

The Allocation of Public Goods and National Elections in Ghana

Pierre André¹
Sandrine Mesplé-Soms²

June 2009

First draft

Abstract: This paper analyses how political concerns affect the allocation of public goods. It studies Ghana over the period 1998-2003, which includes a democratic turnout. Several household surveys representative at the national level and electoral results of two election rounds are used and provide a panel of the 110 Ghanaian districts. Most empirical papers in political economy find that the public funds target the government supporters or the swing districts. Our results reflect the contrary: we observe that, when the NDC was in charge (with Jerry Rawlings as president), the pro-NDC districts received less public goods. We assert that this result is partially driven by a kind of allegiance to the opposition party bigwigs. Finally, when we control for votes and other covariables (including wealth, urbanization and density), the ethnic variables have no impact on public good allocation.

Key words: Public goods, elections, ethnic, Africa, Ghana.

¹ Paris School of Economics, pierre.andre01@polytechnique.org

² IRD, DIAL Paris, mesple@dial.prd.fr

1. ELECTORAL MOTIVES AND PUBLIC GOODS ALLOCATION

Public goods are one of the objectives of political action and the allocation of public goods may affect electoral outcomes. Wantchekon (2003) has shown in the case of Benin that the electoral promise to build public goods in a particular place is sometimes efficient for a candidate. Economic modelling has extensively shown why public goods allocation may not be optimal in a democracy where the people are stakeholder of the decision process. The first reason is the electoral design. In a two-party system, the candidates running for elections need more than 50% of the votes. The first works by Downs (1943) and Bowen (1957) show that with a left/right differentiation and two candidates, both candidates have incentives to target the “median voters”, who are in the middle of the left/right axis. The public policies may then be biased towards the preferences of the median voters. Among empirical papers, Dahlberg and Johansson (2002) show in the Swedish case that the municipalities with the highest density of voter in the middle of the left/right axis³ receive more discretionary funds from the state. They do not find any particular evidence that the regions supporting the government were particularly targeted. Diaz-Cayeros (2008) finds that the New Deal’s funds were more important in states with volatile votes. According to the “median voter theory”, the candidates may prefer targetable goods. Pushing this idea, Lizzeri and Persico (2001) set up a framework of competitive elections with non-ideological, rationale and selfish voters. They show that the optimal electoral commitment for the candidates is to give targetable goods to a short majority of voters, and to tax the others to balance the state’s budget constraint. So in their model there is under provision of non-targetable goods. Case (2000) finds that in Albania the social assistance is biased towards the regions supporting the incumbent party and the regions where the gap between this incumbent party and the opposition was small. Finan (2004) shows that in the Brazilian case most of the deputies’ budgetary amendments targeted the elections that gave some support to the deputy. Those results may obviously be a combination of “median voter” targeting and pure redistribution to the incumbent’s supporters. Diaz-Cayeros (2008) shows that in Mexico, the states with non-versatile votes received more national solidarity funds. His interpretation is that in the Mexican case, the PRI party was hegemonic and hence invested in riskless regions to keep a majority.

The second reason why public goods allocation may not be optimal in a democracy is the time consistency of political commitments. Alesina (1987) shows that even if the electoral game is repeated⁴, the president’s politic may be a mix between his own political preferences and his electoral commitment⁵. The same model would show that the president’s politic may also be a mix between his own interest and electoral promises. Pande (2003) shows that mandated representation of scheduled castes changes the priorities in expenses of Indian states. This gives some support to Alesina’s theory in the case of India, as the (elected) representatives from the scheduled castes seem to have had some leeway to implement policies targeting their castes. Chattopadhyay and Duflo (2004) emphasize the same mechanism. Using political reservation for women in Indian local village councils to study the impact of women’s leadership on policy decisions, they find that women invest more in the public goods more closely linked to women’s concerns (like drinking water).

³ As measured by a political questionnaire.

⁴ i.e. the president can be reelected in the future.

⁵ In the model, this depends on the president’s preference for present, on the polarization of preferences between both electoral parties, and on the relative popularity of both electoral parties.

Keefer and Vlaicu (2008) show that when electoral commitment is not credible, patronage relations may be a second best policy. They define patronage as the fact that politicians rely on local intermediaries who will make credible their pre-electoral promises. Then, we expect that the districts with patrons supporting the incumbent party receive more public goods. Schady (2000) finds that the FONCODES social fund in Peru is biased towards the incumbent president's supporters. Moser (2008) finds that the incumbents give more public goods to their supporters'⁶ municipalities in Madagascar prior to the 2001 presidential election. Joanis (2008) finds the same result in the case of road spending in Québec, but this time with panel data. Robinson and Torvik (2005) show that white elephants may be a consequence of the poor credibility of electoral promises. In their model, the incumbent builds inefficient projects targeting his supporters. He is then the only credible candidate for operating the inefficient infrastructure after the election. On the other hand, the opposition and the incumbent would both operate efficient projects. Limited electoral commitment may also generate political budget cycles, meaning that the public goods provision is particularly high during the election years. This seems to be the case in the paper of Schady (2000) in Peru, Banful (2009) in Ghana and Cole (2009) in India (in the case of agricultural credit provided by government-owned banks), for example.

Finally, it may be the case that the information on the action of the government is not perfect. Besley and Burgess (2002) show in the case of Indian states that public food distributions are more important when food grain production is low only in the states with a high circulation of newspapers, and calamity expenditures are higher when there is a flooding only in the same states. Ferraz and Finan (2007) use corruption audits ran in randomly selected Brazilian municipalities. They find that the release of these audits decreases the probability of a mayor to be reelected when some corruption was discovered.

In addition to national policy, local collective action may affect the availability of public goods. For example, Banerjee and Somanathan (2007) show that the ethnic heterogeneity deterred the increase in public goods availability in India between 1971 and 1991, as it is often found to deter local collective action (see Alesina and La Ferrara, 2000, Bardan and Dayton-Johnson, 2001, Dayton-Johnson, 2000, Khwaja, 2002, for instance). Foster and Rosenzweig (2001) study the implications of democratic governance and fiscal decentralization for the provision of public goods to particular local population groups. They use a panel data set from 250 villages over the past twenty years and show that in villages with democratic governance, the share of the poor (landless) increases with the share of public resources allocated to roads (roads increase the welfare of the poor in that case). This does not appear to be the case in villages with a non-democratic governance system.

This paper analyses how electoral rules affect the allocation of public goods in Ghana. To our knowledge, two papers study the allocation of public goods in the Ghanaian context. Akramov and Asante (2008) show that in 2003, the districts with less ethnic heterogeneity, more literacy and access to radio, and the South of the country have more public goods. However, using only cross-section data makes difficult to identify any causal link between the availability of public goods and demographic characteristics of district populations. Banful (2009) studies the District Assemblies Common Funds before and after the 2000 parliamentary and presidential elections. She shows that the central government has attributed less money to the districts supporting his party (the NPP) after 2000. This tends to be contradictory with the results from the rest of the literature, since all the other studies in

⁶ Supporters are defined on an ethnic basis in this paper.

developing or developed countries showed that more public goods were allocated either to swing districts or to the incumbents' supporters.

The main weakness of the empirical papers regressing policy outcomes on electoral outcomes is the endogeneity of the latter. The main identification challenge is actually to disentangle the role of political strategies from non-electoral considerations driving the spatial allocation of government spending. One solution to handle this problem is the exploitation of time-series data including a democratic turnout.

Our empirical strategy relies on the study of Ghanaian districts from 1998 to 2003. We mobilize several household surveys representative at the national level, the 2000 population and infrastructure census, and electoral results of two election rounds, in 1996 and 2000. The last election provides a democratic turnout: the NPP party won the elections whereas the NDC had been in charge since 8 years. We show that the spatial allocation of public goods in Ghana is not driven by voting buying, the "swing districts" not being more supplied. The patronage motive is not obvious: the districts supporting the parties in charge did not receive more public goods. To a certain extent, our paper extends the result of Banful (2009) to the provision of public goods. We observe that, when the NDC was in charge (with Jerry Rawlings as president), the less the vote during the 1996 election have been pro NDC, the more the districts received public goods. We put forward an explanation of this fact, showing that it is probably driven by the targeting of politically "sensible" districts, like those where national NPP leaders were candidates, and districts of the Accra region. During the NPP government period, districts who supported this party did not receive more public goods than others. Finally, when we control for votes and other covariables (including wealth, urbanization and density), the ethnic variables have no impact on public good allocation.

The remainder of the paper is organized as follows. Section 2 reviews the political and macro-economic Ghanaian context. The data are described in section 3. Empirical strategy and results are presented in section 4. Section 5 discusses the robustness of our results and section 6 offers concluding remarks.

