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Alignment and Fiscal Outcomes in
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Rewarding Allegiance: Political Alignment and Fiscal Outcomes in Local Government

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Abstract

We examine how local governments' political alignment with central government affects subnational fiscal outcomes. In theory, alignment could be rewarded with more intergovernmental transfers, or swing voters in unaligned constituencies could be targeted instead. We analyze data from Ghana, which has a complex decentralized system: District Chief Executives (DCEs) are centrally-appointed local administrators loyal to the ruling party, while district MPs may belong to another party. A formula for transfer distribution aims to limit the influence of party politics. Using a new dataset for 1994-2014 and a regression discontinuity design, we find that despite this system, districts with aligned MP and DCE receive more transfers, have higher district expenditure, and more internally generated funds. Results are strongest for a subsample of constant districts over the period, suggesting that municipal fragmentation has weakened political alignment effects. We also show strong electoral cycle effects, and find a crowd-in effect for Ghanaian districts.

JEL codes: H7, D72, H87, O55

Keywords: fiscal federalism, political alignment, flypaper effect, Ghana, regression discontinuity

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1 Introduction

Fiscal policy outcomes in decentralized systems are often influenced by political factors such as political alignment between the central and local governments, and electoral cycle pressures. Given politicians' primary aim of securing re-election, Lindbeck and Weibull (1987) proposed that intergovernmental transfers (i.e. fiscal transfers from the central to the local government level) would be targeted primarily at swing voters in order to convince them to cast their vote for the incumbent party candidate in the next election. Cox and McCubbins (1986) instead contended that transfers would aim at rewarding core supporters in constituencies that chose the incumbent party with a larger vote share. A sizeable empirical literature now exists on the political motivations behind intergovernmental transfers. The evidence generally, but not exclusively, supports the core-voter-targeting explanation for politically-motivated intergovernmental transfers.¹

The present paper provides the first comprehensive analysis of how political factors affect a range of fiscal outcomes in a complex, developing-country context. Specifically, we look at Ghana and answer three related questions: how does political alignment influence subnational fiscal outcomes, including intergovernmental transfers, and local expenditure and internally generated funds? Second, are there electoral cycle effects in local fiscal outcomes? And finally, is there a crowding-in effect (often called a flypaper effect), i.e. do intergovernmental transfers lead to disproportionate increases in local expenditure compared to similar-sized internally generated revenues?

Ghana is a stable multi-party democracy with regular elections that are deemed free and fair. It has seen six national-level elections and three peaceful changes in power between ruling parties since the return to democracy in 1992. The country has a decentralized system of government, with substantial powers delegated to the Metropolitan, Municipal and District Assemblies – what we call District Assemblies (DAs) for simplicity (see section 3 for more details). Crucially, Ghana's system adds a layer of complexity to the conventional political alignment setup, where one key local figure (e.g. a mayor of a municipality or a state governor) is either aligned or unaligned with the central government. Ghana's DA membership is made up of both locally-elected and centrally-

¹The empirical evidence spans countries across the world, from the United States (Larcinese et al. 2006), to India (Rodden and Wilkinson 2004), Brazil (Brollo and Nannicini 2012), and Italy (Bracco et al. 2015), to name a few recent contributions.

appointed officials, in addition to the Member(s) of Parliament (MP) representing the local constituency.² The most powerful political appointee is the District Chief Executive (DCE), the head of the DA directly appointed by the President. DCEs are viewed as party cronies and owe their allegiance to the central government, whose policies they are expected to promote and for whom they should garner support among the district electorate (Ahwoi 2010; Ayee and Dickovick 2010; Mohammed 2015). This means that in principle, *all* districts are aligned with the central government to the same degree. Nevertheless, political differences can and do arise from the fact that MPs instead may be of an opposition party, and that DCEs and MPs are often at odds with each other.³ Political alignment of a district in the Ghanaian system is therefore determined in practice by the political affiliation of the local MP(s).

All districts are heavily reliant on central government transfers to carry out their duties, and both the DCE – as the head of the DA – and the MP(s) are viewed by the general public as responsible for district-level policies. In a context where showing that one can ‘get things done’ is very important, MPs however have limited (public) financial means at their disposal to directly target their constituency, giving DCEs the upper hand when it comes to exploiting the possibilities of politically-motivated transfers. The Ghanaian system seeks to prevent such patronage by making the allocation of the main central transfer – the District Assembly Common Fund (DACF) – subject to a mathematical formula, approved annually by Parliament, that considers a district’s population size and comparative development factors.⁴ Yet, Banful (2011) finds evidence of political motivation in the relative size of transfers of DACF moneys, and of the weights given to the criteria in the formula: transfers tend to be targeted at swing districts, and the formula appears to be amended with this aim prior to national elections.

This paper looks beyond just the DACF and uses a unique, broad set of measures of district-level fiscal outcomes for the years 1994-2014, covering five national-level elections.

²Each district has at least one constituency. The more populous Municipal and Metropolitan districts have more than one constituency and MP.

³Ghana has a multi-party system, but politics are dominated by the two largest parties, the New Patriotic Party (NPP) and the National Democratic Congress (NDC). All Presidents so far have been members of either of these two parties. The two parties are generally characterized as center-right and center-left, respectively, with only loose ethnic group identifications (see e.g. Boylan 2016).

⁴There is an ongoing debate on whether the small share of the DACF transfers devoted to MPs’ district development projects is unconstitutional. There are numerous calls for revising the current policy and having MPs focus on their core job of legislating at the national level, though it is recognized that this will necessitate a change in people’s perceptions of MPs’ responsibilities and the extent of their power (see Ahwoi 2010).

We apply a careful causal identification approach to analyze whether Ghana’s complex system shows any evidence of political influences, despite the built-in hurdles to party favouritism in intergovernmental transfers. The peculiar political pressures and rivalries at the local constituency level would lead us to expect that, if anything, there is targeting of swing voters through increased transfers to (marginally) non-aligned districts. We first examine variations in district fiscal outcomes over the entire electoral cycle and show that there is a marked increase on average across districts and fiscal measures in (pre-) election years, but no clear evidence for political alignment effects.

We then apply a regression discontinuity design (RDD) – which has been frequently employed in the recent empirical literature on political alignment effects – and instead find clear evidence of political targeting of core supporters, particularly in intergovernmental transfers and district expenditure, and to a lesser degree also in internally generated funds (IGF). Our treatment variable is an alignment dummy that takes the value of one if the district is aligned with the central government, and 0 otherwise. Our assignment variable is the difference between the percentage of vote share of the parliamentary candidate of the party that wins the national elections, and the percentage of vote share of the parliamentary candidate of the main opposition party that loses the national elections.⁵ Hence, a positive margin denotes an aligned, while a negative margin implies an unaligned district. Results from an extension using time-differences-in-differences point in the same direction. A plausible explanation is that it is difficult to successfully identify and target ‘swing’ voters and districts in a context where district-level voting patterns in national elections seldom persist for more than two electoral cycles. In addition, the flip-side of core supporter reward implies that DCEs who fail to bring their district close to the governing party line might be ‘punished’ with relatively lower transfers.⁶

Finally, we demonstrate that transfers crowd-in both local government expenditure and own revenues, using the instrumental variables (IV) approach proposed by Bracco et al. (2015), with our alignment dummy as the exogenous instrument for transfers.

Our main sample includes a balanced panel of the 39 districts that have been present throughout the period under analysis (what we term “constant” districts). There has been a remarkable process of municipal fragmentation in Ghana since the current Constitution

⁵We use the vote shares of NPP and NDC in determining vote margin. We assign winner or loser according to which of these two parties win the national presidential elections.

⁶Robinson and Torvik (2009) focus on the possibility that swing voters are severely punished, potentially to the point of disenfranchisement. There is no evidence of the use of such ‘sticks’ in Ghana.

was passed in 1992, which has led to a stepwise increase in the number of districts from 110 in 1994, to 216 at the end of our sample period. Our results are broadly consistent when we vary the sample size, including all districts in the sample, or districts with only one MP, where political alignment is most clear-cut. However, results are strongest for our main sample, suggesting that municipal fragmentation in Ghana has in effect weakened any attempts at political targeting of transfers to date, in spite of recent criticism of gerrymandering in the setting of new district boundaries (see Riedl and Dickovick 2014; Mohammed 2015). Our results suggest that it is in fact this continued fragmentation, rather than the complex political system, that has played the biggest role in curtailing the influence of political favouritism in subnational fiscal outcomes in Ghana.

The rest of the paper is structured as follows: Section 2 provides a brief literature review; Section 3 gives more details on the Ghanaian context; Section 4 presents the methodology and data; Section 5 discusses the political alignment results and Section 6 the flypaper effect results; and Section 7 draws conclusions.

2 Literature review

The modern debate on the decentralization of government goes back to Buchanan (1950), Musgrave (1959), and Oates (1972, 1977), who argued that decentralization leads to greater political participation, accountability, and administrative and fiscal efficiency. Critics of decentralization instead point out that it leads to soft budget constraints, macroeconomic instability, clientelism, and greater government size (e.g. Rodden 2006).

