Tracking Neopatrimonialism

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The Political Economy of Social Infrastructure Provision in Zambia

Paper presented at the
ECAS 2011 - 4th European Conference on African Studies
"African Engagements: On Whose Terms?"
Uppsala, Sweden
15-18 June 2011

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Abstract

This paper contributes to the growing literature of patronage politics in emerging democracies. I assess the extent to which the ruling party in Zambia employs patronage politics in public spending to strengthen its political power base and maintain clientelistic networks at the local government level. I argue that existing patronage networks have adapted to the emergence of basic democratic institutions, thus maintaining neopatrimonial structures despite of formal regime change. In the absence of reliable data on public expenditure in Zambia, I use household level data on access to infrastructure from the Zambia Living Conditions Monitoring Survey as a proxy for public sector investment. Using traditional regression methods as well as propensity score matching of constituencies, I find a high correlation between ruling party dominance of local councils and improvements in access to infrastructure. I find significantly stronger improvements of access to health facilities in government party dominated constituencies, indicating that central government targets investment in health infrastructure to local strongholds. Thus, my findings for Zambia differ fundamentally from evidence for Western democracies where public spending is often found to be biased towards contested constituencies to optimize electoral outcomes. Political elites in neopatrimonial regimes seem to use public resources to maintain local clientelistic networks in political strongholds rather than to maximize votes in particularly contested constituencies.

1 Introduction: Aid and the Political Economy of Public Finance

This paper is part of a wider research effort on the political economy of public finance in developing countries. The main purpose is to empirically track patronage and evidence of clientelistic spending in public finance in Zambia as a typical aid receiving country. To circumvent the problem of poor data availability on public spending encountered in most Sub-Saharan African countries, it proposes the use of household level data on access to infrastructure as a proxy for public investment. The empirical analysis applies a propensity score matching approach at constituency level to control for possible endogeneity problems stemming from voting behavior along regional, ethnical, or poverty patterns.

1.1 Aid Effectiveness and the New Interest in Public Finance in Developing Countries

Over the past 10 years or so, there has been an enormous increase of interest in public finances in developing countries. To a substantial extent, this interest has been driven by Western aid agencies and researchers concerned with the effectiveness of development aid (Leiderer / Wolff 2007). This is not least due to a fundamental paradigm shift among Western donors who - after nearly four decades of 'traditional' project-based development aid - have come to realize that aid resources that circumvent recipient countries' own systems for planning, implementation and control of public resources will in most cases only produce only locally and temporarily limited effects on poverty levels or other indicators of development (Faust / Leiderer 2008).

As a consequence of this insight, various bi- and multilateral aid agencies in 2005 have endorsed the Paris Declaration on Aid Effectiveness. Besides formulating five principles for more effective aid, the Paris Declaration proposes so-called 'programme-based approaches' (PBAs) as the modality of choice to provide development aid to poor countries.[1] Most prominent - and by far most controversial - among the various forms

[1]The OECD/DAC defines PBAs as a way of engaging in development cooperation based on the principles of coordinated support for a locally owned programme of development, such as a national development strategy, a sector programme, a thematic programme or a programme of a specific organisation. Programme-based approaches share the following features: (i) leadership by the host country or organisation; (ii) a single comprehensive programme and budget framework; (iii) a formalised process for donor

of PBAs suggested is the provision of direct budget support, which involves the support of national development and poverty reduction strategies in developing countries by means of direct financial support to recipient governments' national treasuries, instead of funding hundreds or thousands of isolated projects of uncertain relevance to the countries' specific development needs (OECD-DAC 2008, 22.).

The main controversy among donor agencies with regard to budget support as an aid instrument stems from different views on the fiduciary risks involved in providing aid through recipient countries' budgetary systems, i.e. the risk that donor funds are not (or not efficiently) used for the purposes intended by the donor.[2]

The increased attention paid to these risks inherent in poor countries' public financial management systems has resulted in the development of various analytical tools by donor agencies to assess the quality of these systems (Leiderer 2005). These diagnostic tools and other - mostly qualitative - approaches to assess the quality of public financial management systems in aid recipient countries, in turn, have resulted in a vast amount of reports and studies on the performance and political determinants of public spending. By far the largest proportion of these analytical studies focus on Sub-Saharan African countries (de Renzio / Andrews / Mills 2010, 40).

The central tenet of this body of - mostly 'grey' - literature is that PFM systems in Sub-Saharan Africa are severely hampered by particular features of the African state usually subsumed under the concept of neopatrimonialism. Key features of neopatrimonial systems are the concentration of power in the hands of a small elite and in particular the head of state with few effective checks and balance mechanisms and horizontal or vertical division of power; the capture of public resources by these elites to maintain extended clientelistic networks and patronage systems; and the superseding (or hybridisation)[3] of formal institutions and processes in the public administration by informal and personalized institutions, rules, and relations (Leiderer et al. 2007).

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co-ordination and harmonisation of donor procedures for reporting, budgeting, financial management and procurement; (iv) efforts to increase the use of local systems for programme design and implementation, financial management, monitoring and evaluation' (OECD-DAC 2008, 22).

[2]For a comprehensive overview of the use of budget support as an aid instrument, see Koeberle / Stavreski / Walliser (2006); for a short overview of the political debate around budget support in donor countries, see Leiderer (2009).

[3]Erdmann / Simutanyi (2003).

1.2 The Difficult Empirics of the Political Economy of Public Finance in Developing Countries

A relatively large body of economic literature addresses the political economy of public spending, in particular in modern democracies. Most of this literature is concerned with the empirical testing of the central tenet of of Downs' seminal *Economic Theory of Democracy* (Downs 1957) that "*political behaviour in a democracy can be understood as a rational effort to maximize the prospects of electoral success*" (Wright 1974, 30).

One important strand of this literature, building on early work such as Nordhaus (1975), MaRae (1977), Hibbs (1977), and Tufte (1978),[4] is concerned with the existence of political budget cycles. This literature has tried to explain how governments use expansionary fiscal and monetary policy in the run-up to elections in order to increase the chances of being re-elected (Blaydes 2008, 1). The empirical literature on political budget cycles has until recently - with a few exceptions - focused mostly on advanced industrial countries (Shi / Svensson 2006, 1368). Evidence for the existence of electoral budget cycles, however, has been mixed in both industrialized and developing countries (Blaydes 2008, 1). More recent research does find evidence for electoral budget cycles (e.g. Persson / Tabellini 2002), but also finds strong indications that the nature of such cycles differs substantially between developed and developing countries (Shi / Svensson 2006).

There is both empirical evidence as well as theoretical arguments why such differences should exist. Shi / Svensson (2006) propose a moral hazard model of electoral competition to explain these differences: They find that the size of the electoral budget cycles depends on politicians' rents of remaining in power and the share of informed voters in the electorate. However, as this literature usually concentrates on fiscal cycles at a macro-economic level, it does not allow for more detailed analysis of the underlying mechanics of politically motivated public spending in neopatrimonial systems.