2. GHANAIAN CONTEXT

Ghanaian Political History

Ghana is independent since 1957, and has regularly switched between dictatorship and democracy between 1957 and 1992. Semi-democratic or democratic periods in Ghana include 1957-1964, 1969-1972, 1979-1981, and the country experiences his longest episode of democracy since 1992. The two main political parties have been relatively stable through all the democratic experiences in Ghana. Before the independence, the first Ghanaian political party was the United Gold Coast Convention (UGCC), led by Joseph B. Danquah, including members of the local African elite. In 1949, Kwame Nkrumah broke away and founded the Convention People's Party (CPP), which presented a more radical nationalist platform. The rivalry between the CPP and the UGCC/NLM⁷ was constant in the 1950s and 1960s in pre-independence and post-independence elections. The Ashanti region and the

⁷ The National Liberation Movement replaced the UGCC in 1954

educated elite were in majority for the NLM which had a rather conservative programme. The CPP defended the masses, and had more radical positions, sometimes close to socialism (though Nkrumah claimed to be non-aligned). The CPP won most of the elections after 1951, Nkrumah being president of Ghana after 1960. He was nevertheless dismissed by a coup in 1966, after having been named president for life in 1964. In the next elections in 1969, Kofi Busia, who was one of the founders of NLM, won the elections. At best, both political parties didn't manage to improve substantially the living standards in Ghana during this period.⁸ This (and repeated coups) caused a great political instability during the first decades after independence.

In 1981, the Flight Lieutenant Jerry Rawlings made a coup and managed to remain durably in charge. Though he wasn't elected, he claimed all the stakeholders in the country could be part of the decision-making process, and created various committees to make it possible. Though the government at that date included Nkrumahists in its left wing, the economic stability of the country was on the agenda of this government in the beginning of the 1980s. The Economic Recovery Program included privatization of state-owned assets and the devaluation of the Cedi, the Ghanaian currency. In the end, Rawlings' government (and successors) managed to restore stable growth since 1984.

Under both international and domestic pressure, Rawlings' government established democracy in the 1992 elections. Since then, presidential and legislative elections are held every four years.⁹ Rawlings was candidate for his own succession in the name of the National Democratic Congress (NDC). A candidate represented the Danquah/Busia tradition, in the name of the New Patriotic Party (NPP). Three candidates represented the Nkrumahist tradition and the most credible of them had an electoral agreement with the NPP. Rawlings was a charismatic leader with a populist platform like Kwame Nkrumah, and the NDC is considered as ideologically close to Nkrumah tradition (see Morrison, 2004). The Nkrumahists were divided and paradoxically allied with the right-wing party. That is why the NDC has progressively replaced the Nkrumahists in the Ghanaian political life since that date, though some of the realizations under Rawlings' dictatorship were definitely not in a socialist agenda.

Since then, the NDC is considered as the left-wing party in Ghana, and is a member of the socialist international, whereas the Nkrumahists have become minor parties. The NPP is considered as the right-wing party. However, the political parties are also differentiated on an ethnic basis. As for the NLM, the NPP is largely supported by the Ashanti, and has its geographic strongholds in the Ashanti region. Conversely, the Volta region, populated with Ewe, Rawlings' ethnic group, votes for the NDC. To a lesser extent, the Northern poorest regions tend to vote for the NDC (see Bossuroy, 2008). These geographic patterns have been constant since 1992. (See Figure 1)

In 1996, as the Ghanaian political system favours bipartisanship, the two main parties (NDC and NPP) obtained most of the votes, and the NDC won both presidential (with Jerry Rawlings) and legislative elections. Though the NPP progressed in mainly Akan constituencies of the Eastern region, and in specific areas of the Northern and Western regions, it did not manage to progress a lot in most of Central, Bong-Ahafo and the rest of the Western region (see Nugent, 1999). In addition, the Northern and Upper regions voted for the NDC in majority like in 1992. Two factors may have affected this pattern: these regions are historically reluctant to vote for the Danquah/Busia tradition, and the NDC had local partisans

⁸ By December 1981, GDP had declined by 3% per year for 7 years.

⁹ However, the first legislative elections were not representative since they were boycotted by the opposition.

in most remote area, whereas the NPP didn't. So the access to the media was crucial for the NPP, and it was poor in remote areas at that date (ibid., Asante and Gyimah-Boadi, 2004). Finally, the NDC kept the majority in most of the constituencies of the Greater Accra, whereas the costs of the Structural Adjustment Programme were heavily born by parts of the urban population (ibid.). These patterns were qualitatively similar for the legislative and presidential elections.

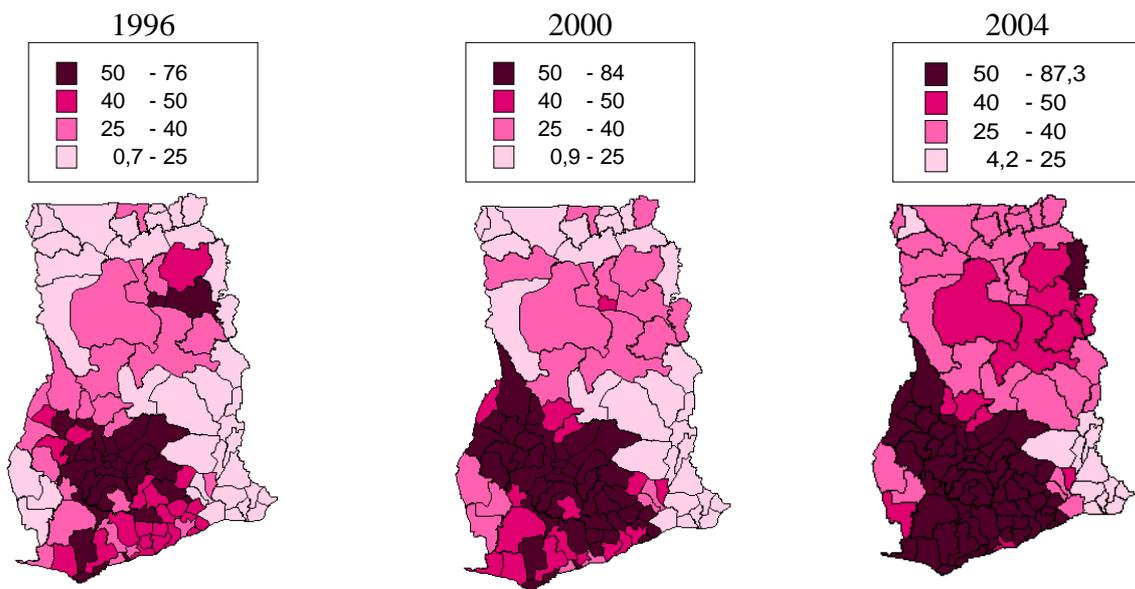
The 2000 elections were very different from the previous ones. First, Jerry Rawlings could not run since the constitution did not allow him to run after two presidential mandates. Instead, the candidate of the NDC was John Atta Mills, who was perceived as less charismatic and less known at that date. In addition, the campaign of the NDC was sometimes considered as arrogant and the economic situation was not so good (Boafo-Arthur, 2008). So the elections were won by John Kufuor for the NPP and the NPP won the legislative elections. However, this turnout was geographically heterogeneous: broadly 80% of Central, Brong-Ahafo and Northern deputies were members of the NDC in 1996. In 2000, NDC won 80% of the seats in the Northern region, 50% in the Central region, and 33% in the Brong-Ahafo, where the turnout was impressive with 66% of the seats for the NPP (Asante and Gyimah-Boadi, 2004). Overall, though Asante and Gyimah-Boadi (2004) and Boafo-Arthur (2008) report that the turnout was partly due to the fact that the NPP was no longer perceived only as an Ashanti party, the NPP essentially got the support of the Akan and Accra regions (Ashanti, Eastern, Brong-Ahafo and to a lesser extent Central).¹⁰

The victories of the NDC in the North seemed nevertheless fragile before the 2004 elections. In fact, vote-buying was reported in these places in 1992, 1996 and 2000. In addition, the electoral campaign in these remote areas requires important funds, and Rawlings' populist personality was less salient in 2004 (Asante and Gyimah-Boadi, 2004). In addition, Nugent (2005) mentions that the NPP made a lot of efforts to get votes in these regions. However, despite a progression of the NPP, the NDC kept by far the majority in the North of Ghana. Instead, the NPP progressed in the Central and Eastern regions. Finally, the NPP (and Kufuor) won the presidential and legislative elections in 2004, but this predominance remained fragile, and this party had lost part of his influence in Accra.

The second democratic turnout in Ghanaian history took place in 2008. John Atta Mills (NDC) won the presidential elections with 50.23% in the second round, and the NDC had 114 deputies out of 228 (107 for the NPP). Nana Akufo-Addo was candidate to the presidential election for the NPP.