A vast literature has since developed on the merits and demerits of a decentralized system. One aspect that has received particular attention is the importance of intergovernmental transfers for the provision of public goods and for political competition at the local level. In theory, these transfers could be used to increase politicians' re-election chances, either by convincing swing voters (e.g. Lindbeck and Weibull 1987), or by rewarding core supporters (e.g. Cox and McCubbins 1986; and Dixit and Londregan 1996). *Political alignment* – i.e. whether the local politician is of the same party or coalition as the central government – is a central concept in this strand of the literature.

Our study contributes to the large body of evidence that seeks to estimate the impact of political alignment on central transfers. Empirically, most studies have found a positive

effect of political alignment with the center on the size of intergovernmental transfers – especially discretionary grants – in line with the hypothesis of rewarding core supporters. Examples include Levitt and Snyder (1995) and Larcinese et al. (2006) for the U.S.; Arulampalam et al. (2009) and Rodden and Wilkinson (2004) for India; Brollo and Nannicini (2012) for Brazil; and Bracco et al. (2015) for Italy.⁷ There is also evidence of electoral cycle effects in fiscal outcomes, with an increase in the expenditure and the budget deficit in election years which can differ across countries (.e.g, Shi and Svensson 2006), or which may be driven by party politics (e.g., Sakurai and Menezes-Filho 2011). The present paper examines a decentralized system in Africa over a period of twenty years and five election cycles, and finds evidence of electoral cycle effects, and of core-supporter reward not only in the size of central government transfers, but also in district expenditures and internally generated funds, which have not received much attention so far.

Another common finding in the decentralization literature is that of a crowding-in or so-called flypaper effect: central government transfers increase the level of local government spending more than an equivalent amount of extra locally-generated revenues.⁸ We follow the strategy in Bracco et al. (2015), who isolated this effect in Italy by instrumenting central government grants with political alignment, and we find some evidence for a crowding-in effect in Ghana.

Although few contributions examine the effects of decentralization in Africa, we are not the first to do so. Mbate (2017) reviews the literature that shows how decentralization has spread throughout the continent and how it has affected governance.⁹ Appiah-Agyekum et al. (2013) present a qualitative analysis of how the Ghanaian decentralized political system influences the use of local government finance. More closely related to our paper, Miguel and Zaidi (2003) find evidence of ‘patronage targeting’ at the district level in Ghana’s education spending between 1996 and 2000, applying a regression discontinuity design to a random sample of schools. Mogues and Benin (2012) use a panel dataset for Ghana from 1994-2004 and show that central government transfers crowd out locally-generated revenues, in spite of incentives for raising own funds that are built

⁷In a related paper, Borcan (2020) looks at the links between political alignment and electoral fraud in Romania.

⁸See Inman (2008) for a review of the literature on the flypaper effect.

⁹Riedl and Dickovick (2014) instead look at how political party systems have affected decentralization in Africa, and include Ghana in their case studies.

into the criteria for allocation of the DACF. Banful (2011) extends the same dataset to 1994-2005 to examine whether the formula for the allocation of DACF moneys eliminates politically-motivated targeting of transfers. In fixed-effect estimations, she finds that transfers follow the swing-voter hypothesis: districts with lower vote margins in the previous election receive relatively more transfers, and the criteria for funding allocation change in line with this prediction. Using a longer time period of official data than all previous contributions and applying an RD design, we instead find evidence for the core-supporter hypothesis in Ghana.

3 The local governance structure of Ghana

3.1 The institutional framework

Our focus is on Ghana, so it is worth describing the country's decentralized political and fiscal system in some detail before turning to the empirical analysis. Ghana has been a stable, multi-party presidential democracy since the new Constitution of 1992 signalled the end of the last military government. The new Constitution included a decentralized structure of government, with substantial powers delegated to sub-national entities; fiscal decentralization was added in 1994 to formalize central government transfers to local authorities.¹⁰ In practice, the current decentralized governance system has four tiers below the center, operating – starting at the top of the hierarchy – at the regional, district, zonal, and Unit Committee levels. In this article, we concentrate on the District Assemblies (DAs), which act as the crucial links between regional and central governments above, and Zonal Councils, Unit Committees and the general population below.¹¹

The Constitution of Ghana specifies that the DAs are the highest political, legislating, budgeting, and planning authorities at the local level.¹² In order to carry out its plans, a

¹⁰Decentralization was further strengthened in 2010 under the Decentralization Policy Framework.

¹¹The Regional Coordinating Councils (RCCs) have little real power beyond coordinating activities and strategies, while the two lowest levels are mainly responsible for carrying out at the local level the policies decided above, and for conveying concerns from the population to the higher government levels.

¹²Among their most important tasks are the preparation of annual district Development Plans, which should be subjected to public hearings to ensure alignment with local needs; and of annual budget estimates. Both require approval by a majority of District Assembly members. Development is prescribed to be pro-poor and cover basic infrastructure, the provision of municipal works and services, the management of human settlements and of the natural environment in the district (FES 2016). In particular, DAs are responsible for fire protection; the civil status register; the maintenance of a statistical office; education services including pre-school, primary, and junior secondary education; social welfare services

District authority has three sources of revenue: central grants directed to the District Assemblies Common Fund (DACF); ceded revenue;¹³ and internally generated funds (IGF) raised through local taxation, fees, fines, and charges. The DACF and ceded revenue are both central government transfers, but the DACF constitutes the main source of funding of district authorities. It has a constitutionally stipulated minimum share of central government revenue of at least 5%; it is distributed between DAs according to a formula approved annually by Parliament, and in turn its allocation by DAs must be approved by the central government.¹⁴

The DACF allocation formula is calculated as a weighted linear combination of four criteria, which adds up to 100%. The most important is the ‘Equality’ criterion, which ensures that each district benefits from a substantial amount of the DACF by providing an equal base sum to every district. The ‘Need’ criterion is targeted at bridging the gap between rich and poor districts. It considers factors such as income or wealth, population, health facilities, doctor-to-population and nurse-to-population ratios, education facilities, pupils-to-teacher ratio, water coverage, tarred roads mileage, and number of dilapidated schools. The ‘Responsiveness’ criterion serves as an incentive for districts to raise their own revenues, although the indicators used to measure own revenue generation have greatly varied over the years (Banful 2011). Finally, a measure of the intensity of use of public facilities in a district - ‘Service Pressure’ – is included in the formula to account for the implications of population density for public facilities. We control for district population and the number of private schools in our regression estimations to take some of the main DACF allocation criteria into account. Note that the weight assigned to these criteria frequently varies, although the ‘Equality’ criterion has always maintained the largest weight. Banful (2011) argues that formula changes are politically motivated; on the flipside, the frequent changes in the DACF formula imply that districts cannot easily influence future grant allocations, especially since allocation formula details are

including family welfare services and welfare homes; public health services including primary care and health protection; water and sanitation; refuse collection and disposal; self-help projects; cemeteries and crematoria; slaughterhouses; and parks and open spaces, sports and leisure facilities.

¹³Ceded revenue is redistributed to DAs by the Internal Revenue Service via the Ministry of Local Government and Rural Development. It includes some specialized funding sources (e.g. natural resource royalties).

¹⁴Since 1997, a small share of each district’s DACF funds – around 4-5% – is allocated to the DA’s MP(s). See the “Guidelines for Utilisation of 50% of the District Assemblies’ Common Fund Contingency Factor Allocation to be Shared on Constituency Basis”, Ministry of Local Government and Rural Development Ref. No. SCR/ADM.250/VOL.3, 18th November 1997.

only communicated with a two-year delay (see also Mogues and Benin 2012).

Although DAs can set local tax rates, the potential for fiscal revenue from local taxation is limited, as the most lucrative sources of taxation – income tax, sales tax, and import and export duties – go to the central Internal Revenue Service. Moreover, local tax collection is ineffective (Dickovick and Riedl 2010).¹⁵ Instead, district authorities overwhelmingly rely on central government transfers for their revenue, with grants and DACF funds combined making up on average over 80% of DAs’ revenue sources. Figure 1 clearly confirms the huge reliance of districts on central government transfers.

