

Segregation, Ethnic Favoritism, and the Strategic Targeting of Local Public Goods

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Abstract

This article demonstrates that ethnic segregation is a key determinant of local public goods provision. We argue that this results from politicians' strategic engagement in ethnic favoritism: Only when ethnic groups are sufficiently segregated can elites efficiently target coethnics with local public goods. We test this expectation with fine-grained data from Malawi on the spatial distribution of ethnic groups, geolocated distributive goods (water wells), and the ethnic identities of political elites. We find that members of parliament provide more local public goods to their electoral districts when ethnic groups are geographically segregated but that this increased investment is primarily targeted toward coethnics. Thus, while segregation promotes overall public goods provision, it also leads to greater favoritism in the distribution of these goods. Our logic and evidence provide an elite-driven explanation for both the considerable variation in ethnic favoritism across contexts and the underprovision of public goods in ethnically diverse settings.

Keywords

African politics, corruption and patronage, race, ethnicity and politics

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The expectation that political elites seek to favor their ethnic kin has long been a staple in the study of African politics (Bates, 1983; Joseph, 1987). A number of empirical studies show that coethnics of African political leaders have better health and educational outcomes (Franck & Rainer, 2012), superior infrastructure (Burgess, Jedwab, Miguel, Morjaria, & Padro i Miquel, 2015), and preferential access to foreign aid (Briggs, 2014; Jablonski, 2014). But the existing literature also demonstrates substantial variation in the prevalence of ethnic favoritism. For example, Franck and Rainer (2012) find strong evidence of ethnic favoritism in only six of the 18 African countries that they study, and Kramon and Posner (2013) demonstrate variation in ethnic favoritism both across African countries and across types of distributive goods within countries. These findings thus raise an important puzzle that has yet to be sufficiently addressed: Why is there ethnic favoritism in the distribution of local public goods in some contexts but not others?

We propose that *ethnic group segregation* helps account for variation in ethnic favoritism. In particular, we argue that segregation promotes greater overall investments in local public goods and leads to more ethnic favoritism in their distribution. This is because targeting coethnics with local public goods—which are locally nonexcludable but costly to access from distant locations—is difficult unless ethnic groups are sufficiently spatially segregated. Thus, we expect not only greater investments in local public goods in segregated contexts but also greater ethnic favoritism in the distribution of such goods where groups are segregated. This argument should apply to local public goods in contexts where political elites have discretion over distribution of the good, where the good is in demand from the population, and where the provision of the good is attributable to a particular individual leader.

We test this argument using data on Malawian members of parliament (MPs) and the provision of an important local public good within their electoral districts. Drawing on administrative records, we collect information on the allocation of new water wells (“boreholes”) between 1998 and 2008. We focus the analysis on boreholes because in Malawi these goods are in high demand and individual MPs have both formal and informal influence over their distribution. We use ethnicity data from 12,000 localities (roughly 2.3 square miles each) to construct an index of ethnic group segregation within each electoral district. This index distinguishes electoral districts that have large ethnic clusters—that is, several proximate localities dominated by one ethnicity—from electoral districts in which coethnics are not as spatially clustered. We also determine the share of the population within each locality that is ethnically matched with its MP. With these measures, we evaluate how segregation affects investments in local public goods *across* electoral districts as well as ethnic favoritism in the distribution of these goods *within* electoral districts.

Our results show that ethnic segregation is indeed a key predictor of both investments in and allocations of local public goods. First, we show that more boreholes were built in segregated districts, consistent with the expectation that being able to target coethnics with local public goods within districts encourages politicians to invest in these goods. Second, we observe more ethnic favoritism in the construction of new boreholes when ethnic groups are segregated: Using a difference-in-difference approach, we show that coethnic localities in segregated districts were 20% to 25% more likely to receive a new borehole between 1998 and 2008 than coethnic localities in less segregated districts. In a “placebo” test, we find no evidence that segregation shapes MPs’ allocation of *private* goods, which we would not expect to be affected by segregation. We also discuss and attempt to rule out potential alternative explanations, including collective action capacity, MP quality, residential sorting, and plurality group favoritism.