¹⁰Asante and Gyimah-Boadi (2004) mention anti-Ashanti feelings in some regions (Ashanti is the biggest ethnic group among Akan and is associated with the NPP). This could explain why softening the ethnic identity of the NPP could be profitable for this party in non-Ashanti Akan regions.

Figure 1 : Presidential elections, % of votes to the NPP party, 1996, 2002 and 2004



Sources: Electoral official results, our own calculations

Public service policies in Ghana

A centralized system behind decentralization reforms

In 1988, a major decentralization programme was launched and was notably designed to devolve political and state power¹¹ to the district assemblies. One of the objectives of the programme was to ensure that people living in rural areas have access to basic services and infrastructure. A list of 86 specific responsibilities of the district assemblies has been defined, including the building, equipment and maintenance of primary, middle, secondary and special schools, and the promotion of public health (Asante, Ayee, 2008). However, most of observers of the decentralization process assert that many factors impeded the local government capacities, autonomy and performance (Asante, 2003; Asante, Ayee, 2008; Akramov and Asante, 2008). District Assemblies act then as agents of central government without significant discretionary power. The lack of funds is one of the reasons of the weak decision power of District Assembly: transfers from the central government accounted for over than 80% of total local revenues and for around 2.5% of Central Government Public Expenditure.¹² Economic and social policy orientations are then decided at the central level of the government.¹³ Actually, the will to preserve as far as possible a strong central government has always driven the policy and reforms of Ghana since independence. For instance, a federalist system has always been rejected, and it is well known that one of the aims of the

¹¹ Including decentralized administration, development planning and implementation.

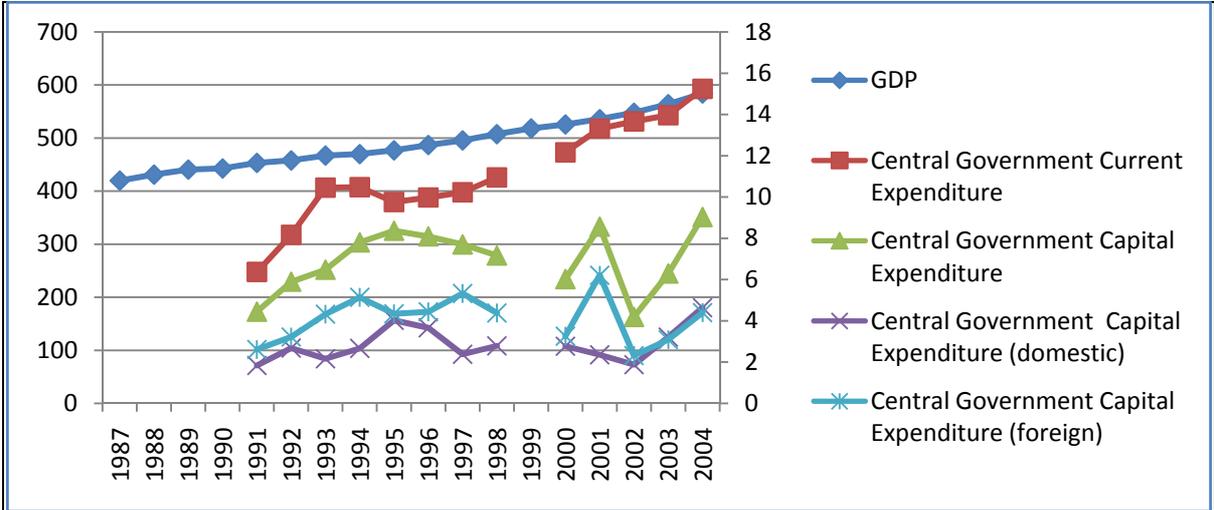
¹² These funds (District Assembly Common Funds, DACF) are allocated between districts based on a formula, which is approved by the National Parliament every year. According to Akramov and Asante (2008) and Banful (2009), this formula considers various social and economic factors, such as “Need”, “Responsiveness”, “Service Pressure”, and “Equality”.

¹³ Appendix II describes, in more details, national policies of water and electricity supplies and the central agency organizations that are in charge of both production and distribution of water and electricity.

decentralization reforms – first implemented by Rawlings – was to dampen the chieftaincies’ power (Jacquemot, 2007).

Whereas growth records during the 1970s were very unevenness, over the past two decades, Ghana’s growth performances have been positive and stable with little variance, the real GDP per capita rates reaching around 2% per year. Notice that there was a slight slowdown in the rate of growth since the mid 1990s and a little faster growth since 2001 (Aryeetey, Kanbur, 2008). This twenty year period of economic growth was at the beginning concomitant to liberal reform programs with major support from the International Monetary Fund and the World Bank. Since 1991, the structural liberal reforms have been coupled with a series of plans¹⁴ which place emphasis on poverty reduction and human development.

Figure 2: Constant GDP and public expenditure per capita (Cedis), 1987 – 2004



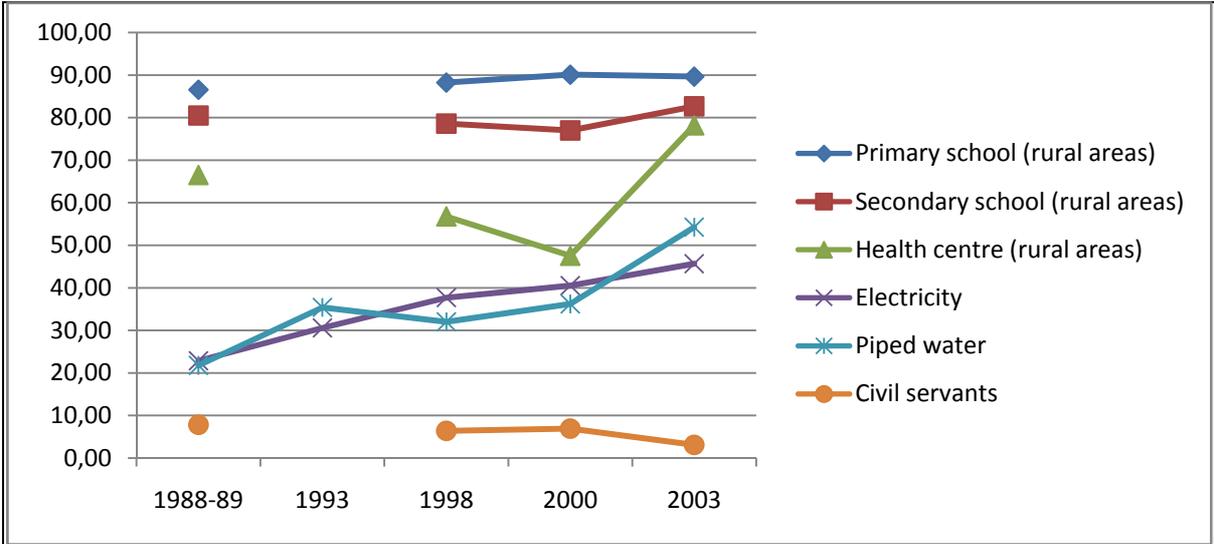
Sources: IMF 2000, 2006; WDI 2006.
 Note: Central government public expenditure data are not available in 1999.

As can be seen in Figure 2, public expenditure per capita increased continuously during this period of stability and growth, even if the growth of public capital expenditure have been more erratic than current ones. One can note that most of public investments are financed by Official Development Assistance (ODA) supporting the greater part of the reforms and investments in the social sectors. The functional distribution of total central public expenditure (financed by resources from Government of Ghana sources plus by donors’ grants and credits) produced by Tsekpo and Jebuni (2008) suggests a substantial redistribution of public funds to social services and infrastructure against less allocated funds to administration and economic services. Figure 3 presents the national mean levels of public facilities that are analyzed in this paper except that primary, secondary school and health facilities are rural mean indicators, as the available data do not give statistics on the school and health centre facilities in towns (see section Data below and Appendix I for more detailed information on the data).

¹⁴ The first was the report entitled “Making People Matter: A Human Development Strategy for Ghana” (1991), followed by the “National Development Policy Framework” (1994) latter renamed “Vision 2020”. A first five year policy statement was later developed into the “First Medium Term Development Plan 1996-2000”. In 2000, an “Interim Poverty Reduction Strategy Paper” was produced, followed in 2003 by the “Ghana Poverty Reduction Strategy” (GPRS).

The average mean access to primary and secondary schools, even in rural areas seem quite high, around 90 percent of rural people lives in localities with at least one primary school. Most of these facilities have been built during the Nkrumah period (1957-1966), for instance 66% of primary school facilities counted in 2000 (Akyeampong *et al.*, 2007). The main progress observed since the middle of the 1980s seems to be in the electricity and water provisions. The percentage of people connected to electricity doubled whereas access to piped water has been multiplied by 2.5 times. The employment in the public sector appears to decrease, especially from 2000. These comparisons between different surveys remain nevertheless fragile, as they rely on the comparability between surveys.