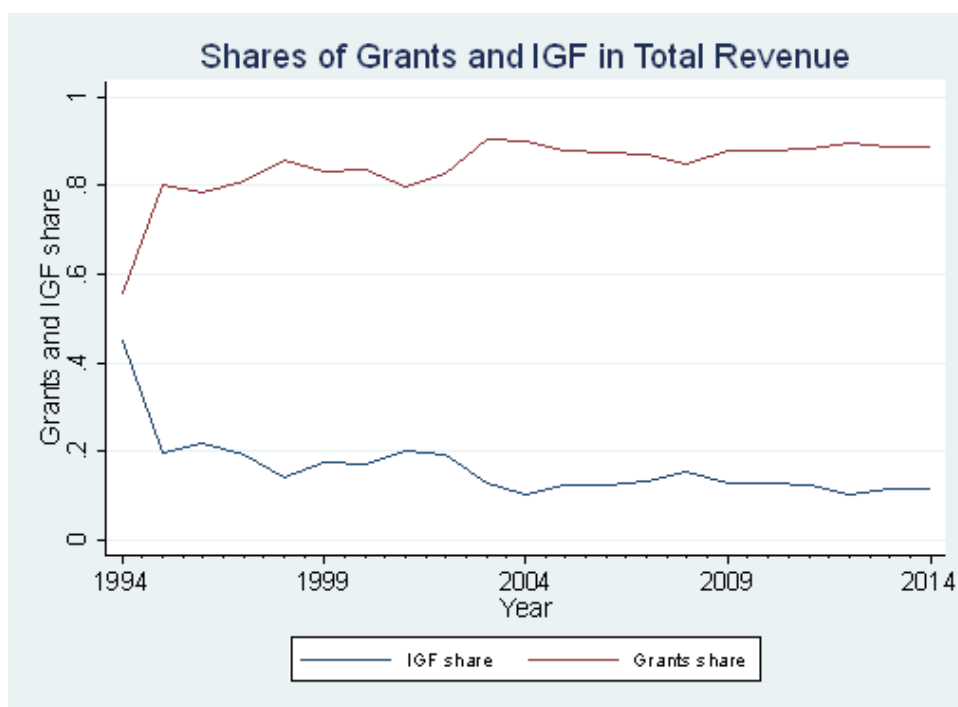


Figure 1: Mean shares of grants and IGF in districts’ total revenue in Ghana, 1994-2014

Since the Constitution of 1992, Ghana has gone through four rounds of district government fragmentation, which have successively increased the number of districts from 110 to 138 (after the creation of new districts in 2004), to 173 (2008), 216 (2012), to currently 254 (2018). In the early phases, fragmentation gave due consideration to the idea of economic viability of the new districts and the creation of effective local institutions; however, critics argue that since the 2000’s, fragmentation has actually worsened central

¹⁵There is one other potential source of revenue, which however has uneven usage across districts and time: revenue may come from outside the national framework, for example from the IMF/ World Bank’s Heavily Indebted Poor Countries (HIPC) Initiative debt relief programme (FES 2016). Note that District Assemblies are not allowed to set deficit budgets, and any loans require prior approval by the Ministry of Finance. The Auditor General audits the annual accounts of DAs and presents a report to parliament.

public spending inefficiencies and weakened local fiscal accountability (e.g., Mohammed 2015).¹⁶ In order to avoid bias driven by politically-motivated district boundaries as much as possible, our main results rely on a restricted sample of 39 districts that remain unaltered in our sample from 1994-2014.¹⁷

The DAs' huge reliance on central government moneys to carry out their duties potentially opens up avenues for politically motivated transfers. To better assess this possibility, we next describe Ghana's local government politics in more detail.

3.2 Local government politics

A unique feature of local governance in Ghana is that membership of the District Assemblies is determined through a combination of centrally-made appointments and locally elected representatives. 70% of Assembly Members are elected; these elected members are also members of the Unit Committee in their local electoral area. The DA further includes the member(s) of parliament (MPs) representing the constituency(-ies) within the district; MPs are *ex officio* members with no voting right in general assembly meetings of DAs. Elections for DA members – but not MPs – are on a non-partisan basis; the elections are state-sponsored and conducted by the electoral commission. Finally, 30% of the DA members are directly appointed by the president, (theoretically) in consultation with chiefs and interest groups in the district.

Crucially, the appointed members include the District Chief Executive (DCE), who is the political-administrative head of the DA with the power to initiate, design and implement policies, and tasked with managing the district's resources (FES 2016; Debrah 2016). The approval of the government's DCE nominee depends on a two-thirds majority of the vote in the general DA. Those in favor of the system argue that it is necessary for the President to be given the opportunity to mobilize so-called competent and experienced individuals to complement elected assembly members, who may not always have

¹⁶The motives behind the creation of new districts have also come under scrutiny, as the increase in constituencies and MPs that accompanies fragmentation has raised accusations of 'gerrymandering', i.e. the manipulation of constituency boundaries to favor one party (Riedl and Dickovick 2014; Mohammed 2015). While this strategy works sometimes in Ghana, our data show that newly created districts are no more loyal to one party over time than districts that have existed since 1992. Few districts in Ghana can truly be regarded as 'safe' for any political party for more than two electoral cycles.

¹⁷We cannot exclude that the reasons why these districts remain 'constant' introduce their own bias into our estimations. They are mainly rural districts with no large urban center. However, in robustness tests using different sample variations (discussed below), we find similar results.

technical knowledge of the issues (Debrah 2016). However, appointees tend to be seen as party cronies rather than technicians (Afrobarometer 2008; Ayee and Dickovick 2010; Mohammed 2015). In fact, DCEs are subject to “centripetal forces of central control” that pull their districts towards the central government (Ahwoi 2010: 7), and they are highly aware of being accountable to the President, who can “sack [them] at any time” (Ahwoi 2010: 15). The outcome of this mixed model of political appointees (heavily linked to the central government) and elected members (who may be aligned with the opposition) is ‘administrative politicking’: DCEs are often accused of breaking administrative rules, interfering with MPs’ local political roles, distrusting civil servants, and generally contributing to chaotic local government (Debrah 2016).

DCEs and MPs frequently clash due to a peculiarity in the system mentioned above: MPs receive a share of a district’s DACF for own projects and ‘monitoring’, and the allocation and disbursement of this share must be approved by the DCE.¹⁸ Tensions between the two sides also arise from extreme partisanship and the desire to score political points; from personality conflicts; and from low transparency and trust – all of which are likely exacerbated by the appointee’s often being the unsuccessful candidate in the last parliamentary race, especially in districts won by the opposition.¹⁹ In fact, though influential, the DCE’s position is precarious because it depends on presidential favor, and it is subject to a two-term limit. If the DCE has ambitions for a more secure and prominent political career, they will typically run for MP (Ahwoi 2010). Competition is always likely to be high in districts where there is differing party allegiance between DCE and MP(s), but if DCEs show an interest in the parliamentary seat, tensions arise even when both sides are in the same party (Boylan 2016; Debrah 2016).

In sum, no matter the outcome of the district-level parliamentary and presidential elections, the local DCE is always likely to owe allegiance to the party in power in the central government, and may have their own political career at heart during their agenda-setting and decision-making process. A district MP, on the other hand, may be aligned

¹⁸There are numerous reports of delays in approval and disbursement, or even appropriation by the DCE to undertake projects without the knowledge of the MP (see Boylan 2016; Debrah 2016). The Minister of Local Government and Rural Development and DACF Administrator are regularly called upon to intervene in cases of conflicts over disbursements of MPs’ shares. In cases of “actual sabotage”, the DACF Administrator can directly disburse the small part of an MP’s DACF share that is allocated to ‘monitoring and evaluation’. This advance is then deducted from the next quarterly DACF tranche (personal interview with a former DACF Administrator, Accra, May 2019).

¹⁹On the tensions and clashes within DAs, see Ayee (1999); Daddieh and Bob-Milliar (2012); Boylan (2016); Debrah (2016).

or unaligned with the ruling party. The decentralized system in Ghana therefore offers an interesting case study of politically motivated intergovernmental transfers and local government expenditure patterns.

4 Data and Methodology

4.1 Effects of political alignment on fiscal outcomes

4.1.1 Electoral cycles

We first examine the effects of political alignment on fiscal outcomes in Ghana. We focus on central government grants as the main fiscal outcome, but also discuss results for district expenditure and internally generated funds (IGFs) in the extensions and robustness analysis below. To begin with, we look at systematic variation over time in local fiscal outcomes and explore the existence of electoral cycles using a panel fixed-effects estimator as follows:

$$\ln Grants_{it} = \alpha + \sigma EY_{it} + \beta X_{it} + \mu_i + \epsilon_{it}, \quad (1)$$

where $\ln Grants_{it}$ refers to the natural logarithm of real per capita central government grants to district i in year t ; EY refers to the election year dummy; and X_{it} represents a vector of control variables, including the total number of private schools in the DA – a proxy for district income – and the total population in the DA, which are given in natural logarithms. The district fixed effects and the error terms are shown as μ_i and ϵ_{it} , respectively.

In an extension, we introduce dummy variables for one and two years before the election year, with the latter dummy variable coinciding with the second year after the previous election in the four-year term. We also include an interaction term between the election year and a dummy for political alignment between DAs and central governments (described below), to determine whether the effect of elections differs between aligned and unaligned districts. We expect σ to be positive for the election year and a year before the election year, but negative for two years before the election year, signalling an electoral

cycle effect.

