is the pattern in the residuals. While technocratic measures like the size of each region clearly matter, Volta and Ashanti received fewer resources than their area alone would predict, and regions that leaned towards the NDC, like Central or Northern, received more than their area alone would suggest. The deviations from the one variable regression thus seem to follow the pattern described earlier. In this pattern, more votes for the NDC in past elections correspond with more resources, unless you are in committed Volta Region. In order to test for this relationship, I re-ran the previous regression but included a measure of the NDC's vote share in 1992 and a dummy variable for Volta. All three variables are significant, and the Volta dummy coefficient is large and negative, as was expected.[11] Each additional percentage point of support for the NDC in 1992 corresponds to an increase in NEP funding of about US$350,000. The results are consistent with the idea that the NDC targeted votes with electricity funding at a regional level, but that this did not apply to committed Volta Region, which was comparatively underfunded.

While this regional pattern is suggestive, it could reflect something else: the fact that at a regional level, poverty and NDC support are closely aligned. This alignment makes it is very difficult to convincingly show purely political targeting of resources in Ghana at a regional level. It is possible that the NDC (or the World Bank) was effectively targeting the large regional differences in poverty, and not politics, by supplying electrification to the poorer parts of Ghana.[12] To correct for this possible bias, I also collected data on NEP spending at the level of the smallest national voting unit in Ghana, the constituency.

Constituency-level targeting of NEP funds

Analysing sub-national units is a common way to increase the number of observations in an analysis (King *et al.* 1994), and in this case it also helps to control for confounding variables such as the fraction of the population that is urban and has access to better infrastructure. I received a list of all communities that were electrified in Upper West and Upper East Regions, along with the date of electrification, from the Ministry of Energy. This list was checked against the original NEP Feasibility Study by Acres International, the World Bank implementation completion report, and annual reports from the Volta River Authority. Additionally, an interview with a former Northern Electricity Department (NED) manager confirmed the accuracy of the list.[13] While it would have been preferable to receive a list of all electrified communities in Ghana, NEP record keeping was uneven. The Northern Electricity Department, a subsidiary of the Volta River Authority, was responsible for electrification in the northern part of the country and generally kept better records than the Electricity Corporation of Ghana, which was responsible for the south. I thus regrettably have to restrict the constituency-level analysis to Ghana's northernmost regions. Later in the paper, I discuss how this affects the generalisability of the results.

There are eleven districts, which in total contain twenty constituencies, in the two northern regions of Ghana. Of these, twelve constituencies fall inside 'ordinary' districts and eight fall within 'municipal' districts. Ordinary districts are more rural,[14] and thus less likely to already have services or infrastructure such as electricity. The fourth Ghana Living Standards Survey (GSS 1999) found the level of access to grid-powered electricity to be 0% in Upper West and 4% in Upper East.[15] It is safe to assume that the 4% electricity access in Upper East would all have been concentrated in the municipal districts of Bolgatanga or Bawku East, which first received limited electricity in

TABLE 2
Comparisons between and within municipal and ordinary districts

	District grouping	Per cent urban	Literacy rate	Access to piped water
Comparisons within ordinary districts	Districts in which all constituencies received electrification (3)	7·8%	24·2%	8·9%
	Districts in which some constituencies received electrification (2)	6·9%	22·2%	6·1%
	Districts in which no constituencies received electrification (3)	9·0%	22·6%	9·5%
Comparisons between municipal and ordinary districts	Average across all municipal districts (3)	23·6%	25·7%	16·5%
	Average across all ordinary districts (8)	8·0%	23·1%	8·4%

Source: GSS 2000; the number of districts in each group is in parentheses.

1989 and 1992, respectively. This means that in 1998, before the NEP reached the far north, the rural constituencies in Upper East and Upper West had no grid-powered electricity.