Figure 3 : Public good provision (% of people with access public facilities), 1988- 2003



Source: see section on data, below.

Note: Accesses to primary, secondary schools and health centre are measured as percentage of people living in rural localities with primary, secondary schools and health centres; electricity and piped water indicators are the percentage of people living in house connected to electricity and with any access to piped water; finally, civil servants statistic is the percentage of people working in the public sector in the whole active population.

Regional disparities of public goods in Ghana

These national levels of equipment hide high regional disparities (Figure 4). The most obvious regional inequality is between the North and the South of the country that is quite correlated to poverty (Figure 5). As noted by Shepherd *et al.* (2006), the origins of this inequality lie in several factors:

- geography, the Northern part of the country is a Savannah region with lower rainfall than in the Southern one;
- the pre-colonial relationships between kingdoms and tribes, more precisely between the Ashante Kingdom that used to practise slave trade of people coming from the North (Austin, 2005);
- the colonial dispensation that favoured the South by actively promoting migration to the Forest zone in the South and not promoting investment in the North;
- the post-colonial failure to break the established unequal pattern. During the structural adjustment period (80’s), the North’s economic interest has been neglected, the cocoa

production zone of the South being more targeted by the reforms. From the 1980s, several programmes drawing attention to poverty reduction have been adopted. Donors and international NGO, and to a lesser extent the Ghanaian Government, concentrated their efforts substantially in the North without reducing significantly the North-South gap.

Nevertheless beyond the North South divide of the country, there are disparities between districts. The disparities within the North are especially salient between rural and urban areas. In the South, some districts of Brong Ahafo, Western or even Ashanti regions are less endowed with public goods than Upper West, Upper East and Northern regions (Figure 4). As said, the aim of the paper is to analyze to what extent electoral motive has an impact on this *between* district disparities and its evolution since the end of the 1990s.

Figure 4 : Normalized public goods aggregate, 2000

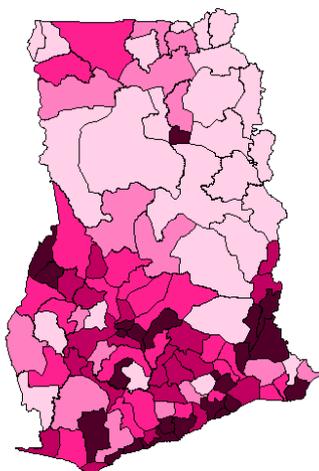
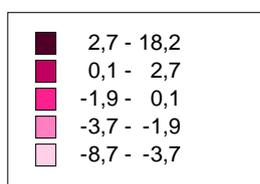
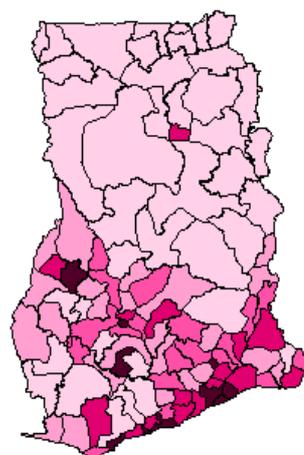
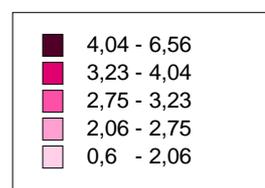


Figure 5 : Mean score of household housing conveniences, 2000



Source: Population and Infrastructure Census, 2000, our calculations.

Note: map on the left represents the normalized aggregate of public good. Public goods are primary and secondary schools and health centre in rural areas, civil servant, and electricity and piped water connections. Map in the right corresponds to the mean score of conveniences of the housings by district. The score is the sum of indicators of combustibile used, and material of construction of the roof, the walls and the floor of houses. The highest the score level is, the best housing conveniences are (see Section 3 and Appendix I).

3. DATA

This paper uses both electoral data and several national household data. The electoral results for the presidential elections 1996, 2000, 2004 are aggregated at the district level.^{15, 16}

Our information on public goods and covariates come from several national household datasets, namely GLSS4 (1998), DHS (1998 and 2003), the national household and facility census in 2000, and the CWIQ 2003 survey.¹⁷ All these surveys provide us with information on the availability of public goods in Ghanaian districts through 3 points in time: 1998, 2000 and 2003. They include information about the share of households with an access to electricity and to tap water¹⁸ (all surveys), the share of civil servants (all but DHS surveys), the share of the rural population with an access to primary schools, secondary schools, and community clinic¹⁹ (all surveys but DHS). All this information is aggregated at the district level, so as to generate district access rates to each facility. The information on each public good is normalized, so that the observations of a given good in a given survey have the same mean and standard deviations. This ensures the comparability between public goods. In some specifications, we aggregate the information on the public goods in each district by summing up all the information by survey for each district. Appendix I gives in details the definition of each variable and the sample size for the surveys used.

The same national household dataset include information on the socioeconomic outcomes in Ghanaian districts: they include for example information on education, on the quality of the household (but DHS surveys), on ethnic and religious composition. All this information is aggregated at the district level.

4. EMPIRICAL STRATEGY AND RESULTS

This paper estimates the potential relationship between the allocation of public goods in Ghana and the electoral results. The first model we estimate is:

$$G_{gd,t} = \rho G_{gd,t-1} + \alpha \delta(t) \text{diff}_{d,t-1} + \gamma \text{diff}_{d,t-1}^2 + X_{d,t-1} \beta + \varepsilon \quad (1)$$

$G_{gd,t}$ is the amount of public good g in district d at date t . Hence this model pools all the kinds of public goods. $\text{diff}_{d,t}$ is the difference between the share of the votes for NPP and for NDC

¹⁵ We thank Thomas Bossuroy for giving us the electoral data he collected in Ghana and he aggregated at the district level.

¹⁶ We use the districts of the 2000 census. The legislative and presidential elections are simultaneous in Ghana. Since both results are highly correlated, we focus on the presidential elections results in this paper. Legislative constituencies are nested in the 2000 districts.

¹⁷ The surveys GLSS1 and DHS 93 were used in section 2 so as to give national statistics in 1988 and 1993.

¹⁸ Inside or outside the household.

¹⁹ The information is nevertheless based on the availability of the public good in the community for GLSS and facility census, and based on the transport time between the households and the facility in CWIQ survey.

at the last presidential elections,²⁰ so it takes positive values if the NPP was a majority in the district and negative values if the NDC was a majority. $\delta(t)$ takes value 1 if the NDC is in charge at date t (period 1998 – 2000) and 0 if the NPP is in charge at date t (period 2000 – 2003). The coefficient *alpha* captures the fact that the running government deserves or not his supporting districts with more public goods. The coefficient *gamma* is the coefficient of the square of the difference between NPP and NDC. It is expected to be negative, political competition, notably in swing districts, may increase the investments in public goods. A vector of covariates $X_{d,t}$ is added, including notably proxies for the wealth and education in the district, ethnic composition of the district, region-year dummies and type of goods-survey dummies. Our specifications include the covariates at date $t-1$, since the investments between date $t-1$ and date t may affect the covariates at date t .

Table 1 shows the result of the estimation of 6 different specifications of model (1). The first specification does not include any control for the characteristics of the districts, whereas specifications 2 and 3 include different vector of covariates and the fourth specification includes district fixed effects (without any covariate). The last two specifications are described and analysed latter. All specifications include region-year dummies and survey-public goods dummies. The standard deviations of the estimates are robust to the correlation of different observations of the same district.

In each specification, the public good index at date $t-1$ is a predictor of the public good index at date t . The coefficient is positive and significant, as expected.

The coefficients for urbanization (as measured by the share of urban population and the log of density) and mean education in the district are positive in column 3. The coefficient for wealth (as measured by our household convenience index) is not significant, but it is strongly correlated with urbanization and education. This means that urban districts receive more public goods, and may be due to cost-recovery policies and community-driven approaches, or national political targeting. The coefficients for the other covariates are not significantly different from 0 at the 5% level. The Akan districts, and even more the Ashante districts, receive less public goods than the other ones, but those results are significant only at the 10% level.²¹

²⁰We use exclusively the results of presidential elections in this paper, though we checked that using the results of legislative elections give the same results.

²¹ This last point is true only after controlling for the other covariates. The same regressions without controlling for the votes would nevertheless give a totally different story on ethnicity, as votes are strongly correlated with ethnicity in Ghana. Once ethnic clientelism has been disentangled from electoral clientelism, the effect of ethnic clientelism appears small and rarely significant.