4.1.2 Regression Discontinuity Design (RDD)

We next examine the average causal effect of political alignment on central government grant allocations to local governments. We measure district alignment by considering the political alignment between local government political agents and the center, with the DCE and MP as our local political agents. Given that DCEs are appointed by the central government, if the elected MP in the district and the central government belong to the same party, then the DCE and MP are automatically aligned with the central government. Hence, alignment is a dummy variable equal to 1 if the DCE and MP are from the same party as the central government, and 0 otherwise. We consider parliamentary election results, because parliamentary and presidential election results in Ghana are to a large extent identical. With the unit of observation for election results at the constituency level, we aggregate the parliamentary election results to the district level as constituencies are units within districts ²⁰. Ghana has a first-past-the-post electoral system, so a party is considered to have won a district if it captures a relative majority of the parliamentary vote share. For districts with more than one MP, alignment is determined using the difference between the average of the sum of votes for the parliamentary candidates of the winner of the national election and the average of the sum of votes of the parliamentary candidates of the loser of the national elections ²¹.

We adopt the *continuity-based* Regression Discontinuity design as our identification strategy to determine the causal effect of political alignment on central government grants to local governments in Ghana. Our estimation is based on testable continuity assumptions (Cattaneo et al. 2018). We estimate the Average Treatment Effect (ATE) of political alignment based on the discontinuity in observed outcomes at the cut-off. Stated differently, the continuity approach assumes that in the absence of treatment, potential

²⁰Banful (2011) adopts a similar approach to aggregating constituency-level election results to district-level results. She also notes that presidential and parliamentary results in Ghana are virtually the same, as candidates of the two major parties win in both the presidential and parliamentary elections held in any given district.

²¹Since Ghana is effectively a two-party state, assume two parties in an election, Party A and Party B. Assume further that there are 3 constituencies in district i at time t . Both parties field candidates for each constituency. Hence, we aggregate the percentage of votes obtained by all candidates of Party A and divide by 3 and do same for Party B. If Party A's presidential candidate wins the national elections, then we assign Party A as the winner and Party B as the loser, and construct *Margin* and *Align* as described later.

outcomes are changing smoothly across the threshold; treatment alone then produces a discontinuity. An RD design is particularly suitable in our case given that local governments in Ghana are relatively homogeneous in nature, having a similar administrative, budgetary, fiscal, political, and institutional structure. The estimated model is stated as follows:

$$\ln Grants_{it} = \rho_0 Align_{it} + f(Align_{it} * Margin_{it}) + \beta_i X_{it} + \varsigma_t + \mu_i + \epsilon_{it} \quad (2)$$

where $\ln Grants_{it}$ refers to the natural logarithm of real per capita central government grants to district i in year t . Our treatment and assignment variables are $Align_{it}$ and $Margin_{it}$, respectively. Our control function, $Align_{it} * Margin_{it}$, is a p th-order polynomial in $Margin_{it}$ interacted with our treatment variable $Align_{it}$. X_{it} represents a vector of time variant control variables (i.e. total population and number of private schools) which are given in natural logarithm, ς_t refers to the year dummy, μ_i represents the district fixed effect, and the error term is given as ϵ_{it} . Our coefficient of interest is ρ_0 which measures our alignment effect at the zero threshold; a positive coefficient would indicate core-supporter targeting. We assume triangular kernel weights with bandwidth selected using the Mean Square Error (MSE)-optimal bandwidth choice. Standard errors are clustered at the district level (see Cattaneo et al. 2018).

4.2 Crowd-in or crowd-out: The effect of transfers

In a second step, we examine the effect of transfers on local government expenditures and own revenues (IGFs), following the approach of Knight (2002) and Bracco et al. (2015). The expectation for local expenditure is that there is a flypaper effect when a dollar of central government grants is associated with relatively higher levels of public spending compared with an equivalent dollar of citizen income (Inman 2008). What about IGFs or own-tax revenues? The basic median-voter model argues that central government grants will be associated with lower local taxes, since local governments will now be able to optimally mix revenue sources to fund spending. In effect, it is expected that central government grant receipts will crowd-out local government own-tax revenue generation, resulting in reduced local tax revenues (Scott 1952; Bradford and Oates 1971 a,b; and

Dahlberg et al. 2008).

Arguments on crowd-out and crowd-in effects of grants on local government spending and local government internally generated funds assume an exogenous distribution of grants (Knight, 2002). However, grant allocations are determined through a political process and are the outcome of a bargaining game at the central government level. Grant allocations are therefore likely to reflect underlying constituent preferences expressed through their elected representatives (Besley and Case 2000). Hence, ignoring the link between preferences and grant receipts may reduce any possibility of finding evidence for a crowd-in or crowd-out effect of grants on spending or local government own-revenues (Knight 2002). For instance, local government spending could increase simply because of a political decision to increase grant allocations to a local government. This makes it difficult to solely attribute any evidence of a crowd-in effect to increased grants without considering the political decision to increase such grants. Knight (2002) suggests such endogeneity could be corrected by using measures based on the political power obtained from having a legislative or parliamentary representation such as partisan affiliation (political alignment in our case), committee representation and tenure. Therefore, we follow Knight (2002) and Bracco et al. (2015) and examine the effect of central government grants by instrumenting central government grants in the following specification:

$$Y_{it} = \alpha_1 Grants_{it} + \beta_i X_{it} + \vartheta_t + \mu_i + \epsilon_{it} \quad (3)$$

where Y_{it} is a vector measuring the natural logarithm of real per capita local government expenditure and internally generated funds (i.e. own-tax revenue). We use similar control variables X_{it} as in equation (1), which are given in natural logarithms. $Grants_{it}$ represents the natural logarithm of real per capita central government transfers to local government. We instrument grants by (i) the alignment dummy only, and (ii) the alignment dummy and the fourth order polynomial function in the alignment-margin interaction term, given that grants are endogenous and grants and alignment are correlated ²². The a priori expectation is that $\alpha > 0$ for local government expenditure shows evidence of a crowd-in or flypaper effect, and $\alpha < 0$ for local government own-tax-revenue shows evidence of a crowd-out effect. The estimations include district fixed effects and

²²See Knight (2002) and Bracco et al. (2015) for theoretical proofs.

robust standard errors clustered at the district level.

4.3 Data description

We make use of data for up to 216 districts in Ghana over the period 1994-2014 covering five elections in our full sample. Since the number of districts varies over the period of the study due to district fragmentation, our main results refer to the 39 districts that remained throughout our sample period (*constant districts*). As robustness checks, we consider the (unbalanced) full sample of districts and districts with only one MP, where alignment is easiest to assign.

Our dependent variable(s) in each case remain as described earlier. Data on all our dependent variables is sourced from the various issues of the districts' budget. Data for the period 1994-2004 is from Mogues and Benin (2012), data for 2005-2010 is from the Ministry of Local Government and Rural Development (MLGRD) in Ghana, and 2011-2014 is compiled by the authors from the various issues of the individual district assemblies' composite budget for the years 2011-2015 by the Ministry of Finance and Economic Planning, Ghana.

As noted earlier, our treatment and assignment variables are the alignment dummy $Align_{it}$ and $Margin_{it}$, respectively.

Our control variables are the total population of the residents in the district and the total number of private schools in the district. Total population is constructed from the census data and population projections for the districts by the Ghana Statistical Service (GSS). We use the total number of private schools as a measure of district-level income/wealth, due to the lack of consistent local income data.²³ Data on total number of private schools in the district is sourced from the various rounds of the Ghana Annual Schools Census (Basic Schools Information) by the Ministry of Education (MOE), Ghana.

We present our descriptive statistics in Table 1. From the table, districts have relatively higher levels of expenditure than revenue, suggesting they are likely to incur budget deficits on average. The mean central government grant received by the districts is relatively higher than the mean internally generated funds of the districts. The latter is confirmed by the descriptive statistics of central government grant as share of total

²³Banful (2011) uses the total number of schools in the district (both private and public) as a proxy for district income/wealth. We argue that the total number of private schools is a better measure of district wealth, as they are closely linked to local demand and hence local wealth.

revenue and IGF as share to total revenue (Grant_share and IGF_share respectively). In particular, central government grants constitute 83.78% of local government total revenues on average, while local government IGFs make up approximately 16.60% of local government total revenues. The bigger share of central government grants to local government total revenue suggests local governments in Ghana have low levels of fiscal autonomy, and are largely dependent on central governments (see also Figure 1).

Table 1: Descriptive statistics: Full sample

Variable	Obs	Mean	Std. Dev.	Min	Max
Expenditure	2296	35558.04	79807.03	0.5254759	2078311
Revenue	2727	29799.09	61383.56	0.2290661	773438.4
Grants	2714	25320.48	55758.13	0	765464.8
IGF	2727	4574.653	10354.1	0.0540525	190906.7
Grants_share	747	83.780	13.746	4.783	100
IGF_share	751	16.596	14.967	0.594	100
Margin	695	4.848	32.001	-86.1	90.26
Align	2943	0.894	0.307	0	1
Unalign	2943	0.091	0.287	0	1
Number of MPs	2929	1.473	1.642	1	13
Private schools	1665	97.040	166.556	0	1571
Population	2929	146375.5	186606.9	21346	1900000

Note: Descriptive statistics for all variables using the full sample of districts.

5 Results on the effects of political alignment on fiscal outcomes

5.1 Electoral cycles

The results for the electoral cycle effect of central government grant allocations to DAs are given in Table 2. Columns 1-3 of Table 2 show results for the constant districts; columns 4-6 results for the full sample of districts; and columns 7-9 the results for the one-MP districts.