A related but differently focused strand of research is concerned with the distribution of politically motivated public spending between social groups and geographic or administrative units. Most of the empirical work on this topic also focuses on OECD

[4] See Shi / Svensson (2006), 1368.

countries, above all the United States.[5] The general conclusion of this literature is that a disproportionate share of federal spending under the New Deal went to the potential swing states (Couch / Shughart 1998).

Some more recent work has also studied cases in developing countries, particular in Latin America. For instance, a number of studies investigate the role of patronage politics in Mexico's PRONASOL poverty-relief programme, for instance Molinar Horcasitas / Weldon (1994), Hiskey (1999), Magaloni (2006): These empirical studies basically test two alternative theories about the political logic of the geographical distribution of government spending, based on two competing models of how patronage politics determine the allocation of funds across beneficiaries: Swing-voter models of distributive politics (Lindbeck / Weibull 1987, Dixit / Londregan 1996), which argue that public expenditure is employed to "buy back opposition voters"; and core-voter models (Cox / McCubbins 1986), which propose that government spending is used to "reward the loyal municipalities".

While the former (in line with empirical findings on New Deal spending in the US) suggests that public expenditure should target particularly contested constituencies where the potential electoral payoff is largest, the latter suggest that government spending should be targeted at places where the incumbent party received more votes in the past (Magaloni 2006, 123 f.).

From a "neopatrimonial perspective" both models seem to have at least some theoretical merit: while staying in power certainly is a major motivation for an incumbent elite, the need to maintain a wide network of loyal "clients" through patronage may also play an important role in determining the distribution of discretionary spending.

For the Mexican PRONASOL programme, the evidence on this controversy is somewhat inconclusive: While Hiskey (1999) finds evidence for the core-voter theorem, Magaloni (2006), after controlling for a simultaneity problem stemming from electoral outcomes being influenced by expenditures in earlier periods, finds evidence for the swing-voter model in Mexico's PRONASOL programme.

But it is not only endogeneity problems of this kind that lead to such inconclusive

[5] E.g. the extensive work on New Deal spending in the 1930s by - among others - Wallis 1998, Wallis 1984, Arrington 1969, Reading 1973 and Anderson / Tollison 1991.

and contradictory evidence on the actual patronage mechanisms at work in developing countries. The main empirical difficulty in studying the political economy of public finance in neopatrimonial or autocratic systems is the extremely limited availability of reliable data on government expenditure in poor countries.[6] As Reinikka / Svensson (2004, 679) emphasize, official budget data are typically the only source of information on public spending in low-income countries and typically predict the resources and services actually received by the intended beneficiaries very poorly. This is particularly true for Sub-Saharan African countries, where fiscal data is notoriously unreliable.

Thus, while there is a good amount of 'narrative' work on the impact of neopatrimonial features of government systems on the quality of public financial management in Sub-Saharan Africa (e.g. Leiderer et al. 2007), rigorous empirical analysis of the political economy of public spending in Sub-Saharan Africa is extremely scarce.

As a remedy for this empirical problem, this paper proposes an approach to assess the extent of neopatrimonial, or clientelistic, government spending in the case of a 'typical' Sub-Saharan country such as Zambia, employing an alternative source of data from national household surveys.

Before turning to the empirical approach and data used, the subsequent sections outline why Zambia lends itself as a case study to empirically track patronage in public finance in neopatrimonial systems.

2 Background: The Case of Zambia

It is a common perception that many African states at the turn of the millennium share similar features such as patrimonial and charismatic forms of rule that continue to exist behind a facade of a (mostly weakly) functioning administrative state (Tetzlaff / Jakobeit 2005, 135). These features, it is argued, have led to the emergence of - in many ways similar - 'hybrid regimes' (Diamond 2002) shaped by competing formal and informal institutions. Various authors argue that Zambia is a typical case of this 'hybridisation' (e.g. Erdmann, G. / N. Simutanyi 2003).

[6] Magaloni (2006), for instance, notes that it took three years to collect their database on municipal-level spending and that, still, their figures represent only an approximation of government expenditures.

2.1 The Political System of Zambia - a Showcase of Neopatrimonialism?

After Zambia gained independence from British colonial rule in 1964, the country experienced a relatively short period of multiparty democratic rule (commonly referred to as the 'First Republic') and was celebrated as a model for peaceful democratic change on the African continent (Bratton: 1992, 81). In his first years in office, the First Republic's president Kenneth Kaunda formulated a socialist and anti-colonial ideology to forge a national identity under the slogan "One Zambia - One Nation", aimed at overcoming tribal fragmentation and building a broad power base (Burnell 2001, 245). When it became clear in 1972, however, that this policy had failed, Kaunda proclaimed a one-party state banning all political parties apart from his UNIP. This step was facilitated by the fact that, even though the First Republic had been formally based on a Westminster-style parliamentary system, the constitution granted the president extensive executive powers with few provisions for effective parliamentary or juridical control.

This 'Second Republic', officially coined a "one-party competitive system", has been described as a "mild dictatorship" or a "weakly authoritarian state" (Erdmann / Simutanyi 2003, 4). Although formally a one-party-state, the political system during this period was marked by the president's personalised style of decision-making and cronyism as the executive power was concentrated in the Office of the President rather than in the Party's Central Committee.

It was not before 1990, when leaders of the Zambia Congress of Trade Unions (ZCTU) and former UNIP members founded the Movement for Multiparty Democracy (MMD) that pushed President Kaunda to accept a number of democratic changes, including the reintroduction of multi-party parliamentary and presidential elections in 1991, in which the MMD secured nearly 75% of the votes and Frederick Chiluba was elected President of what was to become the 'Third Republic'.

Chiluba soon began to re-centralize political power and to build his own one-party-dominant system based on the MMD with any emerging democratic structures heavily constrained by a lack of checks and balances as well as centralist patronage structures. Thus, the Third Republic continued to be shaped by authoritarian tendencies and neopatrimonial practices (Erdmann / Simutanyi: 2003, 76).

Democratization only gained new momentum in 2001, when Chiluba failed to secure a third consecutive presidential term and his party fellow Levy Patrick Mwanawasa became the MMD presidential candidate.[7] After having won the presidential race in 2001 that were plagued by irregularities, lost ballot-boxes and political intimidation,[8] he also won the elections in 2006, which were considered as free and fair. After his sudden death in 2008, the MMD again won the subsequent elections by regular means. Consequently under the actual presidency of Rupiah Banda the country can be called an electoral democracy, while at the same time important neopatrimonial features persist, such as limited political transparency and widespread political corruption, which constrain democratic voice and accountability (Faust 2009).

2.2 Decentralization in Zambia

One identifying feature of neopatrimonial systems is a lack of effective vertical separation of powers that would impose limits on the extent to which elites in central government positions can use public resources to maintain clientelistic networks and to mobilize political support at local level. Therefore, the degree of political, administrative, and fiscal decentralization is a key factor for the scope of neopatrimonial practices in a state.

Against the background of the overall political development sketched above, Zambia has remained a late-comer with regard to decentralization reforms, and particularly fiscal decentralization remains very weak in Zambia.