Table 1: Determinants of the allocation of public goods in Ghana

	(1)	(2)	(3)	(4) - FE	(5)	(6) - FE
lag of public good index	0.49** (0.04)	0.35** (0.04)	0.35** (0.04)	0.29** (0.04)	0.35** (0.04)	0.30** (0.04)
Square of the difference in votes between NPP and NDC	0.50* (0.24)	0.35 (0.21)	0.39+ (0.21)	0.43 (0.72)	0.25 (0.20)	0.49 (0.79)
Difference in votes * (1998 - 2000)	0.79** (0.25)	0.71** (0.24)	0.62+ (0.34)	0.66+ (0.34)	-0.08 (0.29)	0.35 (0.36)
Difference in votes between NPP and NDC	0.56** (0.14)	0.19 (0.17)	0.25 (0.21)	-0.16 (0.49)	0.46* (0.19)	-0.03 (0.56)
Difference in votes * NPP candidate minister after 2000 * (1998 - 2000)					1.85** (0.51)	1.66** (0.63)
Difference in votes * NPP candidate minister after 2000					-0.96** (0.30)	0.16 (0.87)
Difference in votes * District in Accra region * (1998 - 2000)					1.58** (0.36)	1.93** (0.33)
Difference in votes * District in Accra region					-0.88** (0.23)	0.25 (2.03)
Share of urban population in the district (measured in 2000)		0.30+ (0.18)	0.29 (0.18)		0.11 (0.18)	
Education index in the district		0.32** (0.10)	0.30** (0.10)		0.36** (0.10)	
Household convenience index		0.06 (0.05)	0.06 (0.05)		0.14** (0.04)	
Ethnic heterogeneity index		-0.77 (0.69)	-0.69 (0.68)		-1.13 (0.73)	
Share of Akan in the district		-0.30+ (0.16)	-0.13 (0.22)		-0.22 (0.22)	
Share of Akan in the district * (2000 - 2003)			-0.32 (0.34)		-0.20 (0.28)	
Share of Ewe in the district		0.04 (0.19)	0.20 (0.27)		-0.15 (0.28)	
Share of Ewe in the district * (2000 - 2003)			-0.32 (0.39)		0.33 (0.40)	
Share of Asante in the district (measured in 2000)		-0.55+ (0.28)	-0.45 (0.44)		-0.24 (0.35)	
Share of Asante in the district (in 2000) * (2000 - 2003)			-0.18 (0.60)		-0.41 (0.53)	
log(population density) (measured in 2000) * (1998 - 2000)					0.27** (0.06)	
log(population density) (measured in 2000)		0.14** (0.04)	0.15** (0.04)		0.01 (0.04)	
NPP candidate minister after 2000 * (1998 - 2000)					-0.29 (0.18)	
NPP candidate minister after 2000		0.10+ (0.06)	0.10+ (0.06)		0.34** (0.10)	
Observations	1480	1449	1449	1480	1449	1480
R-squared	0.515	0.571	0.571	0.616	0.589	0.622

** , * , + mean respectively that the coefficients are significant at the 1%, 5% and 10% levels.

Notes: OLS with standards errors given under the coefficients. The standard errors are corrected for an arbitrary correlation between different observations of the same district. The public goods included in the specification are: share of households connected to the electricity, the share of households with access to any tap water, the share of the active population being a civil servant, the share of the rural population with an access to a primary school in the community, the share of the rural population with an access to a secondary school in the community, the share of the rural population with an access to a health clinic in the community. All the specifications include region-year fixed-effects and type of public good-survey fixed effects. Specifications 4 and 6 include district fixed effects.

In the first specification, the difference between the votes for the NPP and for the NDC is correlated with the increase in infrastructure availability. The coefficient is nevertheless much smaller and not significant once controlled for the covariates, especially mean wealth level of the district (column 2 and following ones). The fact that the vote coefficient is divided by two when controlling for urbanization and education can be explained by the fact that the NPP is the right-wing party in Ghana. The districts voting for the NPP are on average wealthier, and wealthier districts receive more public goods. The correlation between the votes and infrastructure availability diminishes once controlled for our proxies for wealth, education and urbanization. The same coefficient is very close to 0 and imprecisely estimated in column 4, with districts fixed effects. The electoral results of Ghanaian districts are strongly correlated through time. So the imprecision of this coefficient in the fixed-effects estimator is due to the fact that it is estimated with the differences of votes in each district through time.

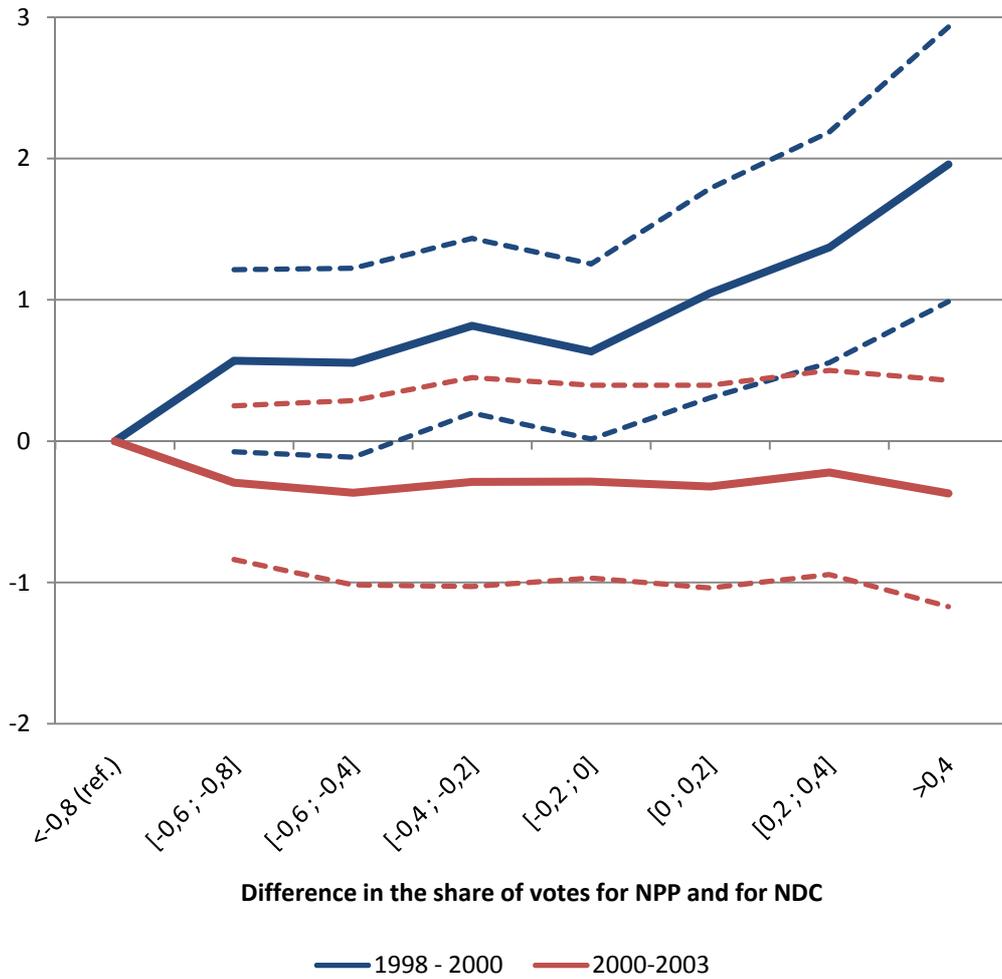
The coefficient of the differences in votes interacted with the dummy for the first period is expected to be negative according to the “patronage hypothesis”: when the NDC is in charge, the districts voting for the NPP are expected to receive less public goods. It is however positive, and significant in each specification. This result is very similar to Banful (2009): she observed that the districts voting for the NPP received less DACF²² common funds after 2000 and approximately the same amount before 2000. We find that the districts voting for the NPP received more public goods before 2000 and approximately the same amount after 2000. The difference between the DACF and our public goods aggregate may be partly due to the unobservable characteristics of the districts. In fact, the districts supporting the NPP are wealthier than the districts supporting the NDC. So they may obtain more public goods regardless of the government transfers, or obtain different government transfers.²³ This would explain that the districts supporting the NPP received more public goods for 1998 – 2000 than others and the same amount of DACF, and the same amount of public goods for 2000 – 2003 with less DACF. However, it remains that the double difference between the districts supporting NPP and NDC and the two periods is the same, and seemingly reflects some “negative patronage”.

We extend here Banful’s results in two ways. First, we extend it from the DACF to the actual availability of public goods. Second we use a more flexible form between the electoral results and the public goods allocation. In fact, Banful compared the DACF allocation between the districts where NPP was a majority and the districts where NDC was a majority. We use a linear relationship between the electoral results and the allocation of public goods, which fits better with our data than the dummies used by Banful. Figure 6 plots semi parametrically the difference in share of votes between NPP and NDC in the district and the allocation of public goods. It shows that the relation is close to be linear. The coefficient for the square of the difference between NPP and NDC votes is nevertheless positive and significant in most specifications. This is unexpected, as the allocation of public goods should favour the most competitive districts, like the swing districts; but it disappears in the last columns.