The coefficient of the election year dummy (EY) is positive in all cases and statistically significant for the constant DAs and for the full sample of DAs. The estimated coefficients are however larger for the constant districts. Central government grants to local governments in Ghana therefore increase in election years. Moreover, central government grant allocations to DAs increase in the year immediately preceding the election year (see

Table 2: Electoral cycle effect of central government grants

VARIABLES	Constant districts			Full Sample			One MP districts		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Baseline	Cycle	Mediate	Baseline	Cycle	Mediate	Baseline	Cycle	Mediate
<i>EY</i>	1.993*** (0.227)	2.226*** (0.299)	2.958*** (0.680)	1.484*** (0.149)	1.579*** (0.178)	1.988*** (0.348)	0.667 (0.637)	1.115 (0.693)	0.777 (0.946)
<i>Population</i>	1.043 (2.374)	0.994 (2.365)	1.048 (2.376)	2.374* (1.281)	2.355* (1.279)	2.379* (1.282)	1.205 (1.042)	1.318 (1.062)	1.206 (1.046)
<i>Private</i>	-4.897*** (0.528)	-5.010*** (0.553)	-4.893*** (0.536)	-2.420*** (0.334)	-2.485*** (0.345)	-2.430*** (0.331)	-3.192*** (0.726)	-3.505*** (0.721)	-3.182*** (0.759)
<i>EY_1</i>		0.732*** (0.227)			0.362*** (0.131)			0.970*** (0.277)	
<i>EY_2</i>		-0.158 (0.211)			-0.147 (0.104)			0.0755 (0.263)	
<i>EY * Align</i>			-1.528 (1.029)			-0.849 (0.521)			-0.246 (1.452)
Observations	414	414	414	1,479	1,479	1,479	202	202	202
R-squared	0.297	0.304	0.305	0.146	0.150	0.150	0.218	0.248	0.219

Note: Fixed effect estimations. All regressions include a constant term. Robust standard errors are in parenthesis. The dependent variable is measured in real per capita terms. ***, **, * represent statistical significance at 1, 5 and 10 per cent levels, respectively.

the coefficient of EY_1), as well as in the election year. As the coefficient magnitudes of EY and EY_1 suggest, the effect is bigger in the election year itself than the year before (note that parliamentary and presidential elections in Ghana are held in November or December). Hence, it may be said that the predilection of central governments of all political ideologies to increase grant allocations to DAs is enhanced in election years relative to non-election years. Instead, results show that there is a slight dip in grant allocations two years prior to elections (EY_2), though the effect is not significant. In sum, grant allocations to DAs by central governments follow an electoral or a political business cycle: (i) grant allocations are lower in the mid-term of the government’s four-year mandate; (ii) grant allocations increase in the year preceding the next national election year; and (iii) grant allocations are highest in election years.

The large coefficients suggest that grant allocations are delayed until election years, with DAs receiving almost three times as much in that year as they receive in other years. This is plausible in a developing country context, and echoes the results of Shi and Svensson (2006) for a large sample of countries, and of Sakurai and Menezes-Filho (2011) for Brazil.

Finally, in columns 3, 6 and 9 we examine whether the election year effect on grants differs between aligned and unaligned DAs, by introducing an interaction term between election year and political alignment ($EY * Align$). The coefficient of $EY * Align$ is consistently negative but statistically insignificant for central government grants, which suggests that political alignment does not play a salient role in central government grant allocations during the electoral cycle. However, we cannot rule out more systematic differences in fiscal outcomes between aligned and unaligned districts. To examine this issue in more detail, we next turn to the RDD approach.

5.2 Regression Discontinuity Design (RDD)

5.2.1 Design validity

We first show evidence on the design validity of our RDD approach, and then discuss the estimation results. Our design validity is in two forms; (a) a graphical analysis and (b) a series of regression design validity tests.

Graphical analysis We carry out a graphical analysis to examine the density and distribution of our assignment variable and show evidence of discontinuity. We discuss a histogram and a density plot of $Margin$ showing its distribution along the zero cut-off (Figures 2 and 3). We then plot the margin of alignment, $Margin_{it}$, on the horizontal axis and the per capita central government grants of each district on the vertical axis in Figure 4. Recall that the results derive from the continuity-based RD design proposed by Cattaneo et al. (2018), with MSE-optimal bandwidth choice. For easier interpretation of the plots, the margin of vote is restricted to the range $[-40, 40]$, and estimates include the 95% confidence intervals. We make use of 40 bins in all our plots. The plots shown are those for the main sample of constant districts.

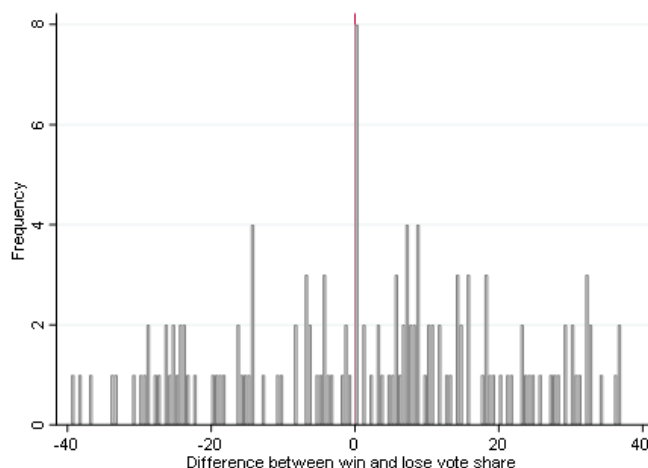


Figure 2: Histogram: Distribution of margin around zero for constant districts

Note: A histogram of margin of alignment for 39 constant districts for the period 1994-2014. The histogram is constructed for margin in the range $[-40, 40]$. The central line splits the distribution at the cut-off point of zero(0).

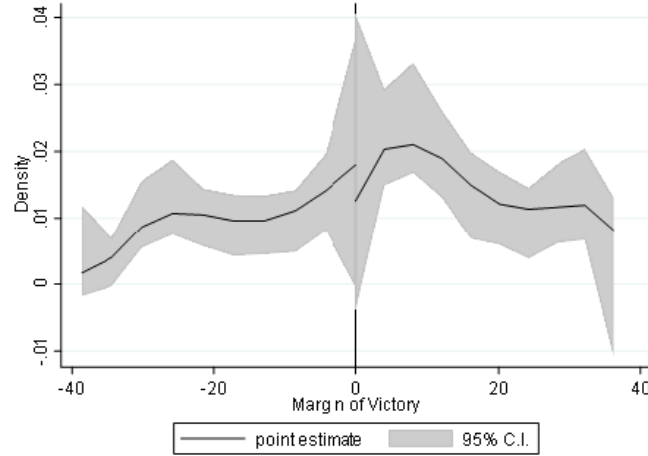


Figure 3: RD density plot of margin for constant districts

Note: A density plot of margin of alignment for 39 constant districts for the period 1994-2014. The central line splits the margin of alignment in the range $[-40, 40]$ at the cut-off point of zero(0). The shaded lines are the 95% confidence interval.

Figure 2 clearly shows that the margin of alignment, which is measured as the difference between win and lose vote share (i.e. margin of victory), is distributed around zero(0), with some districts *barely* aligned, other districts *barely* unaligned and more districts clearly won or lost. Figure 3 illustrates the discontinuity in margin of alignment with the density distribution along the cut-off of zero (0), clearly shown with a 95% confidence interval. This justifies our use of margin as the assignment variable.

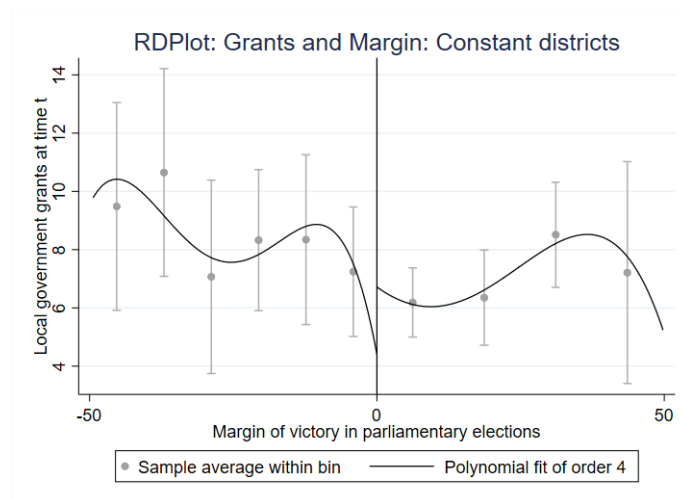


Figure 4: Grants and Margin

Figure 4 shows the RD plot of central government grants to DAs in real per capita terms. There is clear discontinuity in grants at the margin of alignment, with the distribution of grants along the cut-off of zero (0) shown with a 95% confidence interval.