Administratively, Zambia is divided into nine provinces (Central, Copperbelt, Eastern, Luapula, Lusaka, Northern, Northwestern, Southern and Western, map in Annex). These provinces are further divided into 72 districts, which in turn are divided into 150 constituencies and 1207 wards.

At the district level, local councils are elected by popular vote.[9] However, the political autonomy of councils remains weak, as mayors have only representative functions. Sec-

[7] In 2007, former President Chiluba was formally charged with embezzlement of 500.000 US$ of public funds for private purposes, but allegations against him were lifted in August 2009 (Transparency International 2008, 154-155).

[8] The Supreme Court took up investigations, but later removed the uncertainty over Mwanawasa's presidency (Erdmann 2007, 487).

[9] In addition, Members of parliament and ministers are ex-officio members of their constituencies' local councils.

tor policies are carried out almost exclusively by central sector ministries' deconcentrated structures in the districts. These are coordinated by district commissioners nominated by the President's Office. The province level is a purely administrative tier without any legislative body or autonomous powers when it comes to budget allocation decisions.

With regard to fiscal decentralization, plans to establish a transparent and rules-based integrated fiscal transfer system have been stalled to date, in particular as Cabinet repeatedly refused to adopt the Decentralization Implementation Plan, developed in 2006, that is supposed to put decentralization policy in practice. The DIP was finally approved in December 2009 and in the 2010 budget, for the first time, an allocation formula for a number of transfer mechanisms to the district level has been introduced. Yet, this formula will most likely first and foremost affect distribution rather than the overall amount of transfers to the local government level.

In addition, local sources of public revenue have been gradually withdrawn since the 1970s, and the possibilities of income generation at local level are considered to be very low and inadequate to deliver the mandated services (Ministry of Finance and National Planning of the Republic of Zambia: 2008, 11).

As a result of this policy, the share of local government spending in total public expenditure in Zambia is almost negligible. Very few concrete and reliable data are available on the amount of transfers reaching the municipalities; yet estimates show that transfers to local government entities amounted to less than 3% of central government spending by the mid of the current decade. These transfers are almost entirely used for administrative cost of local councils and very little money is available for capital expenditure such as investment into local infrastructure.[10]

As a consequence, local governments in Zambia depend almost entirely on central government to improve the economic infrastructure and living conditions in their local area. This setup, of course, is in line with the general logic of a neopatrimonial state where power and resources remain highly concentrated at the central level and are dispensed at the discretion of the ruling elite in return for political loyalty and support.

[10] An exception to this is the Constituency Development Fund (CDF), through which resources in form of a fixed block grant are transferred to each constituency. The CDF was introduced in 2006 and since its inception, Parliament has continuously increased the amount received by each MP for his/her constituency from an initial 60.000.000 Kwacha, to 600.000.000 Kwacha (roughly 90.000 Euro) in 2009.

3 An Empirical Approach to Track Patronage and Clientelistic Spending in Zambia

Detailed data on public expenditure in Sub-Saharan African countries is notoriously scarce and inaccurate. At the same time, various African countries have well-established databases on household-level living conditions based on regularly conducted Living Standards Monitoring Surveys (LSMS).

The main interest of this paper is in demonstrating the usability of such household level data in assessing whether the central government in 'typical' neopatrimonial state such as Zambia uses public spending at local government level as a political instrument to strengthen its power base among the electorate. As a first application, the remainder of this paper employs data from Zambia's Living Conditions Monitoring Surveys to test whether there is evidence in support of the core voter model in Zambia, as the concept of neopatrimonialism would suggest.

3.1 Empirical Question and Approach

To test this hypothesis, I want to examine to what extent public spending is specifically targeted at areas or groups that have previously supported the ruling party at the polls. This, I argue, can be interpreted as an indicator for the extent of neopatrimonial practices and patronage politics.

As explained in Section 1.2, this argument differs somewhat from the classical argument that public spending primarily serves to win over swing-voters: While most literature on the political economy is based on the hypothesis that public spending spending is instrumentalized by the incumbent party or politician ahead of elections to optimize electoral outcomes and should thus be targeted towards the most contested constituencies, the concept of neopatrimonialism would imply that government spending is rather used ex-post to reward the incumbent's supporters for their loyalty (which, in turn, of course will ensure continued support by this group in the future).

Therefore, other than for example argued by Wright (1974:31), who suggests that New Deal spending should have no value in 'secure' states but rather be concentrated on particularly contested states, the core-voter model in a neopatrimonial system would

suggest that government spending should be highest in areas where the incumbent enjoys strongest support.[11]

Unfortunately, like in most African countries, there is very little detailed - leave alone reliable - data on public spending at a disaggregated level in Zambia to test this hypothesis. This not only applies to government spending out of the national budget; as in all aid dependent countries, significant amounts of public spending in Zambia are channeled outside government systems, e.g. by international donor agencies or non-governmental organizations that carry out projects and programmes at various levels and in different sectors in the country. While the latter does not imply that central government has no control whatsoever over the allocation of these resources, there usually is no unified and publicly available reporting system on this type of expenditure. What is more, both governments as well as donors are usually rather reluctant to publish this kind of information.

To circumvent the problem of data availability, I propose an indirect measure of public spending, namely data collected at household level on access to (mostly publicly funded) infrastructure such as schools or health facilities. This kind of data is available from Living Condition Monitoring Surveys conducted in a number of African countries, including Zambia.

3.2 Data

3.2.1 The Zambia Living Conditions Monitoring Survey

Like various other African countries, in the 1990s Zambia began to carry out regular large-scale Living Conditions Monitoring Surveys (LCMS) based on the World Bank's LSMS[12] methodology to monitor the impact of government and donor policies and programmes.

In Zambia, five LCMS have been conducted by the Central Statistics Office since 1996 (1996, 1998, 2002/3, 2004, 2006). The nation-wide surveys are carried out in all of Zam-

[11] Obviously, other factors, in particular the specific electoral system can be expected to play a crucial role in this as well, for instance, whether the president is elected directly or indirectly (On the influence of electoral systems on fiscal policy, see for example Funk / Gathmann 2009). However, the electoral system itself is clearly not entirely exogenous to the political process and can be argued to be itself an outcome of the neopatrimonial structures. This issue is, however, beyond the scope of this paper.

[12] Living Standards Measurement Study

bia's 72 districts on a cross-sectional sample basis[13] with the main objectives to:[14]

(i) monitor the effects of government policies on households and individuals.

(ii) measure and monitor poverty overtime in order for government to evaluate its poverty reduction programs.

(iii) monitor the living conditions of households in Zambia in the form of access to various economic and social facilities and infrastructure and access to basis needs; food, shelter, clean water and sanitation, education and health, etc.

(iv) identify vulnerable groups in society.

The LCMS is designed to provide data for each and every district in Zambia based on a sample of 1,000 Standard Enumeration Areas (SEAs), covering approximately 20,000 households. In addition to household level data the LCMS contains some information on the enumeration areas, e.g. whether they are located in a rural, municipal or city district.