²² DACF stands for District Assemblies Common Fund

²³ The Ghanaian government subsidizes the districts through the DACF. Therefore, direct government investments are not included in the DACF.

Figure 6 : Allocation of Public goods and votes, semi-parametric specification.



Notes: This Figure gives the correlation between the electoral results and the public goods in Ghanaian districts, as in specification 2 of Table 1, with a dichotomized variable for the share of votes.

The specifications 5 and 6 give an interpretation to the counter-intuitive relationship between votes and the allocation and public goods. Column 5 includes covariates and column 6 is the district fixed-effect specification. It splits the relationship between the votes and the allocation of public goods between different contexts. It singles out the districts where a candidate for the NPP at the 1996 legislative elections²⁴ was minister after 2000. The idea behind this is that in those districts, the local leader of the NPP was probably a national leader before 2000. Knowing the names of each Minister of Kufuor's government from 2001 to 2005, the 1996 legislative results give information about their candidature or not and in which district they have been candidates. Among 37 Ministers, 15 were NPP candidates at the 1996 legislative election and 14 have been elected. 8 out of 15 districts they were candidates, were urban ones (proportion of urban population higher than 50%) and 6 were district capitals. In those 15 districts, the coefficient for the correlation between support for the NPP and public goods in the first period is positive and significant (1.85 and 1.66). By comparison, it is not significant in the comparison districts (-0.08 and 0.35). Our interpretation of this result is the following: in addition to its electoral objectives, the government needs to peacefully control the country. Therefore, "sensible" districts are rewarded to ensure the stability of the country. The districts with an opposition leader may have been considered as sensible principally if they were electoral strongholds of the opposition. This would explain the positive coefficient of the interaction between our proxy for political leaders and the votes during the NDC government.

The correlation between the support for the NPP and the differences in votes is also positive in the Accra region during the first period. This is also compatible with our theory of "sensible" districts, as the capital regions are known for being a good place for demonstrations.

Column 5 also shows a negative coefficient for the votes in Accra region during the NPP rule. This means that the districts voting for the NPP in Accra receive less public goods after 2000. This coefficient is intuitive: Accra is a sensible place for both parties. Therefore, it may be logical that when the NPP is in charge, the districts in Accra region voting for the NDC receive more public goods.

Lastly, column 5 shows that the coefficient for the votes in the districts with a minister between 2000 and 2003 is negative: in those districts, the districts where the NPP was a minority receive more public goods. This may be explained by the incentives for ministers and the government, if the minister wants to be likely to be reelected as a deputy in the future.

5. ENDOGENEITY CHECKS

This section assesses the validity of the interpretation of the coefficients in Table 1. It focuses on the link between the allocation of public goods and votes. Section 4 has shown that the investment in infrastructure during the NDC rule was particularly important in the "sensible" districts²⁵ voting for the NPP. The OLS estimates could be biased because of two different mechanisms: reverse causality and omitted variables. The reverse causality does not seem plausible in this case. The allocation of public goods between 1998 and 2000 does neither cause the votes in 1996 nor the fact that a given district is in Accra region. In addition, it

²⁴ Or several candidates.

²⁵ i.e. districts with a national leader of the NPP or in Accra region

seems implausible that the ministers in the NPP government after 2000 were chosen because they obtained public goods from the NDC before 2000.

Concerning the omitted variables bias, it could be the case that the districts with a national leader of the NPP and in Accra regions who voted for the NPP have particular unobserved characteristics. Table 2 assesses whether the decomposition between Accra region and districts with a national leader on the one hand and the other districts on the other hand in Table 1 is spurious. In other words, we check whether any underlying characteristic explains that among the firsts, the districts voting for the NPP in 1996 received more public goods before 2000, and not among the latter.

To do so, the difference in votes is interacted with several other characteristics (plus an interaction with the dummy for period 1998-2000): the population density of the district, the share of urban population, the education index, the household convenience index, and ethnic variables. Column 2 of Table 2 presents the results of this specification, and the first column of this table recalls the estimates from Table 1, specification 5.

If some of these supplementary observable characteristics are the underlying variables of the decomposition in specification 1, the coefficients are biased in column 1 and unbiased in column 2. In columns 1 and 2, the sign and significance of the coefficients interacted with the difference in votes is the same, which indicates that the omitted variable bias is probably moderate.

Table 2: Endogeneity checks: Control for omitted variables

	(1)	(2)	(3)
Difference in votes * (1998 - 2000)	-0.08 (0.29)	-2.38 (2.64)	0.02 (0.25)
Difference in votes between NPP and NDC	0.46* (0.19)	3.50 (2.20)	-0.04 (0.34)
Difference in votes * NPP candidate minister after 2000 * (1998 - 2000)	1.85** (0.51)	1.37* (0.55)	2.43** (0.55)
Difference in votes * NPP candidate minister after 2000	-0.96** (0.30)	-1.14** (0.33)	-1.26** (0.28)
Difference in votes * District in Accra region * (1998 - 2000)	1.58** (0.36)	2.06** (0.58)	2.47** (0.35)
Difference in votes * District in Accra region	-0.88** (0.23)	-1.41** (0.36)	-1.30** (0.24)
Difference in votes * log(population density) * (1998 - 2000)		0.47** (0.17)	0.14 (0.13)
Difference in votes * log(population density)		-0.19+ (0.11)	0.08 (0.06)
Difference in votes * Share of urban population * (1998 - 2000)		-0.38 (1.04)	
Difference in votes * Share of urban population		0.53 (0.71)	
Difference in votes * Education index * (1998 - 2000)		-0.38 (0.35)	
Difference in votes * Education index		-0.36 (0.27)	
Difference in votes * Household convenience index * (1998 - 2000)		-0.06 (0.28)	
Difference in votes * Household convenience index		0.38+ (0.22)	
Difference in votes * Ethnic heterogeneity index * (1998 - 2000)		1.66 (3.16)	
Difference in votes * Ethnic heterogeneity index		-2.26 (2.25)	
Difference in votes * Share of Akan * (1998 - 2000)		2.05+ (1.21)	
Difference in votes * Share of Akan		-1.52 (0.97)	
Difference in votes * Share of Ewe * (1998 - 2000)		-0.14 (1.28)	
Difference in votes * Share of Ewe		0.27 (0.96)	
Difference in votes * Share of Asante * (1998 - 2000)		0.57 (1.15)	
Difference in votes * Share of Asante		0.16 (0.88)	
Share of Ewe * region Ashanti * (1998 - 2000)			-2.69+ (1.44)
Share of Ewe * region Ashanti			1.63 (1.33)
Share of Asante * region Ashanti * (1998 - 2000)			0.21 (0.60)
Share of Asante * region Ashanti			0.57 (0.62)
Observations	1449	1449	1449
R-squared	0.589	0.604	0.585

*** , * , + mean respectively that the coefficients are significant at the 1%, 5% and 10% levels.*

Notes: OLS with standards errors given under the coefficients. The standard errors are corrected for an arbitrary correlation between different observations of the same district. The public goods included in the specification are: share of households connected to the electricity, the share of households with access to any tap water, the share of the active population being a civil servant, the share of the rural population with an access to a primary school in the community, the share of the rural population with an access to a secondary school in the community, the share of the rural population with an access to a health clinic in the community. All the specifications include region-year fixed-effects and type of public good-survey fixed effects, and the same covariates than specification 5 of Table 1, but all covariates are interacted with time in specifications 2 and 3.

The coefficient of the differences in votes in the districts with a NPP leader for the period 1998 – 2000 is nevertheless substantially smaller in column 2 (1.37) than in column 1 (1.85). This is due to the significance of the coefficient for the interaction between the difference in votes and the log of population density and the difference in votes for the period 1998 – 2000 (0.47). It appears that the districts with a NPP leader are more dense, which explains part of the relation in Table 1. Again, this is nevertheless compatible with our theory on of a targeting of “sensible districts”. The other coefficients interacted with difference in votes for the period 1998 – 2000 in column 2 are not significant at the 5% level, and do not change the coefficients of column 1.

The column 3 tests for an omitted variable bias due to other political considerations. Asante and Gyimah-Boadi (2004) explain that the Rawlings government made some effort in the Ashanti region. Two explanations are possible: the first one is the will to win the votes of the Ewe who migrated to that region to produce cocoa. The second one is linked to the traditional Ashanti Kingdoms, whose power could remain and impose specific public transfers from the central government. So we control for a specific effect of the share of the Ewe in Ashanti region. One of the two variables for this effect appears to be significant at the 10% level. In addition, we control for the same specific problem due to the Ashanti kingdoms. Those kingdoms are in the Ashanti region, and the best proxy we have for the districts involved in these kingdoms is the share of Asante ethnic group in the population. So we control for a specific effect of the Asante ethnic group in Ashanti region, which does not appear to be significant. Overall, the coefficients of column 3 are very similar to those of column 1. The coefficient the differences in votes in the districts with a NPP leader for the period 1998 – 2000 becomes much bigger as the effect of the log of density vanishes in this specification.