This article makes several contributions to research on local public goods provision, ethnic politics, and distributive politics. First, this study focuses explicitly on the nature of the link between ethnic segregation and local public goods provision, which is implicit in many studies of African politics. For example, scholars have long recognized that the spatial clustering of ethnic groups in Africa helps explain why ethnic divisions are so often salient for politics, especially those surrounding the distribution of state resources (e.g., Bates, 1983; Kasara, 2007; Kimenyi, 2006). While our direct empirical test of this assumption is a contribution to the literature, our more significant contribution is to make explicit theoretically why segregation should matter for local public goods provision, to demonstrate that segregation can vary considerably even within one country, and to show systematically that this variation is consequential for distributive politics. In this way, we add to a large body of existing research that has focused on the role of ethnic diversity in explaining variation in local public goods provision (e.g., Alesina, Baqir, & Easterly, 1999; Easterly & Levine, 1997; Habyarimana, Humphreys, Posner, & Weinstein, 2009; Miguel & Gugerty, 2005). We show that areas with similar levels of ethnic diversity can vary significantly in their degree of ethnic segregation (see Figure 2) and that this variation is consequential for overall levels of local public goods provision. Thus, while we are focused primarily on segregation rather than diversity, our theoretical framework linking ethnic segregation to local public goods investment introduces a top-down, elite-led explanation for why more diverse localities enjoy fewer local public goods.

Second, the quality of our data, our measure of ethnic segregation, and the subnational nature of our analysis offer new and more rigorous evidence that segregation shapes the degree to which political elites favor coethnic constituents in the provision of local public goods. While numerous studies

demonstrate a relationship between segregation and outcomes that may be related to differential investment in local public goods—intergroup inequality (Alesina, Michalopoulos, & Papaioannou, 2016; Baldwin & Huber, 2010), voter expectations of investment (Nathan, 2016), and ethnic voting and party organization (Alesina & Zhuravskaya, 2011; Ichino & Nathan, 2013; Ishiyama, 2012; Velasquez, 2013)—the two studies that directly analyze segregation's effect on ethnic favoritism do so at the national level and with mixed results (De Luca, Hodler, Raschky, & Valsecchi, 2015; Franck & Rainer, 2012). Our fine-grained census data allow us to use a higher quality measure of ethnic segregation than these previous studies, and our subnational research design allows us to better isolate the impact of ethnic segregation on distributive politics.¹

Third, we advance a growing literature linking ethnic demography to political outcomes. We show that ethnic demography impacts not only the behavior and attitudes of voters (Ichino & Nathan, 2013; Kasara, 2013) but also the distributive strategies of political leaders. In fact, our article complements Ichino and Nathan (2013), who argue that local ethnic minorities vote across ethnic lines in anticipation of benefiting from ethnic favoritism targeted at the majority group. Our findings not only confirm their assumption that leaders seek to favor their coethnics with local public goods but also demonstrate that this assumption only holds under certain conditions, namely, when ethnic groups are sufficiently segregated.

Finally, our findings have implications for the broader distributive politics literature, which emphasizes why political elites often favor some groups over others (Golden & Min, 2013). Sometimes, these groups are defined ethnically, while in other contexts, they follow caste, partisan, or religious cleavages. Regardless of how groups are defined, our framework suggests that their spatial distribution helps define the conditions under which politicians will use local public goods to engage in favoritism.

Segregation and Local Public Goods Provision

We build on the distributive politics literature to make predictions about how ethnic segregation shapes politicians' incentives to provide local public goods.² The theory should apply where the following conditions hold. First, the political elite of focus must have some *discretion* over distribution of the good of focus. For example, the segregation of an MP's coethnics should not be consequential if other actors in the political system, such as the president, have greater discretion over the distribution of the good, or if the good is allocated by formula or by bureaucrats who are sufficiently insulated from political interference. Second, there should be *demand* for the good in the

population. If a political leader has discretion over the allocation of a good, but will receive little credit for providing it, then ethnic segregation may not play a role. Third, and relatedly, voters should be able to *attribute* a good to the effort of particular leaders (Harding, 2015; Harding & Stasavage, 2014). That is, political leaders must be able to claim credit for the provision of the good, which allows them to secure the electoral and social benefits of targeting coethnics.

Our theory has four components: elite incentives to favor coethnics, budget constraints, the cost structure of local public goods, and ethnic segregation.