In its latest (2006) version, the LCMS questionnaire covers the following areas: Demography and Migration; Orphanhood; Health; Education; Economic Activities; Income; Household Expenditure; Household Assets; Household Amenities and Housing Conditions; Household Access to Facilities; Self-assessed Poverty and Household Coping Strategies; Household Agricultural Production.

Access to Infrastructure The section 'Household Access to Facilities' of the LCMS records distances (in km) to the next facility of different types of infrastructure for each household (independent of whether these facilities are actually used by household members). Table 7 in the Annex gives an overview of the types of facilities included in the LCMS questionnaire since 1998[15] with the respective distances for the 1998 survey.

For the purpose of this paper I am primarily interested in infrastructure provided by government (or international donors with the placet of government) and benefit the general population.

I therefore construct two combined indicators that include different types of facilities: one

[13]The 2002/3 survey was conducted as a longitudinal survey to collect data over a period of 12 months.
[14]CSO 1999, 2
[15]In subsequent years changes to the questionnaire included adding public phones and internet cafes as well as a distinction between different types of primary schools.

general infrastructure indicator calculated as the sum of distances to all facilities recorded in the 1998 LCMS; and one 'social infrastructure' indicator that includes only health facilities and (all types of) of basic schools (see Table 1).

To obtain these indicators, I first calculate for each of the selected facilities the (unweighted) average distance to the next facility for all households within a constituency in 1998 and 2006,respectively. This serves as a measure for the level of infrastructure availability in the 150 constituencies at the two points in time. By taking differences between these observation points, I then calculate improvements in access to infrastructure at constituency level between 1998 and 2006.

As health and education are of particular interest with regard to poverty reduction and living conditions (and are thus particularly relevant for donors providing budget support, too), I also calculate a combined indicator for access to social infrastructure by summing the distance to the nearest health facility and distance to the nearest primary school.[16]

A summary of the calculated changes in access to infrastructure are shown in Table 1, where a positive value stands for a reduction in distance, i.e. an improvement in terms of access. For instance, on average the constituency-level mean distance to the next health facility was reduced by 1.83 km between 1998 and 2006. The constituency with the largest improvement in average household access to health facilities in the sample experienced a reduction of the average distance to the next facility by 60.90 km; the worst deterioration increased the average distance of households in a constituency to the next health facility by 26.99 km.

Table 1 shows that overall improvement in access to infrastructure has been modest in the period 1998-2006, and particularly so in access to social infrastructure. Yet, the figures also indicate substantial heterogeneity in the changes experienced by individual constituencies. This, of course, raises the question to what extent this heterogeneity is politically motivated in line with the arguments made above.

[16]In the 2004 and 2006 surveys primary schools different types of primary education facilities can be identified (community schools, primary schools up to grade four, primary schools up 7 and primary schools up to grade 9). Since the 1998 LCMS does not provide this detailed classification, it is not possible to differentiate between these types in calculating differences between 1998 and 2006. Therefore, in 2006 the closest primary school for each household is selected, independent of its type.

Table 1: Improved Access to Infrastructure 1998-2006*

Facility	min	max	mean
Health	-26.99	60.90	1.83
Food market	-34.94	74.20	5.14
Basic education	-19.86	34.27	0.06
Secondary school	-79.92	62.88	-1.66
Mill	-33.32	81.90	4.25
Transport	-24.80	73.57	2.26
Police	-43.02	86.24	5.73
Post	-57.23	69.62	0.81
Bank	-74.79	88.10	9.20
Input Market	-68.6	73.33	10.46
Social	-46.85	95.17	1.89
All	-262.97	626.4	34.07

*(mean distance reduction in km per constituency)

The combined indicator for all types of infrastructure includes various facilities that can be expected to be provided at least partly by the private sector (hammer mills, banks, input and food markets).[17] The social infrastructure indicator (health and - to a lesser extent as shall be explained further on - basic education) should thus provide a better proxy indicator to measure differential public spending given that this kind of infrastructure is predominantly provided by the public sector. Therefore, I argue that the latter indicator can serve as a proxy for public investment in infrastructure (either from central government or donor projects).[18]

Poverty Under the heading 'Household Expenditure' the LCMS records household expenditure on different items, including a basic needs basket that defines the poverty line. By establishing the sham of households (weighted by household size) whose monthly expenditure is below the price indicator for this basket, measures for poverty incidence (poverty headcount) as well as for poverty severity and the poverty gap are calculated. Table 2 shows the poverty headcount for the nine regions of Zambia in 1998.
Evidently, the distribution of poverty across provinces is very uneven. For the purpose of this study, this might pose a serious difficulty, if voting behavior is driven by poverty

[17]For input and food markets, the role of the public sector is, however, usually quite large, as in most parts of Africa these markets are commonly regulated to locate in publicly provided market spaces.

[18]The average distances suggest that the next facility of a certain type does not always lie within the same constituency. However, apart from the distance to be traveled this does not make any difference for the household who uses the facility. It seems safe to assume that the government will locate facilities in such a way that, if possible, they benefit a maximum of targeted constituencies at the same time.

Table 2: Poverty Incidence by Regions 1998

Province	Percentage Poor	Total Population
Central	77	1,016,000
Copperbelt	65	1,824,000
Eastern	80	1,296,000
Luapula	81	698,000
Lusaka	52	1,527,000
Northern	81	1,226,000
North-Western	76	546,000
Southern	76	1,287,000
Western	89	748,000
Total	73	10,168,000

Source: LCMS 1998

rates and/or regional/ethnical divisions. If this is the case, then, for example, it would not be straightforward to distinguish between public spending targeting particularly poor constituencies or those that exhibit a particular voting pattern. This issue is picked up in Section 3.3.2.

3.2.2 Election Data

The 2009 Freedom House Index rates Zambia as an electoral democracy with democratic institutions such as competitive, multiparty elections, universal adult suffrage and open public access for political campaigning in place. Detailed information on election outcomes is available from the website of the Electoral Commission (EC) of Zambia. [19] The available data covers election results for presidential and parliamentary elections since 1991 and for local government (council) elections since 2001, all of which regularly take place every five years.[20]

Parliamentary Elections The National Assembly of Zambia has 158 members, of which 150 are elected in constituencies of roughly similar population and 8 are nominated by the President of the Republic. Election results are reported at constituency level and include information on party membership of the elected Member of Parliament (MP) from that constituency.

[19] www.elections.org.zm

[20] In 2008, after the sudden death of President Mwanawasa, presidential by-elections were held and won by former Vice President Rupiah Banda in October 2008. The next regular elections will take place in 2011.

In the 2001 parliamentary elections, the ruling party won only 69 out of the 150 seats. The remaining 81 were distributed between 6 opposition parties and independent candidates. This picture did not change dramatically in the 2006 elections, when the MMD won 73 seats.[21]

For the purpose of this paper, it is of interest whether a given constituency forms part of the ruling party's local powerbase or not. As a measure for this, a dummy variable for whether a constituency has voted in majority for a MMD candidate in the 2001 elections is constructed.

Presidential Elections The President of the Republic is elected by popular vote for a five-year term and is only eligible for one second term. The EC reports results for presidential elections at the level of constituencies, allowing for tracing the political support the ruling party enjoys at this level.