The analysis is limited to constituencies in rural (or 'ordinary') districts, not only to remove the influence of prior electrification but also to limit the influence of urbanisation, which is my main confounding variable and covaries with many other possibly relevant omitted variables.[16] Table 2 uses census data from 2000 to show how municipal districts differ from ordinary districts. Census data is recorded at the district rather than constituency level, so the ordinary districts are grouped into those in which all constituencies experienced electrification, those in which some constituencies experienced electrification, and those in which no constituencies experienced electrification. The table also compares municipal and ordinary districts. While some individual-level characteristics, such as the literacy rate, are quite similar across all district groupings, the characteristics that depend more highly on state investment, such as piped water, show marked differences between ordinary and municipal districts. Residents are much more likely to have piped water if they live in a municipal district. Notably, differences in piped water provision between ordinary districts are not large, and the overall provision is low. This should increase our confidence in the comparability of the constituencies in ordinary districts.

In 1999, forty-eight communities in the far north were slated to be connected to the grid under the NEP. About half of them received electricity in 1999 and the other half did so after additional construction in early 2000, still prior to the election in December. These forty-eight communities fell within seven constituencies. Two of these constituencies were removed from the analysis because they were in the more urbanised municipal districts. This set-up provides me with two groups of very similar rural constituencies. Five constituencies received electricity thanks to donor-funded construction in 1999, and seven constituencies did not receive electricity under the NEP, which ended in March 2000. Thus, I have a group of twelve very similar constituencies that are split almost evenly between those that received donor-funded electrification projects and those that did not.

At this level of analysis, there is clear evidence of political targeting of NEP resources. The plan for the NEP was finalised after the 1992 election, and in that election the average vote for the NDC across all the rural constituencies in Upper East and Upper West was 45·8%. None of the five constituencies where the NDC received 45·8% of the votes or lower received electrification under the NEP, while five out of the seven rural constituencies where NDC votes exceeded 45·8% received electrification. This is a very strong result, as basically the only relevant distinctions between these constituencies are their voting behaviour and their likelihood of receiving electricity under the NEP.

While the region-level evidence for political targeting of donor-funded electrification can only offer muted support, the constituency-level data are much cleaner and show that – at least in Upper West and Upper East – the NDC aimed electrification in 1999 at the constituencies that offered it more support in 1992. It is not possible to test whether committed areas are treated differently from contested areas with these data, because none of these constituencies offered a high level of support and none could be considered committed to either party.[17] Political strategy thus seems to have been an important factor in the allocation of donor-funded electrification in Ghana. The constituencies that eventually received electricity in 1999 voted much more for the NDC earlier in 1992, the year before the NEP plan was finalised. Less conclusively, it may also be that regions that offered high, but not unequivocal, support to the NDC received more total resource allocation from the NEP. The next section examines whether this allocation of aid projects influenced support for the incumbent NDC party. Was aid only used to reward voters, or did aid also win voters?