Incentives for Ethnic Favoritism

Three features of the political environment in much of Africa create incentives for ethnic favoritism. The first incentive arises from differences in politicians' ability to effectively target groups of voters with material benefits. As Dixit and Londregan (1996) note, politicians' greater understanding of some voters "translates into greater efficiency in the allocation of particularistic benefits" (p. 1134). This relative efficiency defines a "core" constituency (Cox & McCubbins, 1986). The theoretical literature highlights that politicians are likely to favor their core electoral districts in contexts where ideological or programmatic differences between parties are small (Cox & McCubbins, 1986; Dixit and Londregan, 1996), as is largely the case in Africa (Posner, 2005).

In much of Africa, core supporters are ethnically defined: Politicians are able to allocate distributive goods more efficiently to coethnics than to non-coethnics.³ For example, Carlson (2015) finds that Ugandan voters disproportionately reward the provision of services by coethnic politicians; Wantchekon (2003) finds that clientelist appeals are more effective when delivered by coethnics; Kramon finds that vote buying in Kenya is more effective when politicians target coethnics; and Adida, Gottlieb, Kramon, and McClendon (2016) find that voters only reward good legislative performance of coethnic incumbents but do not reward good performance by noncoethnic incumbents. These results are likely driven by several factors. Strong expectations of ethnic favoritism, distrust of out-group politicians, or cognitive biases may cause voters to discount or ignore the provision of resources by noncoethnic elites (Bates, 1983; Carlson, 2015; Posner, 2005). Politicians may also be better at engaging politically useful intermediaries in their ethnic home areas (Kasara, 2007). Intermediaries can enhance the efficiency of resource distribution by providing elites with greater knowledge of their coethnics' preferences and by monitoring and mobilizing communities to ensure that they support the incumbent (Nichter, 2008; Stokes, Dunning, Nazareno, & Brusco, 2013).

Second, broader strategic considerations may also drive coethnic targeting. Theories of neopatrimonial politics highlight that there is often an ethnic calculus to coalition-building (Joseph, 1987; van de Walle, 2003). African presidents allocate cabinet positions to elites from different ethnic groups in exchange for regime support or the delivery of ethnic voting blocs (Arriola, 2009). These posts come with opportunities for rent-seeking and discretion over the distribution of jobs and resources. As cabinet positions are typically allocated to elites who can deliver the support of their ethnic community, MPs have incentives to maintain strong support among their coethnics to enhance their pre- and postelection bargaining position (van de Walle, 2003).

Third, there are social and psychological drivers of coethnic favoritism. Political elites often face strong informal pressures to take care of their “own” (Lindberg, 2003). Voters generally expect to benefit when their coethnics are in power (Posner, 2005), and elites may lose social standing or face social sanctioning if they fail to deliver (Bates, 1983). In Ghana, for example, Lindberg (2010) finds that “everyday tools of shame, harassment, collective punishment of the family, and loss of prestige and status” (p. 136) serve as informal pressures on MPs. Moreover, consistent with social identity theory (e.g., Tajfel & Turner, 1985), elites may derive psychological benefits from favoring in-group members (Ekeh, 1975).

For all these reasons, we anticipate that politicians will have incentives to favor coethnic citizens over noncoethnics in local public goods provision. We do not claim that politicians *never* have incentives to allocate goods to noncoethnics: We recognize that voters sometimes support noncoethnic politicians (Conroy-Krutz, 2012; Ichino & Nathan, 2013) and politicians sometimes provide local public goods to noncoethnic voters. Our theory only requires that the political or personal returns to coethnic provision are higher, on average, than the returns to noncoethnic provision.

Budget Constraints

Our second component highlights politicians’ budget constraints. While incumbents often have incentives to disproportionately serve coethnics, they can choose to do this in a variety of ways. In addition, there are many other political activities they could engage in, such as legislating or raising campaign contributions. Limited time and resources mean that they must prioritize some activities over others. Thus, even if they have the discretion to build new local public goods within their electoral district, they may not do so if they think other activities carry higher political returns. It is therefore necessary to understand the conditions under which politicians are motivated to

allocate local public goods. The final two components of our theory jointly specify such conditions.

Cost Structure of Local Public Goods

The cost structure of local public goods influences when politicians will be motivated to invest in them. Local public goods have relatively high fixed costs but relatively low marginal costs. Compared with providing a private good like cash or an agricultural subsidy, a politician must invest more resources to ensure that a local public good is constructed. But once that fixed cost is paid, additional beneficiaries come at almost no extra cost. This implies that politicians will prefer to invest in local public goods only when they benefit a sufficient number of (electorally responsive) residents—coethnics—in a given local community.