Based on this information a dummy variable is constructed taking the value one if in a given constituency a majority has voted for a MMD candidate in the 2001 presidential elections, and zero otherwise.

Local Government Elections 2001 There are 72 local councils in Zambia. In local government elections the populace elect councillors who represent the electorate on the respective district, municipal or city council. Council size varies between 12 and 30 elected councillors, according to the number of wards into which the constituencies within the district are subdivided.[22]

Data on local government election outcomes for 2001 provide detailed information on the number of votes won by each candidate in each ward. I have retrieved data on results from the 2001 local government elections for each ward within each constituency and district. Since the lowest level of government with at least some legal power to decide on allocations and investment is the council at district level, I want to determine whether the council forms predominantly part of a presumed clientelistic network of the ruling party or not. For this, I aggregate election results at council level by constructing a dummy variable that

[21] Note that because of the 8 nominated Members, the government still holds the majority of seats in the National Assembly since 2006.

[22] The respective constituencies' MPs as well as representatives of traditional authorities (chiefs) are ex-officio members of the council.

has the value one if MMD councillors have a majority in a council, and zero otherwise.[23]

Table 3 shows the distribution by province of constituencies carried by the ruling MMD as indicated by the dummy variables in each of the three elections in 2001.

Table 3: Constituencies with Majorities for MMD Candidates in 2001 Elections

Province	Presidential	Parliament	Local Government*	out of
Central	7	7	9	14
Copperbelt	20	20	22	22
Eastern	1	1	0	19
Luapula	14	13	14	14
Lusaka	1	1	1	12
North-Western	3	3	6	12
Northern	21	20	21	21
Southern	0	1	1	19
Western	1	3	8	17
Total	68	69	82	150

*Number of constituencies in districts with MMD dominated council.

The uneven distribution across provinces of constituencies with a MMD majority suggests that voting in Zambia follows specific regional patterns, i.e. it seems that MMD has a number of regional strongholds (Copperbelt, Luapula, and Northern), while in other provinces it commands only meagre support. Interestingly, as Table 4 shows, there is no indication of a substantial rural-urban divide of the electorate in the 2001 election results.[24]

Table 4: Council Majorities by District Type 2001

Majority	Rural	Municipal	City	Total
Opposition	42	18	8	68
Government	58	15	9	82
Total	100	33	17	150

[23]One could argue that the effect I am interested in could vary with the number of MMD councillors on a council rather than with a binary measure of whether they represent the majority of councillors in the council. For the sake of simplicity of the analysis and in view of the data restrictions I am interested in having a binary treatment variable and abstract from possible heterogeneous treatment. In addition, I do not account for the MPs represented in the council as I am more interested in the local power base of the ruling party than in actual decision making processes at local level. Taking MPs into account in the calculation of my dominance dummy would most likely tend to overestimate the relative local support for the winning parties.

[24]In the 2006 elections, the MMD reportedly lost most city councils.

3.3 Empirical Findings

3.3.1 Electoral Outcomes and Access to Infrastructure

The main empirical question of this paper is whether constituencies that voted predominantly for the ruling party (MMD) in the 2001 elections have benefitted more than proportionally from public infrastructure investment between 1998 and 2001. As there is no comprehensive or reliable data on expenditure, household level information on changes in access to infrastructure is used as a proxy for public investment.

Due to data availability it is not possible to match observation points for changes in access to infrastructure exactly with the terms in office of the President, MPs and Councillors elected in 2001. Although at least at national level the ruling MMD has been in power since 1991, majority patterns at constituency level may well have looked different between 1998 and 2001 from the results for the 2001 elections. This potential problem could partly be remedied by accessing the 1996 LCMS and calculating changes until 2006, which would correspond to exactly two electoral periods. However, since local government election results are only available from 2001, the time span 1998-2006 seems more appropriate, accepting the risk that different majorities at constituency level prior to 2001 would not be accounted for.

As a first step in the analysis, I run simple OLS regressions of the differen indicators for infrastructure access on the MMD majority dummy variables as well as a number of controls, namely the constituency poverty headcount in 1998 as well as dummy variables indicating different degrees of urbanization and regional (province) dummies.

For the combined indicator including all types of infrastructure, among the three voting outcome variables only the local government dummy has a significant positive coefficient. Neither presidential nor parliamentary majorities are significant at conventional levels. This pattern applies to all estimated models, except for Model 2 where the dependent variable is access to a maize mill. This model yields a significant coefficient for both, presidential as well as parliamentary elections for access to hammering mills (albeit with opposite signs), but not for local council majority. [25]

[25] There does not seem to be a straightforward explanation for this result and it surely deserves further exploration. One possible cause might be that investment in mills is closely linked to the controversial and reportedly poorly targeted fertilizer support programme (FSP) introduced in 2002. The FSP has been widely criticized by donors as an ineffective programme that mainly serves clientelistic purposes. This,

Table 5: OLS Changes in Access to Infrastructure

	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent Variable	All Infrastructure[a]	Maize Mill	Social Infrastructure[b]	Social Infrastructure[b]	Health Facility
President MMD	-26.12	-22.27***	-4.34		
	(51.43)	(6.67)	(7.69)		
MP MMD	-64.83	13.73**	2.72		
	(44.86)	(5.82)	(6.71)		
Council MMD	112.16***	6.43	15.15***	14.96***	10.33***
	(37.95)	(4.92)	(5.68)	(4.75)	(3.13)
Municipal	-9.70	-2.33	-6.97	-.65	0.23
	(23.83)	(3.09)	(10.69)	(3.54)	(2.33)
City	-21.02	2.99	-.71	-4.30	-1.66
	(38.87)	(5.04)	(3.57)	(5.77)	(3.81)
Poverty	63.98	-17.21*	-4.26	-8.07	-3.36
	(71.47)	(9.27)	(5.81)	(10.45)	(6.89)
Copperbelt	-64.93	-3.24	-15.56**	-16.34**	-13.17***
	(45.55)	(5.91)	(6.81)	(6.52)	(4.30)
Eastern	41.77	-5.14	2.82	3.44	1.07
	(43.49)	(5.64)	(6.50)	(6.36)	(4.19)
Luapula	16.48	10.07*	-1.79	-2.68	-2.62
	(44.82)	(5.82)	(6.70)	(6.38)	(4.20)
Lusaka	44.34	-4.07	-.67	-.31	-0.26
	(50.25)	(6.52)	(7.52)	(7.44)	(4.90)
Northern	-11.36	1.50	-6.12	-6.98	-7.03*
	(40.98)	(5.32)	(6.13)	(5.76)	(3.80)
North-Western	59.760	-3.37	-2.14	-1.77	-0.74
	(42.92)	(5.57)	(6.42)	(6.29)	(4.15)
Southern	44.88	-4.36	3.96	4.77	1.21
	(43.00)	(5.58)	(6.43)	(6.21)	(4.09)
Western	83.64**	12.61**	16.47**	17.57***	11.07***
	(42.48)	(5.51)	(6.35)	(5.88)	(3.88)
Intercept	-77.32	17.69**	1.18	1.36	0.63
	(65.47)	(8.50)	(9.79)	(9.72)	(6.41)
Observations	149	149	149	149	149
Adjusted R^2	0.1324	0.1925	0.1634	0.1738	0.1989

Standard errors in parentheses. ***,**,* indicate significance at the 1, 5, and 10 percent level.
[a]transport, mill, health facility, basic education; [b] health facility, basic education

For all indicators other than mills, council dominance by the ruling party has a highly significant positive effect on improvement in access to infrastructure.[26] For the social infrastructure indicator, for instance, the interpretation of the OLS results is the following: For the average household in a constituency located in a district with a council dominated by the ruling party, the combined distance to social infrastructure facilities would on average have been by 15km more than for a household in a constituency in a opposition dominated district (Models 3 and 4).