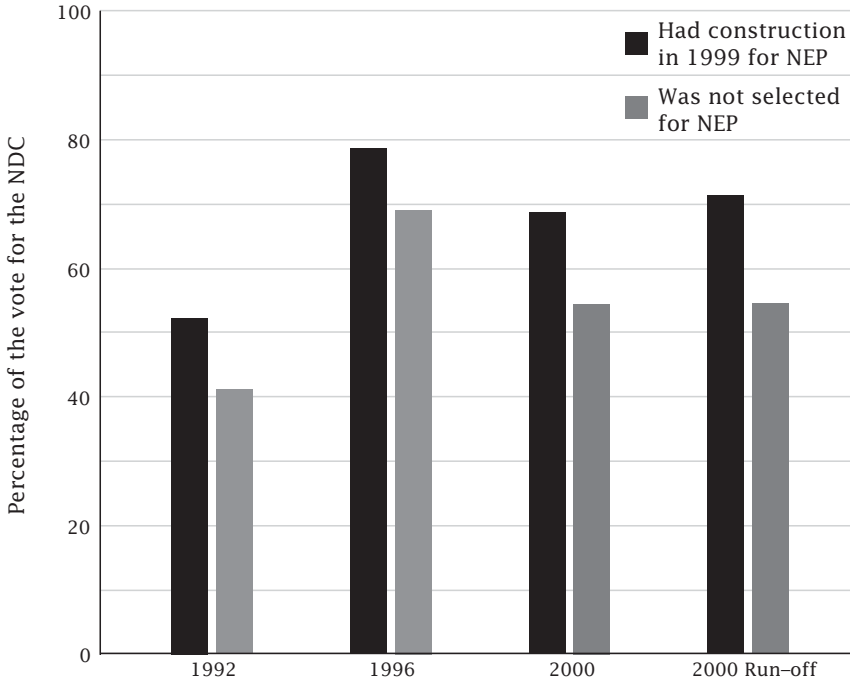

FIGURE 2

Mean NDC vote across rural constituencies in Upper West and Upper East, grouped by electrification status.

Electoral effects of constituency-level targeting

This section demonstrates that aid resources also won voters to the NDC. Had the NDC received more aid in 1999, it would very likely have done better in the 2000 election. This section examines the same constituency-level data from Upper East and Upper West to test whether the NEP construction in 1999 affected NDC support in 2000. The obvious problem with this approach is that, in relation to voting levels, the decision to electrify a given constituency was clearly not decided randomly. The NDC was more likely to electrify constituencies that supported it in 1992, so the persistent difference in voting levels that is apparent in Figure 2 is not evidence of electrification causing an increase in NDC votes.[18]

In order to circumvent this problem, the constituencies were divided according to planned NEP electrification status, and their vote changes between elections were compared in place of vote levels. This is a better approach for three reasons. First, it controls for all persistent

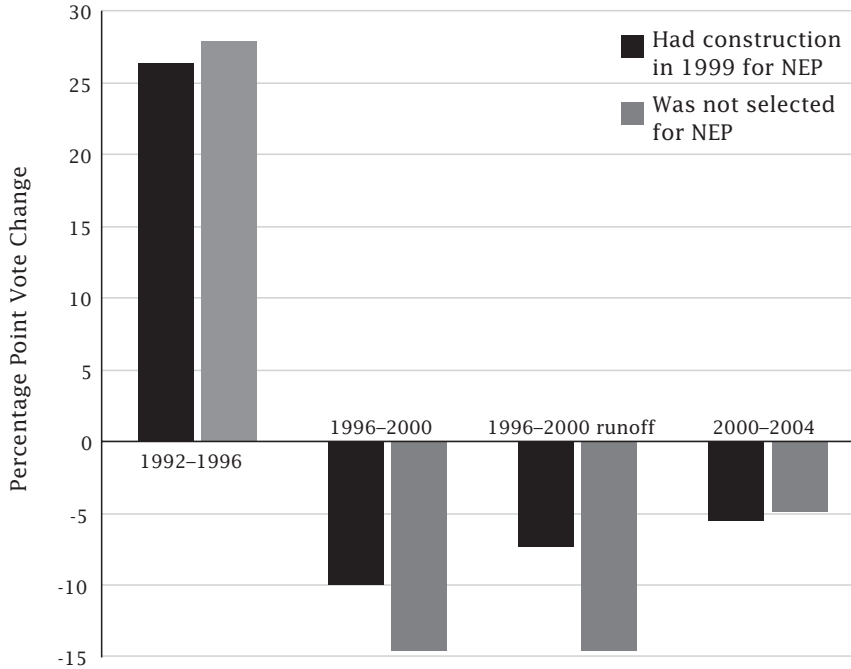

FIGURE 3
Mean NDC vote change across rural constituencies in Upper West and Upper East, grouped by electrification status.

constituency-level factors that may influence the analysis. Second, it removes the influence of any time trend that affects both groups equally.[19] Third, it tests more directly the claim that infrastructure helps the incumbent, because rather than testing whether aid projects lead to an incumbent doing *well* (a measure of vote level), it examines if aid projects lead to an incumbent doing *better* (a measure of vote change). Given that a constituency's level of NDC support in 1992 appears to have been part of the rule that the NDC used to allocate NEP resources, this quasi-experiment hinges on the assumption that a constituency's level of NDC support in 1992 is independent of how it would respond to electrification construction seven years later. I believe that this is a reasonable assumption because the vote differences between these constituencies in 1992 were not very large, because the NDC was genuinely popular across the Upper West and Upper East, and because these constituencies are very similar on other observed characteristics. Figure 3 presents constituency-level vote changes between elections.