Ethnic Segregation

In sum, politicians often have incentives to favor their own ethnic group, must choose among many potential strategies to do so, and will choose local public goods only if these goods will benefit a sufficient number of coethnic residents. When these conditions are met, ethnic segregation should impact the degree to which politicians invest in local public goods as well as where within their electoral district they choose to allocate these goods.

The logic is demonstrated in Figure 1, which shows two hypothetical electoral districts with identical levels of diversity, population size, and population density, but different residential patterns of a politician's coethnic (gray squares) and noncoethnic (black dots) constituents across localities (solid lines). While ethnically matched localities have the same percentage of MP coethnics in both electoral districts, coethnic localities in the more segregated district are surrounded by other coethnic localities, but coethnic localities in the less segregated district are interspersed with localities populated by other ethnic groups. As the catchment area of local public goods often crosses locality boundaries (illustrated by the transparent circle), local public goods benefit more coethnics when coethnic localities are spatially clustered. Because more coethnics benefit under segregation, there is a higher chance that the relatively high fixed cost of a good can be justified by MPs under segregation than under integration. This logic generates our first observable implication:

Hypothesis 1 (H1): Investments in local public goods will be greater in electoral districts where members of the MP's ethnic group are spatially segregated from members of other ethnic groups.

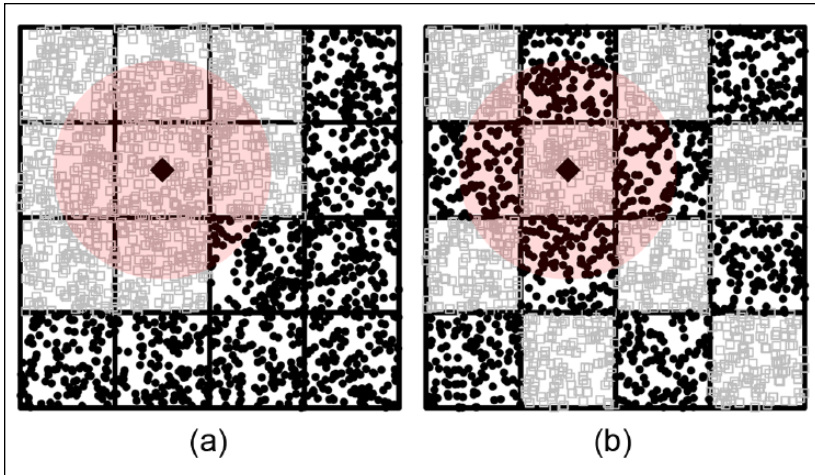


Figure 1. Two hypothetical electoral districts with different levels of segregation. Assume that (a) and (b) represent two electoral districts, each of which is divided into 16 localities. Each locality is populated by a politician's coethnics (gray squares) or noncoethnics (black dots). The diamond shows the location of a local public good, and the transparent circle represents its catchment area. Ethnic diversity, population size, and population density—three predictors of local public goods investment—are held constant across the electoral districts. Coethnic localities have the same proportion of coethnics. The figure illustrates that more coethnics benefit from the local public good in (a)—the more segregated district—than in (b). This figure relates to Figure 1 in Ichino and Nathan (2013), which shows how local ethnic geography influences voters. The relationship of these two figures highlights complementarities between our arguments.

If greater local public goods provision in segregated electoral districts is indeed driven by incentives for ethnic favoritism, such goods should be disproportionately allocated to coethnic localities within segregated electoral districts. This expectation is consistent with prior research on ethnic favoritism in local public goods provision (e.g., Burgess et al., 2015; Ichino & Nathan, 2013) but adds the novel expectation that segregation will condition the degree to which MPs engage in ethnic favoritism.

Hypothesis 2 (H2): Within electoral districts, ethnic favoritism in the distribution of local public goods will increase with ethnic segregation.