In contrast, having voted for the ruling party in the 2001 presidential or parliamentary elections has no significant effect on access to social infrastructure. The estimate for the council dominance dummy is essentially robust against exclusion of the president and parliament dummies (Model 4).

The combined effect for social infrastructure appears to be mainly driven by improvements in access to health facilities indicates, with an average improvement of 10.3 km excess distance reduction for MMD dominated districts (Model 5). The coefficient for health infrastructure (and its standard error) are virtually unaffected by the exclusion of the municipality and city dummies (not reported).

What is striking about these consistently positive and significant coefficients for MMD council dominance is that - as explained above - district councils themselves command only almost no own financial resources to invest in this kind of infrastructure. By far the largest share of funding for infrastructure at local level is channeled through deconcentrated offices of central government's line ministries and to a lesser extent through off-budget donor funding.

This, I argue, indicates that indeed central government targets public spending for social infrastructure to districts and constituencies that can be considered part of the ruling party's local power base. But, rather than supporting the classical hypothesis that

however would not convincingly explain the negative sign for the presidential majority dummy. Another explanation could be linked to the fact that the hammer mill variable picks up location of constituencies in rural districts: According to the 1998 LCMS report, hammermills are considered especially important in rural areas as most households take their staple food, maize, to hammermills to be ground into maize flour, while in urban areas the staple food is mostly often bought ready milled from shops (Republic of Zambia 1998: 78). Moreover, as mills are usually private sector enterprises, their provision may be determined by very different factors than those of interest in this paper. Changes in access to mills can thus probably does not represent a plausible indicator for (targeted) public spending on infrastructure.

[26] Results for models not included in Table 5 are reported in Table 8 in the Annex.

discretionary public spending is targeted at maximizing votes on general elections, the observed pattern seems to indicate that the ruling party elite in Zambia uses public spending to generate support for locally elected councillors. This could be explained by the need of the ruling elite to maintain an extended clientelistic network through its party structure.

However, there clearly is reason to suspect that the estimates of preferential targeting of public investment in Table 5 might by systematically biased: If the government is in fact committed to reduce poverty and believes that this can be done through the provision of adequate infrastructure, one would expect public spending for infrastructure investment to be predominantly targeted at poorer constituencies in the country. If at the same time, the ruling party enjoys particularly strong support among the poorer segments of society, e.g. because of some specific party characteristics[27] or - if voting is driven by ethnic or other unevenly distributed preferences - because the regional distribution of party strongholds coincides or at least overlaps with that of unevenly distributed poverty incidence - then the OLS approach in Table 5 would partly attribute the government's actual poverty targeting to my measure of clientelistic interests. A quick inspection of Tables 3 and 2 suggest that this this might indeed be the case.

3.3.2 Testing for Endogeneity

To test whether the described problem is indeed relevant in the data, I run probit regressions of election outcomes on all three levels (presidential, parliamentary, and local government) on the constituency poverty headcount in 1998 and regional dummies. The results reported in Table 6 support the suspicion that voting behavior is correlated with poverty incidence and geographic location: a higher poverty headcount increases the probability that a constituency is carried by the incumbent party, at least in presidential and local elections: the poverty headcount is significant and positive at the 5 and 10 percent level respectively.

Moreover, the results also provide strong evidence that voting occurs along regional (and

[27]Note that if the poor vote for the ruling party because of their poverty-oriented spending one basically returns to Down's argument that public spending buys votes. The (primarily semantic) difference in the argument here, however, lies in the differen objective of targeting spending at reducing poverty rather than maximizing votes.

Table 6: Voting by Regions and Poverty Incidence

	President MMD	MP MMD	Council MMD
Poverty	3.29**	1.25	2.71*
	(1.44)	(1.11)	(1.58)
Copperbelt	2.14***	1.56***	-[a]
	(.69)	(.55)	
Eastern	-1.73***	-1.66***	-[b]
	(.60)	(.59)	
Luapula	-[a]	1.36**	-[a]
		(.61)	
Lusaka	-1.01	-1.20*	-1.44**
	(.71)	(.66)	(.70)
Northern	-[a]	1.66***	-[a]
		(.58)	
North-Western	-.66	-.67	-.36
	(.52)	(.52)	(.50)
Southern	-[b]	-1.63***	-2.06***
		(.59)	(.61)
Western	-1.89***	-1.04**	-.69
	(.62)	(.50)	(.49)
Intercept	-2.63**	-.99	(-1.78)
	(1.21)	(.95)	(1.31)
Observations	96	149	74
Pseudo R2	0.4931	0.5204	0.2618

[a] predicts success perfectly, [b] predicts failure perfectly

possibly ethnic) lines.[28] This finding of course poses a serious challenge for estimating the extent of clientelistic infrastructure provision as it indicates that the OLS estimates might be driven by a major selection bias problem: Obviously, if the government is interested in reducing poverty and improving access of the poor to social infrastructure, it should direct investment in these facilities to those areas with the highest poverty incidence. However, if the poor tend to vote predominantly for the party in power then an ordinary regression approach fails to distinguish between this 'poverty-effect' and a 'patronage-effect'.

[28]The dummy variables for city and municipal districts are left out here as because of their uneven distribution across provinces and the fact that they do not affect the OLS estimates reported in Table 5 (Of 17 constituencies in city councils, 9 are located in Copperbelt province, 7 in Lusaka and only 1 in Southern province). A probit regression only on poverty headcount and type of council dummies yields no significant coefficients. Adding interaction terms of poverty headcount and regional dummies does not increase the explanatory power of the model.

To solve this dilemma I propose a propensity score matching approach to estimate the average effect of having voted for the ruling party in 2001 on the access to infrastructure at constituency level.

3.3.3 Propensity Score Matching

The main interest of this paper is on estimating the extent to which constituencies that are part of the ruling party's local power base receive preferential treatment with regard to infrastructure investment. Given the findings of the OLS regressions, I concentrate the further analysis on the effect of party dominance in local councils. In other words, I want to estimate the average treatment effect on the treated (ATT), where the 'treatment' for a constituency is defined as being located in a district with a MMD dominated council.[29]

As a first step, I estimate the ATT for the comprehensive infrastructure indicator including all types of infrastructure (Model 1 in Table 5). I calculate propensity scores using the same controls as in Models 1-5 in Table 5. Figure 1 shows the histogram of propensity scores when all controls are included. Nearest neighbor matching reduces the sample to 82 treated constituencies and 50 controls the balancing requirement is satisfied but 4 out of 9 provinces that predict success or failure perfectly are dropped as well as city and municipal constituencies).