Between 1992 and 1996, the two groups of constituencies experienced a similar change in their support for the NDC. This equal increase in both groups is expected, because they are similar in all respects except for the NDC's decision to target one with electrification in the future and their overall level of NDC support. The similar vote change in 1992–6 supports this idea and provides a baseline from which we can judge the effect of electrification, which occurred in 1999. The second set of bars, from 1996 to 2000, shows what is undoubtedly a bad time for the NDC. All across the country – and across the Upper West and Upper East – the NDC lost votes. However, if we look at the difference in the mean vote changes between the two groups, we see that the NDC lost about five percentage points more of the vote in the constituencies that it did not electrify. This pattern is even starker when the 1996 election is compared against the 2000 run-off, where the NDC lost about seven percentage points more in constituencies that it did not electrify.[20] We can gain confidence that the divergence in 1996–2000 is due to electrification by looking at the difference in vote changes between 2000 and 2004. In this period, as in 1992–6, there were no new events that divided the two groups and, as expected, the difference in mean vote changes between the two groups of constituencies is only 0·5%.

In relation to vote changes, the only relevant distinction between the two groups of constituencies is that one received construction as part of the NEP in 1999. Both groups saw their mean voting behaviour move in essentially the same pattern between 1992–6 and 2000–4, but the voting behaviour of the groups diverged in the period 1996–2000, when the only significant difference between the two groups was that one received aid-funded electrification. While the two groups do differ in terms of their overall level of support for the NDC, they only experienced different vote changes during the electrification period. This is strong evidence for the claim that electrification projects increased NDC support.

Validity and the counter-factual

What would have happened had the NDC government received *more* aid and been able to build *more* infrastructure in 1999? The previous analysis suggests that the NDC would have done better in the 2000 election. However, the quasi-experiment only examined twelve very similar rural constituencies in similar regions, and in doing so it sacrificed external validity for internal validity. While we can be quite confident in the logic and rigour of the quasi-experiment, the results cannot be immediately generalised to the rest of Ghana. Specifically, the quasi-experiment

looked at *electrification* in *rural* constituencies in *northern* regions. Therefore, I cannot immediately generalise to other types of infrastructure, to urban areas, or to other regions. Before I can address the core question of whether more aid would have led to the NDC doing appreciably better, I need to examine these three issues to see how broadly I can apply the analysis.

Other forms of infrastructure

The previous analysis only examined the electoral effects of an electrification project, so it is worth considering if there is something special about electricity provision, and if voters might respond differently to electrification than to road construction or the provision of piped water. While it is quite possible that voters respond more (or less) to electrification than other forms of infrastructure or services, it is unlikely that voters only respond to electricity. Indeed, the NDC's explicit strategy and election advertising, as well as press reports and academic analyses, bundle water, roads and electricity provision into a 'developmental package' that the NDC promised to provide. Ideally, the analysis would include many more forms of infrastructure in Ghana in 1999, but the data were not available. This issue should make us sceptical of the magnitude of the effect of other forms of infrastructure provision, but the likely direction of the effect seems clear. Other forms of infrastructure also would have helped the NDC, though perhaps not to the same degree.

The rural/urban divide

The comparison was drawn across rural constituencies and there are no empirical or theoretical grounds to expect it to hold in urban areas. This limits the scope of the analysis to rural areas, but in 2000 urbanites made up only 44% of Ghana's population (GSS 2000). Based on the NDC's track record, its stated intentions, and the previous analysis of NEP targeting, it is very likely that any increases in infrastructure or service provision in 1999 would have targeted Ghana's rural majority anyway. The prior analysis of northern rural voters shows that they would probably have responded by increasing their support for the NDC.