Table 3 presents the specification 5 of Table 1, disaggregated by type of public goods. The coefficients are imprecisely estimated here, as the sample has been divided in several parts. The sign of the coefficients remain nevertheless similar for each public good.

Table 3: Disaggregation between different types of public goods

	All	water	electricity	civil servants	primary schools	secondary schools	health centres
lag of public good index	0.35** (0.04)	0.61** (0.09)	0.41** (0.09)	0.30** (0.10)	0.30** (0.09)	0.11+ (0.06)	0.12 (0.09)
Square of the difference in votes between NPP and NDC	0.25 (0.20)	0.06 (0.33)	0.71+ (0.40)	-0.13 (0.40)	0.51 (0.78)	0.21 (0.43)	0.91+ (0.49)
Difference in votes * (1998 - 2000)	-0.08 (0.29)	0.08 (0.25)	0.05 (0.25)	0.21 (0.41)	0.89 (0.71)	0.41 (0.46)	0.55 (0.52)
Difference in votes between NPP and NDC	0.46* (0.19)	0.33 (0.22)	0.39 (0.27)	0.03 (0.34)	0.49 (0.49)	0.64* (0.29)	0.65+ (0.35)
Difference in votes * NPP candidate minister after 2000 * (1998 - 2000)	1.85** (0.51)	1.35 (0.90)	3.85** (0.81)	1.17 (1.39)	2.93* (1.46)	5.89** (1.28)	6.91* (2.69)
Difference in votes * NPP candidate minister after 2000	-0.96** (0.30)	0.22 (0.44)	-1.26** (0.45)	-2.15* (0.96)	-1.25 (0.93)	-2.90** (0.73)	-3.08** (1.05)
Difference in votes * District in Accra region * (1998 - 2000)	1.58** (0.36)	1.11+ (0.59)	2.86** (0.48)	1.17+ (0.60)	0.11 (0.90)	2.46** (0.74)	4.58** (1.09)
Difference in votes * District in Accra region	-0.88** (0.23)	-1.02+ (0.61)	-1.19** (0.33)	-2.51** (0.50)	-0.26 (0.80)	-0.46 (0.54)	-0.89 (0.55)
Observations	1449	318	318	208	197	204	204
R-squared	0.589	0.782	0.783	0.773	0.478	0.712	0.674

*** , * , + mean respectively that the coefficients are significant at the 1%, 5% and 10% levels.*

Notes: OLS with standards errors given under the coefficients. The standard errors are corrected for an arbitrary correlation between different observations of the same district. The public goods included in the specification are: share of households connected to the electricity, the share of households with access to any tap water, the share of the active population being a civil servant, the share of the rural population with an access to a primary school in the community, the share of the rural population with an access to a secondary school in the community, the share of the rural population with an access to a health clinic in the community. All the specifications include region-year fixed-effects and type of public good-survey fixed effects, and the same covariates than specification 5 of Table 1.

6. CONCLUSION

The paper tries to shed light to the link between democracy, on the one hand, and political institutions and development to the other hand. The Ghanaian democratization process gives the opportunity to analyse to what extent electoral rules affect the allocation of public goods in Ghana.

While most of empirical papers confirm the patronage hypothesis or the targeting of swing districts, our result reflect some “negative patronage”. When the NDC was in charge, between 1998 and 2000, the districts voting for the NPP received more public goods. We assert that this result is partially driven by a kind of allegiance to party bigwigs. This political pork-barrel may explain probably why politicians accept the democratic turnout. On the contrary, it may be the residuals of dictatorial practices, just before the first democratic turnout in Ghana. Between 1992 and 2000, Ghana was officially a democracy, but the former dictator Jerry Rawlings was still president. In addition, Ghana experienced a lot of coups before 1982 when Jerry Rawlings entered in charge, and bribing the opposition leaders was potentially a good strategy for the government to ensure the stability of the country. Then, a promising future paper could be to check the persistence of non-democratic political habits since 2004 and two peaceful legislative and presidential elections in Ghana.

References

- Akramov, K., F. Asante** (2008) Decentralization and Local Public Services in Ghana: Do Geography and Ethnic Diversity Matter? IFPRI GSSP Background paper 16.
- Akyeampong, K., J. Diangmah, A. Oduro, A. Seidu, F. Hunt** (2007), *Access to Basic Education in Ghana: The Evidence and the Issues*, Country Analytic Report, CREATE, 127 P.
- Alesina, A.** (1987) Credibility and Policy Convergence in a Two-Party System with Rational Voters, *The American Economic Review*, 78(4), 796-805
- Alesina A., E. La Ferrara** (2000) Participation in Heterogeneous Communities, *Quarterly Journal of Economics*, 115(3), 847-904
- Aryeetey, E., R. Kanbur** (2008), *Economy of Ghana: Analytical Perspectives on Stability, Growth and Poverty*, James Currey Ltd Publisher, 224 pages.
- Asante F. A., J. R. A. Ayee** (2008), Decentralization & Poverty Reduction, Chap 15 in Aryeetey and Kanbur (eds) *The Economy of Ghana, Analytical Perspectives on Stability, Growth & Poverty*, James Currey Woeli Publishing Services, 423 p.
- Asante, R., E. Gyimah-Boadi** (2004), Ethnic Structure, Inequality and Governance of the Public Sector in Ghana, United Nations Research Institute for Social Development
- Austin G.** (2005), *Labour, Land and Capital in Ghana, From Slavery to Free in Asante, 1807-1956*, University of Rochester Press, 589 p.
- Banful A. B.** (2009) Do Institutions Limit Clientelism? A Study of the District Assemblies Common Funds in Ghana, Communication at the CSAE 2009 annual conference
- Bardan P., J. Dayton-Johnson** (2001), Inequality and the governance of water resources in Mexico and South India, mimeo, Santa Fe institute
- Banerjee, A., R. Somanathan** (2007), The Political Economy of Public Goods: Some Evidence from India, *Journal of Development Economics*, 82(2), 287-314, March.
- Besley T., R. Burgess** (2002), The Political Economy of Government Responsiveness: Theory and Evidence from India, *Quarterly Journal of Economics*, 117(4), 1415-1451
- Boafo-Arthur, K.** (2008), Democracy and Stability in West Africa: The Ghanaian Experience, Claude Ake Memorial Papers no. 4, Uppsala University
- Bossuroy, T.** (2008), Voting in an African democracy: does only ethnicity rule? An empirical assessment on contemporary Ghana, Working paper
- Bowen H.** (1943), The Interpretation of Voting in the Allocation of Economic Resources, *Quarterly Journal of Economics*, 58(1), 27-48
- Case, A.** (2001), Election Goals and Income Redistribution: Recent Evidence from Albania, *European Economic Review*, 45(3), 405-423.
- Chattopadhyay, R., E. Duflo** (2004), Women and Policy Makers: Evidence from a Randomized Policy Experiment in India, *Econometrica*, 72(5), 1409-1443.
- Cole, S.** (2009), Fixing Market Failures of Fixing Elections? Agricultural Credit in India, *American Economic Journal Applied Economics*, 1(1), 219-250.
- Dahlberg, M., E. Johansson** (2002), On the Vote-Purchasing Behavior of Incumbents, *American Political Science Review*, 96(1), 27-40.
- Dayton-Johnson J.** (2000), Determinants of collective action and the local commons: a model with evidence from Mexico, *Journal of Development Economics*, 62(1), 181-208
- Diaz-Cayeros A.** (2008), Electoral Risk and Redistributive Politics in Mexico and the United States, *Studies in Comparative International Development*, 43(2), 129-150
- Downs A.** (1957), An economic theory of democracy, New York, Harper & Row
- Ferraz C., F. Finan** (2007), Electoral Accountability and Corruption in Local Governments: Evidence from Audit Reports, Mimeo