Also evident is that – as we move away from the cut-off – unaligned districts (on the left side of the cut-off) tend to have higher grants compared to aligned districts (on the right side). However, the estimation fit – denoted by the length of the vertical lines or ‘whiskers’ extending from the sample average points – is less precise among unaligned districts, and decreases the further we move from the cut-off. Instead, on the right side of the cut-off we clearly see that central government grants tend to increase the larger the positive margin of alignment, which gives some preliminary evidence of core supporter reward. The strength of any alignment effect is tested below.

Regression-based design validity analysis For our other design validity test, we examine whether alignment exhibits discontinuity. We have already included pretreatment covariates in our specifications above, and the results are qualitatively similar. Another way of testing if political alignment exhibits discontinuity is to run a regression akin to our RDD model with each covariate as dependent variable and alignment and the control function as explanatory variables and examine whether the coefficients are significantly different from zero. The regression results are shown in Table A1 of the Appendix. None of the coefficients of the covariates is individually statistically significant. The individual F-statistics are statistically insignificant, as is the joint F -statistic (0.54 with a p-value of 0.46). We also test for discontinuity in the pretreatment characteristics, given the expectation that the pretreatment covariates are similar to the left and right of the cut-off. The results are given in Table A2 of the Appendix; they clearly show no discontinuity in the pretreatment characteristics, since the RD estimates for both total population and our income proxy are statistically insignificant ²⁴.

As a third regression validity test, we follow Lee and Lemieux (2010) and Bracco et al. (2015) and simultaneously test the null of discontinuities in all covariates, by estimating regressions with each covariate as dependent variable and alignment and the control function as explanatory variables and using higher order polynomials. The test is performed using a single system of equations within a Seemingly Unrelated Regression (SUR) framework. Using SUR provides efficiency in estimation by combining information on different estimations. We then perform a Chi-square test for the joint hypothesis that alignment is statistically insignificant in all regressions, implying zero discontinuity. The

²⁴The difference between the results in Tables A1 and A2 is that the former is a fixed effect estimation while the latter is a continuity-based RD estimation.

results in Table A3 in the Appendix show that we fail to reject the null hypothesis of zero discontinuity in all covariates in all polynomial orders of the margin of alignment. Hence, there is no evidence of discontinuity in our covariates.

In sum, our three additional specification tests have shown that political alignment exhibits discontinuity, since alignment has no effect on the pretreatment characteristics; the pretreatment characteristics do not have any influence at the discontinuity; and the pretreatment characteristics are similar to the left and to the right of the cut-off (i.e. there are no discontinuities in the covariates).

5.2.2 RDD estimation results

We present the RDD results in Table 3 for the constant districts (columns 1-2), full sample (columns 3-4) and one MP districts (columns 5-6). We show results for two variations of the RDD specifications, namely the RDD with year dummies only, and RDD with year dummies and controls ²⁵. Including additional covariates should however not have any significant effect on the estimation of the alignment effect, as such covariates only help to determine if alignment exhibits discontinuity (Pettersson-Lidbom 2008).

The RDD estimate shows a positive effect of alignment on grants for the constant districts in both the estimations with year dummies only and the estimations with year dummies and controls. That is, constant districts that are aligned receive between 4.9 and 6.3 times more central government grants. We therefore find clear evidence of political targeting of core supporters using intergovernmental transfers²⁶. The result is consistent and robust with or without the additional covariates, which proves that the addition of covariates becomes redundant when a control function is present. Our large RD estimates are not unusual, at least in the context of less-developed countries, as Brollo and Nannicini (2012) estimate similar coefficients for the effect of alignment on federal govern-

²⁵We do not report the results with neither year dummy nor controls as they are qualitatively similar to those with year dummies.

²⁶To confirm these results, we estimate an RD for ‘swing’ districts - districts in the full sample with $0 < margin \leq 10$. The results in Appendix Table A4 show a negative but statistically insignificant effect on grants for districts that are just aligned (swing districts). This is consistent with the argument advanced earlier that ‘swing voters’ are difficult to identify in a system with regular large shifts in voting patterns like Ghana. Accordingly, choosing districts that are aligned with a wide margin of votes is likely the safer bet for a government in power that is considering political targeting of transfers. Further, we try some sensitivity analysis at lower margins. That is given an optimal bandwidth of 40%, we determine the point between 10-40% margins at which the results turn positive. We use $h(15)$, $h(20)$, $h(25)$, $h(30)$, and $h(35)$, and find the results remain positive at all these bandwidths except when controls are introduced for $h(35)$. The results are given in Appendix Table A4.

ment transfers to municipalities in Brazil. Migueis (2013) and Bracco et al. (2015) find positive effects of alignment on central government transfers for Portuguese and Italian municipalities respectively, but their coefficients are smaller.

Table 3: RDD estimations for central government grants

	Constant districts		Full sample		One MP districts	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>RDEstimate</i>	4.887** (2.143)	6.335* (3.454)	0.539 (1.127)	0.034 (1.720)	1.152 (1.280)	-0.461 (1.695)
Observations	175	101	622	373	505	324
Year dummies	yes	yes	yes	yes	yes	yes
Other controls	no	yes	no	yes	no	yes

Note: Estimations are done using the fourth order polynomial. All regressions include a constant term. Robust standard errors are in parenthesis. The dependent variable is measured in real per capita terms. ***(**)(*) represent statistical significant at 1, 5 and 10 per cent levels respectively.

Using our full, unbalanced sample of districts over the whole period of study, there is no statistically significant effect of political alignment on central government grants to DAs, although the signs are consistent. The lack of statistically significant results in this larger sample is probably due to the presence of ‘noise’ in the data. Given that the number of districts increased over the period of study due to the creation of new districts, our estimations are being affected by the addition of new districts and the dropout and/or split of existing districts. Any political alignment effect that existed in the full sample is likely cancelled out by these major changes in district size and number (recall that the number of districts nearly doubled from 110 at the start of our period to 216 at the end in a multi-step fragmentation process).

The RDD result for the districts with one MP shows no statistically significant effect of alignment on central government grant allocations to such DAs, although the sign of the RD estimate in the estimation with year dummy only is similar to the corresponding results for the constant districts. However, the result proves not to be robust to the addition of further covariates and even changes sign. Note that districts with one MP are typically more rural districts; the lack of causal evidence for political targeting of transfers may speak in favor of the efforts of successive governments to foster development across the country.

In general, the lack of robustness across sample sizes in the causal effects of political alignment on intergovernmental grant allocation suggests that concerns over politically-

motivated district fragmentation and gerrymandering (see Riedl and Dickovick 2014; Mohammed 2015) have not (yet) translated into systematic targeting of funding along political alignment lines.

5.3 Robustness analysis

5.3.1 Other fiscal outcomes

We have found evidence of electoral cycles and political targeting in intergovernmental grant allocations, but what about other district fiscal outcomes such as total expenditure and internally generated funds (IGFs)?

The electoral cycle effect for local government total expenditures is similar to that found for grants (see Table A5 of the Appendix): there is an increase in national election years and in the year preceding the national election year, but a reduction in the mid-term of the four-year mandate of the central government. However, the coefficient of $EY * Align$ is now negative and statistically significant for district total expenditure, suggesting that aligned DAs have relatively lower levels of total expenditures in election years, perhaps because of targeting of swing districts in the crucial lead-up to elections. Sakurai and Menezes-Filho (2011) find similar results for total expenditures for local governments in Brazil. The electoral-cycle result does not seem to capture a systematic causal relation however: the RDD estimates for total expenditure are also consistent with those for grants, and the coefficient is statistically highly significant for the constant districts. Hence, aligned districts not only receive more grants, but also spend more on average compared with unaligned districts (see Table A7, Panel A).

Looking at local government IGFs, we also find confirmation for our main results for grants. IGFs increase in national election years and in the year preceding the national election year, but reduce in the mid-term of the four-year mandate of the central government (see Table A6). Similar to the case of grants, there is no significant difference between IGFs in election years for aligned and unaligned DAs. Again, the RDD estimates for IGFs are also consistent with those for grants and total expenditure, though results are not significant for our main sample once we add further controls, and for the full and one-MP samples (see Table A7, Panel B).

In sum, our main results for intergovernmental grants are consistent across local fiscal

outcomes, showing a significant impact of electoral cycles and political alignment.

5.3.2 Time-differences-in-differences

As a robustness check to the RDD procedure, we follow Sol-Oll and Sorribas-Navarro (2008) and adopt a *time-differences-in-differences* procedure. We again focus on central government grants and make use of data for successive terms of office to determine the effect of variations in political alignment on changes in the amount of central government grants received by the local government. We do this in two ways: (i) with the average of central government grants across successive terms of office; and (ii) with central government grants added up for the last two years of each central government's term of office divided by the population of the DA at the beginning of these two-year periods. The use of the latter set of data is justified by the fact that the incumbent central government's vested interest in the last two years of its term is likely to be to win the coming elections (see Sol-Oll and Sorribas-Navarro 2008).²⁷ The procedure simply involves estimating a fixed-effect equation with the variables in differences.