Malawian Context

We test our theory using disaggregated data gathered in the ethnically diverse country of Malawi.⁴ While there are more than 12 distinct ethnic

communities, early European contact and subsequent colonial rule reinforced three main ethnoregional identities in Malawi—the Tumbuka in the North, the Chewa in the Center, and the Yao in the South—based on the dominant group within each of the country’s regions (Vail & White, 1991). These ethnic divisions have been relevant for political behavior at least since the introduction of multiparty elections in 1994 (Posner, 2004), partly due to their regional segregation. Voting has typically fallen along ethnoregional lines, although this pattern was weakest in the 2009 election, when the incumbent president received widespread support across regions (Ferree & Horowitz, 2010).⁵

We focus on members of Malawi’s unicameral parliament, the National Assembly, who are elected by plurality vote in 193 single-member electoral districts. Within this first-past-the-post system, the vote share needed to secure a seat depends on the number of other candidates contesting. In 1999, the median number of candidates per electoral district was 3, but this increased to 6 in 2004 and 2009. As a result, the vote share among elected MPs decreased from 68% in 1999 to 49% in 2004 and 46% in 2009. Under these conditions, ethnic favoritism by incumbent MPs is electorally viable whenever the MP’s ethnic group comprises a plurality of the electoral district. Under the period of study considered here, Malawian MPs matched the plurality ethnic group in more than 70% of electoral districts. However, even when the MP’s ethnic group does not constitute a plurality, he or she may still have nonelectoral incentives for favoring coethnics, as discussed above. This may be especially true in the Malawian context, where reelection rates among MPs are quite low (32% in 2004 and 25% in 2009).

One way for MPs to favor coethnics within their electoral district is through the targeted provision of local public goods. As in many African countries, Malawi has an institutional structure in which politicians exert significant leverage over the allocation of local public goods, and MPs play a crucial role in the planning, funding, and management of such goods in their electoral districts. Formal responsibility for the provision of these goods lies with District Assemblies, which by law comprise MPs and locally elected councilors (Chinsinga, 2005). However, local-level elections for councilors were not held until 2000, and after their first term expired in 2005, councilors were never again elected during the period under study. Thus, local development initiatives were largely left to MPs and centrally appointed district officials (Chasukwa, Chiweza, & Chikapa-Jamali, 2014), but MPs also heavily influence the decisions made by district officials (O’Neil et al., 2014). MPs also exert considerable *informal* influence over the allocation of local public goods. As local “big men,” they lobby for and influence development projects funded by the central government and nongovernmental organizations (NGOs; Cammack, Golooba-Mutebi, Kanyongolo, & O’Neil, 2007; Chasukwa et al.,

2014). As a result of this discretion, MPs have increasingly focused on delivering development projects (Cammack et al., 2007; Chinsinga, 2007, 2009), a trend that mirrors dynamics in other parts of Africa (Lindberg, 2010). Voters' expectations that MPs should provide public goods are reflected in public opinion data: Surveys from 2003 and 2007 show that a vast majority of Malawians would prefer an MP who delivered local public goods over one who implemented sound public policy and produced nationally beneficial legislation (Mthinda & Khaila, 2006; Tsoka & Chinsinga, 2009).

Our main analysis focuses on MPs and the provision of new water wells—"boreholes"—for three reasons. First, *demand* for boreholes is high across Malawi (DeGabriele, 2002). Almost half of all rural Malawians had no access to a protected water source in 1998 (Government of Malawi, 1998), and boreholes are overwhelmingly the main protected water source in rural Malawi (Baumann & Danert, 2008), although boreholes are in used in urban areas as well (National Statistical Office of Malawi & ORC Macro, 2001).⁶ Dionne (2012) reports that rural Malawians and village headmen in three rural districts ranked access to clean water as their community's single greatest need.

Second, MPs have significant *discretion* over the provision of boreholes in their electoral districts. Many reports on water access in Malawi note the pervasive influence of politics and favoritism, especially on behalf of MPs, in the construction of new boreholes (e.g., Ferguson & Mulwafu, 2004; WaterAid, 2008, 2010). The relatively low cost of borehole provision—roughly US\$5000 (Baumann & Danert, 2008)—means that MPs can use their personal or CDF (Constituency Development Fund) funds to provide them on their own, giving the MP full discretion over provision. In Dowa, for example, an MP was hailed by constituents for drilling 125 boreholes over 3 years using "personal money through her development office" ("Dr. Jean Kalilani Rating High in Dowa," 2014). MPs also impact the placement of government-funded borehole projects by, for example, lobbying the Ministry of Irrigation and Water Development or through their outsized influence in district development councils (O'Neil et al., 2014). MPs also influence the placement of boreholes provided by other actors, such as international NGOs, through informal pressure or partnerships. One Malawian MP described this process as going "shopping for people who can assist" once she could no longer fund additional development in her district (Gilman, 2009, p. 198).