Regions and language

Even if the analysis is restricted to rural areas and all forms of infrastructure induce voters to roughly the same degree, it is still possible that

TABLE 3
Electrification rates across regions in 2000

Region	Rural	Urban
Ashanti	18%	81%
Brong Ahafo	12%	66%
Central	23%	65%
Eastern	15%	65%
Greater Accra	27%	84%
Northern	5%	60%
Upper East	3%	53%
Upper West	2%	61%
Volta	18%	48%
Western	20%	78%

Source: GSS 2000

rural areas in different regions may respond differently to infrastructure provision. There may, for example, be something peculiar about rural constituencies in Upper West and Upper East that prevents them from being compared to rural areas in Northern or Western regions. These regional differences could exist because of differences in the base level of services or infrastructure across regions. As Table 3 shows, this is unlikely. While there may soon be a point in time when basic infrastructure such as electricity, roads or piped water is so prevalent in rural Ghana that additional extensions will bring rapidly diminishing marginal returns, that time has not yet come. It certainly did not exist in 1999. While Upper East and Upper West have especially low electrification rates (a factor which increased the internal validity of the quasi-experiment), rural areas across Ghana are clearly not near the point where the government would face declining marginal political returns to infrastructure spending.

Of the other factors that may skew rural voting across regions, language is the most plausible. Fridy (2007) has shown that language groups are especially good predictors of party support, with Ewe speakers favouring the NDC and Akan speakers the NPP. Thus, it is reasonable to expect that Ewe and Akan speakers may respond differently to government spending from other groups, such as those in the north. Hypothetically, I will take the extreme position that all Ewe speakers, Akan speakers, and urbanites are not even partially influenced by new infrastructure spending. Removing all urbanites and all Ewe and Akan (Asante, Fante, Akuapem and general Akan) speakers from the

2000 census leaves 37% of the population. This non-urban, non-Akan, non-Ewe subset of the population had an electricity usage rate of 13% in 2000 (GSS 2000). Even if the most restrictive scope conditions are applied to the analysis, I can still comfortably expect almost 40% of the population to respond to infrastructure provision by increasing their support for the NDC.

Further, the previous theoretical and empirical sections have shown that it is likely that this 40% of the population would have disproportionately received any increases in NDC aid, or at least aid that was for local public goods such as roads, piped water, health clinics or electrification. The rural point is easy to follow, as the NDC's policy platform was to target rural areas and it received a great deal of support from rural areas. Ewe speakers would probably have received less aid than one would expect from an economic calculation alone, because they reside primarily in the south of the NDC-committed Volta Region. Akan speakers are dominant in the core NPP Ashanti Region. So, while the analysis of the effects of aid spending only applies to about 40% of the population, it also applies to the segment of the population that would likely have received additional aid, had it been disbursed.

Unfortunately, while there is strong evidence that infrastructure provision in 1999 helped the NDC in 2000, it is not possible to measure precisely the expected magnitude of the effect across Ghana. In rural constituencies in Upper West and Upper East, the NDC secured fewer votes in 2000 than it did in 1996, but its vote change was five percentage points greater in the electrified constituences (see Figure 3). This may actually underestimate the likely magnitude of the effect in other regions, as the NDC was competing with the regionally popular PNC party in the first election round in the north. In most of Ghana, the election was always a two-horse race between the NDC and NPP. If we compare the vote change in the north between 1996 and the 2000 runoff – which restricted the race to the NDC and NPP – then the NDC's vote increase was seven percentage points larger in the electrified constituences. The generally accepted story is that the NDC won votes with its infrastructure projects in 1992 and 1996 (Bawumia 1998; Herbst 1993; Nugent 1999, 2001, 2007; Roberts 1996). This paper provides empirical support for the belief that the NDC benefited from such spending, and I believe that this is the first empirical analysis of this often-made claim. While we cannot know precisely what would have happened had donors disbursed more of the aid that they committed, the NDC would very likely have done better. While the NDC lost the runoff by a fairly large margin, it lost the first round by only 4%, and it is