There are three advantages to the use of the *time-differences-in-differences* procedure. First, they adequately account for omitted-variable biases in the case of the control variables and other fixed individual characteristics of the DAs. Second, in the case of Ghana, we are less likely to suffer from changes in political alignment at the DA level during a term, e.g. through by-elections. These are extremely rare occurrences. Third, the homogeneous nature of DAs and Ghana's national elections across DAs provides relatively stable electoral features from one term of office to another, hence reducing the possibility of a correlation between changes in electoral features and changes in alignment status. On the downside, we can only consider time-differences-in-differences across successive terms for the constant districts sample, as new districts may only enter the full sample for one or two terms. This severely limits the statistical power of the estimations.

Using data for both the average and end-two-year real per capita grant for the constant districts, the coefficient of the alignment dummy is statistically insignificant (see Table A8 of the Appendix). This implies that there is no clear effect of changes in alignment on central government grants over successive terms of office and between the end periods of any two successive terms of office. However, it is worth noting that the direction of

²⁷Evidence of this is shown by the positive and statistically significant coefficient of the dummies for the election year and the year preceding the election year in our estimation results.

the effect determined here is similar to that found in the RDD estimation, i.e. positive.

6 Results on crowd-in or crowd-out effects

How do grants affect local government expenditure and IGFs? We now turn to the results for the crowd-in effect in Tables 4 and 5. In each table of results, Column 1 represents the results for the OLS estimation when grants are not instrumented; columns 2 and 3 represent the 2SLS results with the alignment dummy only as instruments; and columns 4 and 5 refer to the 2SLS results with the alignment dummy as well as the fourth-order polynomial function in Margin as instruments. The test statistics for the validity of the instruments used and the reliability of the results do not reject that our instruments are valid and reliable. Our estimations pass the tests of under-identification and weak identification, and the Hansen test for instrument validity in all cases. The F-statistic from the first-stage regression is below the rule-of-thumb threshold of 10 in three out of four cases, but there seems no glaring problem of weak instruments (Staiger and Stock 1997).

6.1 Expenditure per capita

The results for total expenditure are given in Table 4. In the OLS estimations, we find evidence of a crowd-in effect, with an increase in central government transfers linked to more local government spending. The estimated magnitude shows each *cedi* of grants is associated with up to 1.16 *cedis* (column 3) in per capita expenditure. This suggests grants are associated with approximately one-for-one increases in spending per capita. The estimated effect is statistically significant at the 1% level. The results are confirmed in both 2SLS estimations. When we instrument grants with the alignment dummy only, we find that local government expenditures increase by more than the proportionate increase in central government grants. In sum, there is consistent evidence of a crowd-in effect of central government grants on local government total expenditure per capita; this is the 'flypaper effect' suggested within the literature. Our finding is consistent with most of the empirical literature (e.g., Dahlberg et al. 2008), but contradicts Knight (2002) and Bracco et al. (2015).²⁸

²⁸As a robustness check, we make use of a second measure of expenditure, i.e. real per capita local government expenditure less central government grants *Expenditure2*. *Expenditure2* in effect shows local

Table 4: Crowd-in effect: Expenditure per capita

	OLS	2SLS Baseline Model		2SLS Polynomial function	
		1st stage Grants	2nd stage Expenditure	1st stage Grants	2nd stage Expenditure
	(1)	(2)	(3)	(4)	(5)
<i>Grants</i>	0.988*** (0.004)		1.158*** (0.087)		0.930*** (0.0417)
<i>Population</i>	0.167*** (0.049)	2.078*** (0.425)	-0.175 (0.196)	1.665*** (0.375)	0.273** (0.109)
<i>Private</i>	0.023 (0.020)	-0.896*** (0.127)	0.169** (0.083)	-0.784*** (0.175)	0.006 (0.045)
<i>Align</i>		-1.077*** (0.345)		-0.459 (0.509)	
Margin (4th poly)				Yes	
Margin (1st poly)				No	
Observations	1,099	1,099	1,099	366	366
R-squared	0.976	0.949		0.961	
F-statistic		9.73		7.69	
K-P(under)		9.73 (0.002)	9.733 (0.0018)	24.10 (0.0001)	24.098 (0.0001)
C-D (weak)	9.73	9.58	5.33	5.335	
K-P(weak)	9.58	9.731	7.69	7.688	
Hansen					3.582(0.310)

Note: All regressions include a constant term. Standard errors are in parentheses. Robust standard errors clustered at the district level. K-P(under), C-D(weak), K-P(weak), and Hansen represent Kleibergen-Paap rk LM statistic (underidentification), Cragg-Donald Wald F-statistic for weak identification, Kleibergen-Paap rk Wald D statistic for weak identification, and Hansen J statistic respectively. All fiscal variables are measured in real per capita terms. ***(**)(*) statistically significant at 1, 5 and 10 per cent levels respectively.

6.2 IGF per capita

We find in Table 5 that central government grants crowd-in locally-generated revenues on average. The evidence for crowding-in is consistent whether or not grants are instrumented, and whether or not the instruments include a polynomial function. In terms of the magnitude of the effect, each *cedi* of grants is associated with up to approximately 1.02 *cedi* per capita IGF (column 1). The OLS results show the largest effect, implying the coefficient of grants is biased upwards when we do not instrument central government grants. Hence, there is strong evidence that an increase in central government grants is associated with an increase in locally-generated revenues, which contradicts the reduction in government expenditure out of own revenues. The effect of grants on real per capita local government expenditure out of own revenues is qualitatively similar to the one here, confirming evidence of a crowd-in or flypaper effect. The results are available upon request.

tion in locally-generated revenues predicted by the median-voter model. We therefore find evidence of a crowd-in effect similar to Dahlberg et al. (2008).

Our results differ from the findings of Mogues and Benin (2012), who showed that central government grants crowd-out locally-generated revenues in Ghana. We argue that our results are more robust as we consider longer periods of study and address endogeneity concerns. The finding here is quite important, as the biggest part of central government transfers, the DACF, has in its criteria for allocation built-in incentives for raising own funds.²⁹ The implication is that where central government unconditional grants have built-in incentives to increase locally-generated revenues, an increase in central government grants can indeed be associated with an increase in locally-generated revenues.

²⁹This is a small incentive to improve on IGF in the form of a very small criteria weight (has been 5% for most years) for the so-called ‘responsiveness factor’ known as ‘percentage increase in IGF’ and is set to zero for DAs that do not have an increase (see Banful 2011; Mogues and Benin 2012).

Table 5: Crowd-in effect: IGF per capita

	OLS	2SLS Baseline Model		2SLS Polynomial function	
		1st stage Grants	2nd stage IGF	1st stage Grants	2nd stage IGF
	(1)	(2)	(3)	(4)	(5)
<i>Grants</i>	1.015*** (0.00655)		0.836*** (0.0636)		0.998*** (0.0460)
<i>Population</i>	0.421*** (0.0774)	1.665*** (0.307)	0.713*** (0.151)	1.656*** (0.372)	0.274** (0.117)
<i>Private</i>	0.404*** (0.0319)	0.712*** (0.110)	0.281*** (0.0571)	-0.773*** (0.172)	0.605*** (0.0561)
<i>Align</i>		-1.262*** (0.324)		-0.441 (0.498)	
Margin (4th poly)				Yes	
Margin (1st poly)				No	
Observations	1,478	1478	1,478	373	373
R-squared	0.949	0.922		0.950	
F-statistic		15.17		7.93	
K-P(under)		14.79 (0.0001)	14.789 (0.0001)	24.97 (0.0001)	24.970 (0.0001)
C-D (weak)		17.7	17.704	5.58	5.582
K-P(weak)		15.17	15.169	7.93	7.932
Hansen					6.609(0.0855)

Note: All regressions include a constant term. Standard errors are in parentheses. Robust standard errors clustered at the district level. K-P(under), C-D(weak), K-P(weak), and Hansen represent Kleibergen-Paap rk LM statistic (underidentification), Cragg-Donald Wald F-statistic for weak identification, Kleibergen-Paap rk Wald D statistic for weak identification, and Hansen J statistic respectively. All fiscal variables are measured in real per capita terms. ***(**)(*) represent statistical significant at 1, 5 and 10 per cent levels respectively.

7 Conclusions

The present paper examines the effect of political alignment on subnational fiscal outcomes in Ghana, which has a complex system prone to peculiar political pressures at the local district level. The paper also examines the crowd-in or flypaper effect. We use a new dataset for Ghana on central government grants to local governments, district budgets, and election outcomes spanning the years 1994-2014 and five national elections.

We find evidence of electoral cycle effects: grant allocations, district expenditure and IGFs are lower in the mid-term of the government's four-year mandate; increase in the year preceding the next national election year; and peak in election years. However, these electoral cycles manifest across districts, with no evidence of political alignment effects. We then apply a regression discontinuity design (RDD) by exploiting the discontinuity

in parliamentary vote margins of winning and losing parties at the threshold of zero (0), which allows alignment to be as good as randomly assigned. In our main RDD results for a balanced sample of constant districts for the whole period, we find evidence of political targeting of core supporters not only in intergovernmental transfers, but also in districts' expenditure patterns.