Clearly, the distribution of treated and untreated cases against the propensity scores is less than optimal.

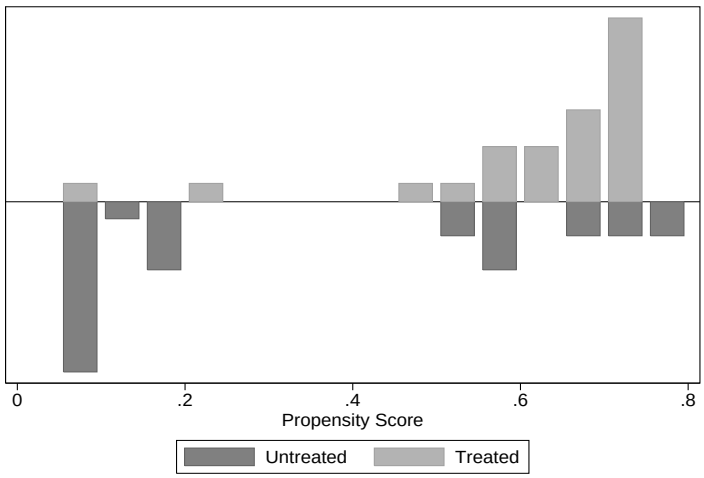
Estimating based on this matching equation does not yield a significant ATT for the indicator including all types of infrastructure in any of the specifications, indicating that the significant OLS estimate might indeed be due to the described sources of potential bias.

In a next step, I therefore estimate the ATT for the combined social infrastructure as well as for access to health facilities and primary schools only.

Using nearest neighbor matching with equal weights for equidistant neighbors, for the

[29] I ran a number of regressions with propensity score matched on the presidential and the MP dummies applying different matching algorithms and found that the results support the insignificant estimates of the OLS regressions. Most notably, however, the effect on hammermills of both, the presidential and the MP dummy variable also disappears with appropriately matched controls.

Figure 1: Propensity Scores Council Dominance - All Controls



combined indicator, yields an ATT of 9.845 with a standard error of 4.357, indicating a reduction of combined distance to health and basic education facilities attributable to being located in a MMD dominated district of almost 10 km, some 5km less than the OLS estimate. Bootstrapping yields larger standard errors in the region of 6.3 and randomly drawing from equidistant neighbors yields a lower ATT of around 8 km distance reduction and standard errors in the region of 4.8.

Using kernel matching and restricting the sample to the region of common support reduces the number of treated constituencies to 25 and that of controls to 14 and yields an ATT of 14.111 with bootstrap standard errors in the region of 7.7 to 9.4.

As the OLS estimates suggest that the effect on access to basic education infrastructure is weaker than that of health, I also estimate the ATT for primary schools only. In none of the specifications do I find the ATT to be significantly different from zero.[30]

Turning to improvement in access to health facilities and applying nearest neighbor matching with equal weights for equidistant neighbors, I find a significant ATT for health of 8.076 with a standard error of 2.793[31] (bootstrapping yields somewhat larger standard

[30] One explanation for this could be that an important share of basic education facilities seem to be provided by non-governmental organizations an local communities who could compensate for biased central government spending. Unfortunately, the LCMS only distinguishes between community schools and publicly financed primary schools from 2004 on, so this cannot be tested with the available data. In addition, there is evidence that decision making in the education sector is more decentralized than in other sectors, which would explain a reduced influence by central government on investment decisions.

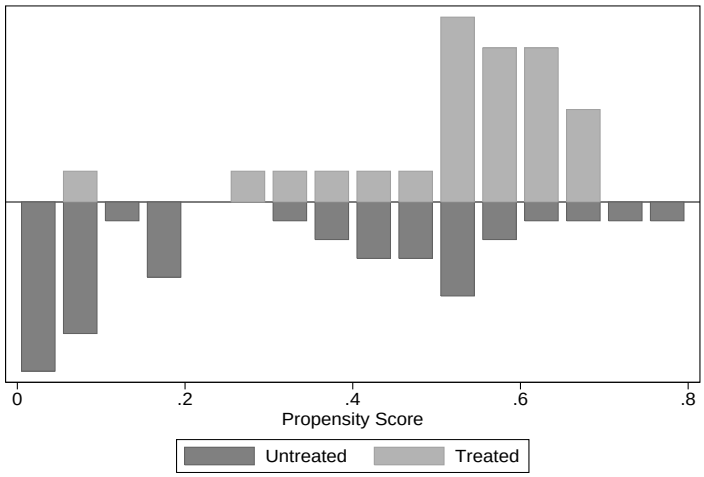
[31] (t-statistic 2.891)

errors in the region of 3.8). Randomly drawing from equidistant neighbors yields similarly significant but somewhat smaller estimates for the ATT of between roughly 6.8 and 7.5 kilometers distance reduction (bootstrap standard errors lie in the region of 4.5 and reduce the estimate for the ATT to 6.402).

Kernel matching increases the estimate for the ATT to 8.956 and bootstrap standard errors lie in the region of 5.6.

These estimates are robust against dropping the city and/or the municipality dummy from the propensity matching equation, increasing the ATT to 9.09 (standard error 5.041) without the municipal dummy in the random draw version and 9.649 (3.311) without the city dummy. Dropping both variables from the matching equation still yields an ATT estimate of 7.124 (3.092) but essentially renders the matching procedure ineffective with regard to eliminating the estimated selection bias (Figure 2 shows the propensity score histogram if the city dummy is droppd).

Figure 2: Propensity Scores Matching Equation without Municipality Dummy



Limiting the sample to rural districts prior to matching reduces the sample by fifty constituencies. Keeping all controls (i.e. province dummies and poverty headcount) in the matching equation I estimate an ATT of 7.449 (standard error 3.034) with equal weights nearest neighbors (58 treated, 24 controls). Imposing the common support restriction reduces the sample to 25 treated and merely 8 control cases and yields a insignificant

ATT of 3.173 (standard error 6.153).

Imposing the common support restriction but limiting the control variables to poverty incidence and those province dummies that show significant coefficients in the OLS regressions (Copperbelt, Northern, Western) yields a significant ATT of 6.942 (standard error 3.424) with random drawn nearest neighbor matching (36 treated, 23 controls) and 6.942 with equal weights.

Of the different specifications tested, limiting the estimation to rural and municipal councils and including those province dummies that yield significant OLS estimates seems to work best, yielding a reduction in the estimated bias caused by poverty levels by 64 percent (with 73 treated and 57 control constituencies).