difficult to say what sort of run-off dynamics would have been unleashed had the NDC been in the lead going into the run-off. Before the 2000 election the NDC made claims of 'an anti-NDC conspiracy by Western donors' (Gyimah-Boadi 2001: 106). These claims seemed outrageous and still seem unfounded, but they now also seem a shade closer to reality than most donors would like to admit.

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This paper has shown that Ghana's NDC government was able to allocate resources from the World Bank and bilateral donors according to political criteria. This presents a counter-example to the widely held idea that African governments lose control of resource allocation when they accept foreign aid. The paper also shows that the NDC benefited electorally from this aid. Finally, it was argued that were the NDC able to strategically allocate – and electorally benefit from – aid, then the aid decline in 1999 would almost certainly have hurt it at the polls in 2000. While it is fairly clear that the NDC would have done better had more aid been disbursed, it is not at all clear that fully disbursing aid would have caused the NDC to win. Despite a lengthy search, I was unable to locate the data required to test this claim.

Apart from underscoring the importance of collecting these data, the paper presents a number of other avenues for future research. First, it would be useful to test for the electoral influence of other kinds of infrastructure or services and to test in other parts of Ghana or in other countries. I have argued that my analysis of northern constituencies is probably generalisable to about 40% of all of Ghana's citizens and to other kinds of infrastructure. Regardless of whether the argument is persuasive, it should receive further testing within Ghana. Second, it would be fascinating to examine the processes behind ostensibly technocratic planning to uncover precisely where and how politics exerts an influence over final outcomes.[21] Third, one could test the allocative model proposed in this paper in other countries with committed voting populations. The idea that incumbents may distinguish between committed regions and regions that simply favour their party is not appreciated in the debate between core and swing voter models, and is probably testable in other countries in Africa.

The closing lesson from the Ghanaian case is that aid fluctuations can influence an incumbent's chance of re-election. While we cannot make the claim that the aid reduction, or the terms of trade shock, tipped the election away from the NDC, the prior analysis suggests strongly that the

NDC would have done better if aid had been fully disbursed. This is a serious and unacknowledged political effect of foreign aid, and it adds further emphasis to the argument that donors should coordinate their aid to reduce volatility. While it is possible that donors intentionally change their aid levels to reward or punish incumbents, it is more likely that aid volatility, caused by poor coordination and donors' inability to stick to spending targets, exerts a modest but measureable force on voting patterns in African democracies.

NOTES

1. Lindberg & Morrison (2005: 583) summarise Ghana's voting breakdown succinctly: 'In the stable two-party system in Ghana, rural belongingness, low levels of education, farmer and working-class jobs, and low income signify a stable alignment with the leftist-oriented NDC, whereas the opposite plus being employed in the public sector is typical of voting for the contemporary expression of the liberal, more right wing tradition in Ghanaian politics, the NPP.'

2. This reference crops up uncited repeatedly in writing on Ghana's elections. Andbo (2001) claims that Rawlings said that Volta was the NDC's World Bank of votes to a reporter after the 1992 election.

3. Despite Ghana's pro-poor policies, large regional inequalities persisted over this time period (GSS 1999). The general pattern is that poverty increases as you move north. In 1998/9, the incidence of poverty (measured as the inability to meet basic food and non-food needs) in Upper West and Upper East was 84% and 88%, respectively. At the same time it was only 38% in Volta, 28% in Ashanti, and 5% in Greater Accra. The presence of grid-powered electricity in 1998/9 follows a similar pattern, with very large differences between the lowest regions of Upper West and Upper East (with 0% and 4%), middling regions such as Western and Ashanti (with 49% and 46%), and Greater Accra (with 82%).