Finally, we show that there is a crowd-in effect of grants for both expenditure (a flypaper effect) and own revenues, using the instrumental variables (IV) approach proposed by Bracco et al. (2015) to identify causality. The evidence of a crowd-in effect for local governments' own revenues suggests that built-in incentives to increase IGF that are found in the main intergovernmental transfers, the District Assembly Common Fund, can in fact have the intended effect.

There has been an ongoing process of municipal fragmentation in Ghana since the current Constitution was adopted in 1992, which has led to an increase in the number of districts from 110 in 1994, to 216 at the end of our sample period. While our results are consistent when we vary the sample size - including all districts in the sample and districts with only one MP where it is easier to assign alignment - they are much weaker. This suggests that despite worries of politically-motivated municipal fragmentation and gerrymandering in Ghana, the process has in fact (probably inadvertently) watered-down any attempts at targeted intergovernmental transfers – and moreover done so more successfully than the obstacles to party favoritism that are built in to the decentralized system. Whether this persists in the future remains to be seen.

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Appendix

Table A1: Specification test of whether alignment exhibits discontinuity

	Population (1)	Private (2)
<i>Align</i>	0.0475 (0.0883)	-0.00649 (0.245)
Observations	190	113
F-statistic	1.81(0.0884)	1.56(0.1567)

Note: OLS regressions with *align* and the control function as independent variables. Standard errors are in parenthesis. Robust standard errors clustered at the district level. Regressions include constant term. The joint *F*-statistic is 0.54 with a p-value of 0.46.

Table A2: Specification test of whether covariates have an effect at the discontinuity

	Population (1)	Private (2)
<i>RDEstimate</i>	0.0754 (0.1040)	0.063 (0.3980)
Observations	190	113

Note: RDD estimations. Standard errors are in parenthesis. Robust Standard errors clustered at the district level. Regressions include a linear control function.

Table A3: Testing for the continuity of the covariates

Polynomial grade	Chi2(2) (1)	Prob>Chi2 (2)
0	5.46	0.0651
1	2.15	3.413
2	0.62	0.7334
3	1.54	0.4621
4	1.27	0.5306
5	0.15	0.9271
6	0.07	0.9656

Note: Chi-square tests results from a test of discontinuity in the covariates for the constant districts. A Seemingly Unrelated Regression (SUR) procedure is used similar to by Lee and Lemieux (2010) and implemented by Bracco et al. (2015).

Table A4: Sensitivity analysis for ‘swing’ districts and various bandwidth(h)

Sensitivity	RD Estimate	
	(1)	(2)
<i>Swing</i>	-4.034 (2.502)	-3.603 (4.446)
<i>h</i> (15)	1.181 (2.479)	1.306 (2.882)
<i>h</i> (20)	1.625 (1.802)	0.271 (2.214)
<i>h</i> (25)	1.208 (1.467)	-0.173 (1.933)
<i>h</i> (30)	1.03 (1.272)	0.039 (1.753)
<i>h</i> (35)	0.843 (1.195)	-0.151 (1.649)
Observations	622	373

Note: RDD estimations for districts with $0 < margin \leq 10$; swing districts-bandwidth $h(10)$, and sensitivity analysis for bandwidth $h(15)$, $h(20)$, $h(25)$, $h(30)$, and $h(35)$. Standard errors are in parenthesis. Robust standard errors clustered at the district level. ** represent statistical significant at 5 per cent levels respectively. Columns 1 and 2 represent results for RDD with year dummy and RDD with year dummy and controls respectively.

Table A5: Electoral cycle effect of Expenditure

	Constant districts			Full Sample			One MP districts		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Baseline	Cycle	Mediate	Baseline	Cycle	Mediate	Baseline	Cycle	Mediate
<i>EY</i>	2.420*** (0.228)	2.457*** (0.328)	3.125*** (0.391)	2.420*** (0.228)	2.457*** (0.328)	3.125*** (0.391)	1.807*** (0.874)	2.400*** (0.995)	1.710 (1.206)
<i>Population</i>	2.695* (1.462)	2.672* (1.462)	2.714* (1.465)	2.695* (1.462)	2.672* (1.462)	2.714* (1.465)	3.587* (1.918)	3.969*** (1.866)	3.570* (1.931)
<i>Private</i>	-3.550*** (0.542)	-3.660*** (0.574)	-3.565*** (0.538)	-3.550*** (0.542)	-3.660*** (0.574)	-3.565*** (0.538)	-4.730*** (0.695)	-5.274*** (0.629)	-4.752*** (0.753)
<i>EY_1</i>		0.376* (0.226)			0.376* (0.226)			1.160*** (0.440)	
<i>EY_2</i>		-0.398** (0.183)			-0.398** (0.183)			-0.0185 (0.344)	
<i>EY * Align</i>			-1.174* (0.597)			-1.174* (0.597)			0.237 (1.512)
Observations	1,109	1,109	1,109	1,109	1,109	1,109	162	162	162
R-squared	0.199	0.205	0.205	0.199	0.205	0.205	0.334	0.371	0.335

Note: Fixed effect estimations. All regressions include a constant term. Robust standard errors are in parenthesis. The dependent variable is measured in real per capita terms. *** (**)(*) represent statistical significant at 1, 5 and 10 per cent levels respectively.

Table A6: Electoral cycle effect of IGFs

	Constant districts				Full Sample				One MP districts		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
	Baseline	Cycle	Mediate	Baseline	Cycle	Mediate	Baseline	Cycle	Mediate		
<i>EY</i>	1.260*** (0.146)	1.196*** (0.177)	1.726*** (0.329)	1.260*** (0.146)	1.196*** (0.177)	1.726*** (0.329)	0.652 (0.589)	0.880 (0.633)	0.642 (0.906)		
<i>Population</i>	2.704** (1.323)	2.685** (1.320)	2.708** (1.323)	2.704** (1.323)	2.685** (1.320)	2.708** (1.323)	1.475 (1.072)	1.536 (1.080)	1.475 (1.073)		
<i>Private</i>	-2.386*** (0.370)	-2.417*** (0.378)	-2.394*** (0.367)	-2.386*** (0.370)	-2.417*** (0.378)	-2.394*** (0.367)	-3.413*** (0.689)	-3.599*** (0.694)	-3.414*** (0.720)		
<i>EY_1</i>		0.0701 (0.124)			0.0701 (0.124)			0.552** (0.239)			
<i>EY_2</i>		-0.270** (0.110)			-0.270** (0.110)			-0.0365 (0.247)			
<i>EY * Align</i>			-0.785 (0.492)			-0.785 (0.492)			0.0232 (1.383)		
Observations	1,485	1,485	1,485	1,485	1,485	1,485	202	202	202		
R-squared	0.143	0.144	0.146	0.143	0.144	0.146	0.257	0.269	0.257		

Note: Fixed effect estimations. All regressions include a constant term. Robust standard errors are in parenthesis. The dependent variable is measured in real per capita terms. *** (**)(*) represent statistical significant at 1, 5 and 10 per cent levels respectively.

Table A7: RDD estimations for expenditure and IGFs

	Constant districts		Full sample		One MP districts	
	(1)	(2)	(1)	(2)	(1)	(2)
Panel A: Expenditure						
<i>RDEstimate</i>	5.052***	6.510*	0.897	0.247	1.564	-0.0651
	(2.184)	(3.725)	(1.163)	(1.714)	(1.298)	(1.693)
<i>Observations</i>	175	101	615	369	499	321
Panel B: IGF						
<i>RDEstimate</i>	5.452***	6.297	1.228	(0.0157)	1.912	-0.902
	(2.106)	(4.026)	(1.235)	(1.658)	(1.344)	(1.607)
<i>Observations</i>	175	101	624	373	507	324

Note: Estimations are done using the fourth order polynomial. All regressions include a constant term. Robust standard errors are in parenthesis. The dependent variable is measured in real per capita terms. ***(**)(*) represent statistical significant at 1, 5 and 10 per cent levels respectively. Columns numbered 1 and 2 represent results for two variations of the RDD specifications namely, RDD with year dummies and RDD with year dummies and controls.

Table A8: Time-differences-in-differences estimation

	Constant	Constant_in_Term
	(1)	(2)
<i>Align</i>	1.720	0.147
	(1.983)	(1.098)
<i>Population</i>	-0.930	0.0709
	(1.836)	(1.577)
<i>Private</i>	-1.559	-1.289
	(1.299)	(1.669)
F-test (zero slopes)	0.75	0.21
F-test	0.83	0.02
Observations	150	75
R-squared	0.023	0.008

Note: Estimations done with all variables in first-difference. All regressions include a constant term. Robust standard errors are in parenthesis. The dependent variable is measured in real per capita terms. ***(**)(*) represent statistical significant at 1, 5 and 10 per cent levels respectively. ‘Constant’ refers to estimations using average real per capita grants across successive terms of office for the constant districts and ‘Constant_in_Term’ refers to estimations for constant districts using real per capita grants for the last two years of a government’s term of office.