Figure 3: Propensity Scores Council Dominance - Rural and Municipal Districts

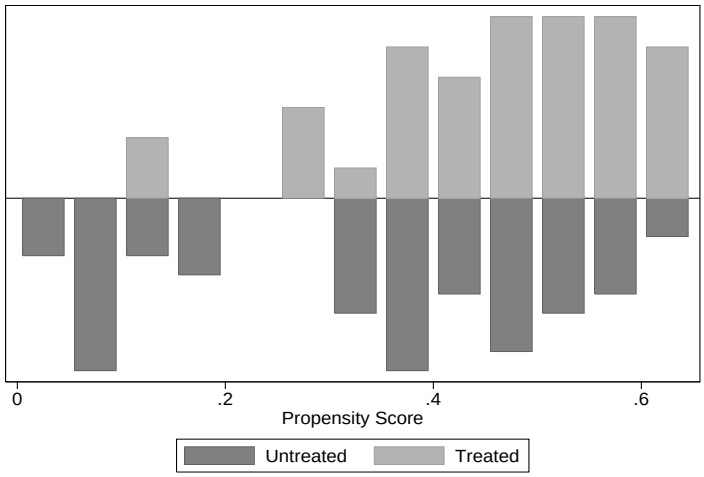


Figure 3 shows the histogramm of propensity scores, indicating the fairly effective matching. The estimated ATT for health infrastructure in this specification is 7.538 with a standard error of 2.262 for the equal weights nearest neighbor algorithm.

4 Conclusions

The main interest of this paper is to demonstrate the usability of household level data in assessing whether the central government in 'typical' neopatrimonial state such as Zambia uses public spending at local government level as a political instrument to strengthen its power base among the electorate. As a first application, this paper employs data from Zambia's Living Conditions Monitoring Surveys to test whether there is evidence that the ruling party in Zambia targets public spending as a means to maintain clientelistic networks and strengthen its local power base.

To circumvent the problem of data availability, an indirect measure of public spending is employed, namely data collected at household level on access to (mostly publicly funded) infrastructure such as schools or health facilities. This kind of data is available from Living Standards Monitoring Surveys (LSMS) conducted in a number of African countries, including Zambia. The proposed approach should thus be replicable in other countries where similar data exists and where the political and administrative structures exhibit similar features as in Zambia.

Simple OLS regressions find evidence that access to health infrastructure improved disproportionately in constituencies within districts with councils dominated by the ruling party MMD, even after controlling for poverty levels and regional disparities. Since the councils themselves command only negligible own resources, it can be argued that this observed effect could be due to 'neopatrimonial' or clientelistic spending.[32]

However, there is evidence that the ruling party's power base is particularly strong among the country's poor, which could lead to biased estimates. To control for the potential selection bias, comparable government party and opposition dominated constituencies are matched using a propensity score matching procedure. With this approach it is possible - at least partly - to control for the possible selection bias.

Even when applying this matching procedure, I find that access to health infrastructure improved disproportionally in government party dominated constituencies.

These findings could be an indication that local elites in Zambia's 'neopatrimonial' regime

[32]In principle, it would be conceivable that for some reason MMD dominated councils are more effective in raising revenue from local sources to use for the provision of health infrastructure. However, since there is evidence that the MMD tends to dominate poorer districts, this seems rather implausible.

use public resources not primarily to maximize votes in particularly contested constituencies but rather to reward their local power base for its loyalty.

Yet, to clarify this particular point one would need to examine more carefully the timing of changes in access to infrastructure in relation to elections and explicitly test the swing-voter hypothesis. With the availability of new data over the next years, this should be feasible: a new LCMS has been carried out in 2010, and in 2011 the next general elections will take place in Zambia. With this new data at hand, it should be possible to tackle the remaining questions and explicitly test the swing-voter against the core-voter model. Moreover, with additional information on constituency size and population density, the matching procedure could certainly be improved.

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A Annex

Table 7: Percentage Distribution of Households by Proximity to Facilities 1998

		Distance to facility				Total number
		0-5km	6-15km	16km+	Total	of households
Food Market	All Households	60	16	24	100	1,889,000
	Rural	38	25	37	100	1,209,000
	Urban	99	1	1	100	680,000
Post Office	All Households	43	21	37	100	1,889,000
	Rural	16	27	57	100	1,209,000
	Urban	90	9	1	100	680,000
Primary School	All Households	91	7	2	100	1,889,000
	Rural	86	11	3	100	1,209,000
	Urban	99	1	-	100	680,000
Secondary School	All Households	51	16	32	100	1,889,000
	Rural	26	24	50	100	1,209,000
	Urban	96	3	1	100	680,000
Health Facility	All Households	68	22	11	100	1,889,000
	Rural	50	34	17	100	1,209,000
	Urban	99	1	-	100	680,000
Hammermill	All Households	84	10	6	100	1,889,000
	Rural	76	15	10	100	1,209,000
	Urban	99	1	-	100	680,000
Input Market	All Households	40	21	39	100	1,889,000
	Rural	18	22	61	100	1,209,000
	Urban	79	19	2	100	680,000
Police Station	All Households	48	18	34	100	1,889,000
	Rural	19	27	54	100	1,209,000
	Urban	97	2	1	100	680,000
Bank	All Households	33	14	53	100	1,889,000
	Rural	6	13	81	100	1,209,000
	Urban	81	15	4	100	680,000
Public Transport	All Households	78	12	10	100	1,889,000
	Rural	66	18	16	100	1,209,000
	Urban	99	1	-	100	680,000

Table 8: OLS Changes in Access to Infrastructure - others

Dependent Variable	Input Market	Police	Post	Bank
President MMD	2.68	1.45	2.21	1.63
	11.39	8.67	8.48	12.24
MP MMD	-10.96	-1.72	-6.90	-0.17
	10.04	7.56	7.40	10.68
Council MMD	26.56	16.76	16.77	16.00
	8.11	6.40	6.26	9.03
Municipal	-4.25	-2.51	0.13	-4.79
	5.08	4.02	3.93	5.67
City	-7.34	0.05	-7.52	-5.95
	8.29	6.55	6.41	9.25
Poverty	17.60	-4.65	-0.48	51.57
	15.32	12.05	11.79	17.01
Copperbelt	-18.82	-15.50	-9.02	-8.24
	9.71	7.68	7.51	10.84
Eastern	-1.62	7.75	6.74	28.82
	9.28	7.33	7.17	10.35
Luapula	-3.25	4.72	0.24	-10.16
	9.55	7.56	7.39	10.67
Lusaka	13.26	-1.50	7.13	20.99
	10.71	8.47	8.29	11.96
Northern	-1.21	-5.94	-7.70	4.55
	8.73	6.91	6.76	9.75
North-Western	11.24	7.38	7.51	34.51
	9.15	7.24	7.08	10.21
Southern	5.74	3.90	5.24	12.73
	9.17	7.25	7.09	10.23
Western	14.58	10.95	13.67	13.66
	9.16	7.16	7.01	10.11
Intercept	-12.76	0.39	-6.82	-47.96
	13.98	11.04	10.80	15.58
Observations	148	149	149	149
R-Squared	0.2835	0.1894	0.1697	0.3033

Figure 4: Map of Zambia

Source: http://www.bized.co.uk/virtual/dc/resource/map_prov.htm