4. The cedi exchange rate in 1999 was about 3,500 cedi = US$1, so a decline in project assistance of 235 billion cedi represented a shortfall of about $67 million.

5. Information for 1998–2000 was unavailable, so information for 2001 was used. The World Bank (2000b) has a slightly higher average figure of 68% over the period 1990–7.

6. This corresponds to a decline in aid from 10% of Gross National income (GNI) in 1998 to 8% in 1999.

7. Ghana has an absolute majority system for electing the president. If no candidate reaches 50% + 1, then there is a run-off between the top two candidates. This model would have to be modified if applied to other contexts.

8. This argument can be extended and tested in various ways. For example, it requires multi-election time horizons and so should be applicable only in countries with either no term limits or fairly entrenched party systems. We would not expect consistent targeting of leaning but uncommitted voters in a country with term limits and a highly personalised political system, because incumbents do not have time horizons that span many elections. In these political systems term limits may provide a point where one can test the influence of time horizons.

9. While it would have been preferable to gather data on all aid for infrastructure allocations across Ghana, these data were unavailable.

10. In the World Bank 1993 Staff Appraisal Report this was revised downward to 434 towns.

11. For NDC vote share $p=0.024$ and for the Volta dummy $p=0.033$.

12. The NDC was not spending more NEP resources in areas with the largest population without electricity. While the size of a region is a robust predictor of NEP funding, the estimated number of people per region without electricity in 1991 is insignificant. This makes sense, because each region had a fairly large share of the population without electricity and most of the costs of grid extension depend on area rather than population.

13. Interview conducted on 24.6.2011 at the Ministry of Energy in Accra, Ghana.

14. This distinction between ordinary and municipal districts was decided in 1989 and Ghanaian census data (GSS 2000) show that ordinary and municipal districts are still sharply different in their level of urbanisation.

15. The 95% confidence interval for Upper East was between 1.8% and 6.7%. There is no confidence interval for Upper West because no one surveyed (out of 120 people) had grid-powered electricity. The survey was carried out in 1998, before NEP construction began. It is likely that there was electricity in the Upper West before the NEP, because the Volta River Authority completed a grid extension project that involved the Upper West on 21 September 1996. However, this only involved construction in the municipal district of Wa. In order to improve internal validity, the analysis ignores constituencies in municipal districts and so this does not pose a problem.

16. Urbanisation and electricity provision are both so low in ordinary districts that they are almost 0 in the 1991/2 and 1998/9 Ghana Living Standards Surveys (GSS 1992, 1999). Some municipal districts have electrification, and the mean rate of urbanisation across municipal districts is twenty percentage points higher than in ordinary districts.

17. The highest level of NDC support in 1992 was 68% in the constituency of Garu-Tempane, in the municipal district of Bawku East. Anecdotally, this constituency was one of two municipal constituencies to receive construction under the NEP in 1999.

18. P-values from two-tailed (unequal variance) t-tests were 0.08 for 1992, 0.13 for 1996, 0.07 for 2000 (first round), and 0.02 for 2000 (run-off).

19. It removes time-persistent unit-level effects because it looks at changes. The beauty of this approach is that so long as the effect is persistent over time, I do not need to observe it in order to remove its bias from the analysis. By comparing two similar groups over multiple time periods it also removes the influence of factors that affect both groups over time. The logic at work here is the same as using a difference-in-differences estimator.

20. The vote changes from 1996 to 2000 exhibit much higher variance than the vote changes between 1996 and the 2000 run-off. It seems that electrification influenced voters much more when the choice was between only the NDC and the NPP, and less when the choice was between the NDC and the regionally popular PNC. *P*-values from two-tailed (unequal variance) t-tests were 0.82 for 1992–6, 0.41 for 1996–2000, 0.12 for 1996–2000 run-off, and 0.90 for 2000 (first round)–2004.

21. I would like to thank an anonymous reviewer for pointing out the importance of uncovering the processes linking political influence to the technocratic planning for actual aid projects.

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