- Finan, F. S.** (2004), Political Patronage and Local Development: A Brazilian Case Study, unpublished manuscript, Department of Agricultural and Resource Economics, UC-Berkeley.
- Foster, A. D., M. R. Rosenzweig** (2001), Democratization, Decentralization and the Distribution of Local Public Goods in a Poor Rural Economy, PIER Working Paper 01-056.
- IMF (2000)**, Ghana: Statistical Appendix, IMF Washington DC, 61 p.
- IMF (2005)**, Ghana: Statistical Appendix, IMF Washington DC, 75 p.
- Jacquemot, P.** (2007), Chefferies et décentralisation au Ghana, *Afrique contemporaine*, 1(22), 55-74.
- Joanis M.** (2008), The Road to Power: Partisan Loyalty and the Centralized Provision of Local Infrastructure, GREDI Working Paper 08-15, Sherbrooke University
- Keefer and Vlaicu** (2008), Democracy, Credibility and Clientelism, *Journal of Law, Economics, and Organization*, 24(2), 371-406
- Khwaja A.** (2002), Can Good Projects Succeed in Bad Communities? Collective action in the Himalayas, Mimeo, Harvard University.
- Lizzeri A., N. Persico** (2001), The Provision of Public Goods Under Alternative Electoral Incentives, *American Economic Review*, 91(1), 225-239
- Morrison, M. K. C.** (2004), Political Parties in Ghana through Four Republics, A Path to Democratic Consolidation, *Comparative Politics*, 36(4), 421-442
- Moser, C.** (2008), Poverty Reduction, Patronage, or Vote Buying? The Allocation of Public Goods and the 2001 Election in Madagascar, *Economic Development and Cultural Change*, 57(1), 137-162.
- Nugent, P.** (1999), Living in the past: urban, rural and ethnic themes in the 1992 and 1996 elections in Ghana, *The Journal of Modern African Studies*, 32(2), 287-319.
- Nugent P.** (2005) Les élections ghanéennes de 2004: anatomie d'un système bipartite, *Politique africaine*, 97, 133-150
- Pande R.** (2003) Can Mandated Political Representation Increase Policy Influence for Disadvantaged Minorities? Theory and Evidence from India, *The American Economic Review*, 92(4), 1132-1151
- Robinson J., R. Torvik** (2005), White Elephants, *Journal of Public Economics*, 89(2-3), 197-210
- Schady, N.** (1999), Seeking Votes: The Political Economy of Expenditures by the Peruvian Social Fund (FONCODES), 1991-95(August 1999), World Bank Policy Research Working Paper No. 2166.
- Shepherd A., E. Gyimah-Boadi with S. Gariba, S. Plagerson & Musa A.W.** (2006), Bridging the North South Divide in Ghana? Background paper for the 2006 World Development Report, the World Bank.
- Tsekpo A, C. D. Jebuni** (2008), Budget Implementation & Poverty Reduction in Ghana, Chap 12 in Aryeetey and Kanbur (eds) *The Economy of Ghana, Analytical Perspectives on Stability, Growth & Poverty*, James Currey Woeli Publishing Services, 423 p.
- Wantchekon, L.** (2003). Clientelism and Voting Behavior, Evidence from a Field Experiment in Benin, *World Politics*, 55(3), 399-422.

Appendix I. DEFINITION OF THE VARIABLES

Difference between shares of votes for NPP and for NDC: Difference between the share of votes for the NPP and for the NDC in the district at the last presidential elections. It takes the value of the 1996 election for the period 1998 – 2000, and of the 2000 election for the period 2000 - 2003

Civil servants: Share of civil servants in the active population

District education: District average of an education variable for individuals aged 25 or more. This variable takes value 0 if the individual has never been to school (but possibly pre-school), 1 if he has begun primary school, 2 if he has finished primary school, 3 if he has been to junior secondary school, 4 if he has been to senior secondary school, 5 if he has been to university.

Electricity supply: Share of the households with an access to electricity in the household

Ethnic heterogeneity in the district: Sum of the squares of the shares of Akan, Ewe, Ga-Adangbe, Others in the district. Included in the [0, 1] interval.

Health centers: Share of the rural population with an access to hospital, health clinic or health centre. The census localities with a hospital, health clinic or health center closer than 4 kms were considered as having a health center in the 2000 facility census. The clusters in which more than 60% of the households mentioned an access to hospital or health clinic closer than 45 mns by foot were considered as having a health center in CWIQ 2003 survey.

Household convenience index: Synthetic variable measuring the comfort of the dwelling. It is the sum of 4 variables, averaged at the district level. The first one takes value one if the cooking energy is charcoal, takes value 2 if the cooking energy is electricity, gas or kerosene, and takes value 0 otherwise. The second variable takes value 1 if the roof is in metal, concrete or asbestos, and 0 otherwise. The third variable takes value 1 if the wall is in stabilized or burnt bricks, concrete or metal. The last variable takes value 0 if the floor is made of earth, 1 otherwise.

Log (population density) The population density is calculated from the 2000 census

Northern regions: Dummy taking value 1 for regions Northern, Upper West and Upper East

NPP candidate minister after 2000 This variable takes value 1 if one or several 1996 legislative NPP candidates in this district were minister(s) at some point between 2000 and 2005. It takes value 0 otherwise.

Knowing the names of each Minister of Kufuor's government from 2001 to 2005, the 1996 legislative results give information about their candidature or not and in which district they have been candidates. Among 37 Ministers, 15 were NPP candidates at the 1996 legislative election and 14 have been elected. 8 out of 15 districts they were candidates, were urban ones (proportion of urban population higher than 50%) and 6 were district capitals.

Public goods aggregate: All the 6 types of public goods (Civil servants, Electricity supply, Health centers, Primary schools, Secondary schools and Water supply) were transformed by linear transformation to have a mean of 0 and a standard error of 1, so as to ensure comparability between public goods. The public goods aggregate is the sum of these 6 variables.

Primary schools: Share of the rural population with an access to primary school. The census localities with a primary school closer than 4 kms were considered as having a primary school

in the 2000 facility census. The clusters in which more than 60% of the households mentioned an access to primary school closer than 45 mns by foot were considered as having a primary school in CWIQ 2003 survey.

Secondary schools: Share of the rural population with an access to secondary school. The census localities with a secondary school closer than 4 kms were considered as having a primary school in the 2000 facility census. The clusters in which more than 60% of the households mentioned an access to secondary school closer than 45 mns by foot were considered as having a primary school in CWIQ 2003 survey.

Share of Akan in the district

Share of Asante in the district It is calculated from the 2000 census

Share of Ewe in the district

Share of urban population It is calculate from the 2000 census. The definition of an urban locality in Ghana is that its population is above 5000 inhabitants.

Water supply: Share of the households with any access to tap water in the district

Data sources

Data	DHS 1998	GLSS4 1998	CWIQ 2003	DHS 2003	Census 2000
date	Nov. 98 – Feb. 99	Apr.98- Mar.99	Jan. 03 – May 03	Jul. 03 – Oct. 03	March 2000
Sample size	6,003	6,009	39,584	6,251	379,372
(# of households)					
# of clusters	400	300	3,267	412	

Appendix II. WATER AND ELECTRICITY SUPPLY POLICIES IN **GHANA**

Water Supply

The Community Water and Sanitation Agency²⁶ that comprises a head office and 10 regional offices is the agency through which the majority of funds to the water sector are channeled and coordinated (around 88% of total funds from 2001 to 2006). Since 1994, Ghana has launched national Community Water and Sanitation Program (CWSP-1 1994-1999, CWSP-2 1999-2004) which are based on a demand-driven, community-driven approach. The principle underlying that a five percent community contribution to capital cost for water facilities has normally to be applied for every investment in the water sector. However, according to World Bank (2008), there are variations in the interpretation and eventual application of the policy.

Electricity Supply²⁷

Two main operator produce electricity: the Electricity Company of Ghana, and the Volta River Authority (VRA) that is in charge of the hydro power stations within the Volta Basin. The VRA is also mandated to distribute electricity in the North of Ghana. This led to the creation in 1987 of the Northern Electricity Department. By the end of 1997, two key regulatory institutions were created by acts of Parliament: the Public Utilities Regulatory Commission (PURC) and the Energy Commission (EC). Whereas, the Ministry of Energy is responsible for the broad policy direction, the PURC is in charge of economic regulation, ensuring fair competition among utilities and monitoring quality service. The EC is responsible for indicative national planning, licensing of electricity utilities and technical standards. These two regulatory bodies were created to establish the required conditions imposed by the World Bank to improve operational efficiency, transparency and independence from Government of the electricity sector. The two state-owned generation and distribution utilities (ECG and VRA) have benefited from significant debt reliefs from the government as from international donors. Despite structural reforms, government and international supports, Ghana's electricity distribution sector is bedeviled from several problems including poor infrastructure, managerial problems that have led to high system losses, severe liquidity problems... It is said that limitations on electricity services limit economic growth and may contribute to social issues.

²⁶ Nevertheless, other institutions are in charge of the sector: Ghana Water Company Ltd (GWCL) and the Water Resources Commission (WRC). [A water Directorate has been established within the Ministry of Water Resources, Works and Housing to coordinate the activities of all sector institutions].

²⁷ All the information included in this paragraph comes from RCEER (2005).