Finally, borehole provision can be directly *attributed* to MP effort. For example, MPs claim and receive credit for borehole projects, even when they have not provided the direct funding: The MP for Zomba-Likangala, for example, was credited with building a borehole despite the funds being provided by an international NGO ("MP Commissions K1.6m Borehole in Zomba," 2012). When MPs use their CDF funds on water projects,

constituents understand that the resources have come from the MPs' personal fund ("Dr. Jean Kalilani Rating High in Dowa," 2014). Constituents also hold MPs accountable for a lack of borehole provision, and there is an example of constituents seeking to replace their MP precisely because he failed to provide boreholes in his constituency (Nyirenda, 2014). In sum, boreholes are in high demand in Malawi, MPs have significant discretion over their allocation, and constituents generally attribute their provision to MP effort. These characteristics make boreholes an excellent local public good with which to test the theory's implication for ethnic favoritism by Malawian MPs.

Data and Measurement

We assemble data at two different geographic levels. Our smallest units of observation are 12,380 census enumeration areas, which we call "localities." On average, 1,000 people reside in these localities (Table SI.2 in Supporting Information [SI]). Because the localities are small—on average 6 square kilometers—the catchment area of many local public goods crosses locality boundaries. Our theory thus predicts that the decision to provide a public good to a given locality will depend on that locality's ethnic connection to the political leader *and* on the political leader's ethnic connection to surrounding localities. Our second units of observation are 193 electoral districts, within which localities are nested.⁷ On average, an electoral district includes 64 localities.

We construct three key measures. First, we extract the geographic coordinates of all boreholes from maps produced from the 1998 and the 2008 censuses, which were provided to us by the National Statistics Office. By subtracting the boreholes that were already present in 1998 from those present in 2008, we determine the location of all *new* boreholes built during that 10-year period (see Figure SI.2 in the SI). From this, we construct an electoral district-level count of the number of new boreholes (on average, 39) and a dichotomous locality-level indicator for whether or not each locality received a new borehole between 1998 and 2008 (33% did).⁸

Second, we assemble an original dataset on the ethnic identity of each Malawian MP who served between 1994 and 2009 (details in SI). We combine this information with census data on the ethnic make-up of each locality to create two measures of ethnic match between an MP and each of the localities within his or her electoral district.⁹ The first measure, *Match*, is equal to 1 if the MP was of the same ethnicity as the largest group within that locality at anytime between 1999 and 2008, and 0 otherwise. By this measure, 76% of localities were matched at some point. The second measure, *Match Proportion*, is equal to the proportion of the locality's population from the

MP's ethnic group.¹⁰ The average proportion of the locality's population from the same ethnic group as the MP was 0.59. Figure SI.3 maps the spatial variation in these ethnic match variables across Malawi. Ethnically matched localities exist in large numbers in electoral districts at all levels of ethnic segregation, making it possible for MPs to favor ethnically matched localities in even the least segregated settings.

Finally, we calculate a measure of ethnic segregation for each electoral district based on the ethnic demography of all localities within it.¹¹ We employ the spatial dissimilarity index (Reardon & O'Sullivan, 2004), a widely used measure of segregation, which ranges between 0 and 1 with higher values indicating greater segregation (details in SI). Using this index, we measure how segregated the MP's ethnic group is from other ethnic groups in each electoral district across the two legislative terms in 1998-2008.¹² If the ethnicity of the MP changed between the legislative terms, we average across the two MP-specific segregation measures. We do not measure segregation for the 10 most ethnically homogeneous electoral districts ($ELF < 0.05$): Ethnic segregation is only meaningful with at least some ethnic diversity, and a small number of minority group members exert undue influence on segregation measures amid low diversity (Reardon & O'Sullivan, 2004).¹³

To illustrate what our segregation measure captures, Figure 2 shows that two electoral districts with similar levels of diversity (scores of 0.51 and 0.65) can differ markedly in their degree of segregation (segregation scores of 0.70 and 0.21). Figure SI.6 further emphasizes the degree of variation in segregation at all levels of ethnic diversity. In addition to this continuous measure of segregation, we also classify each electoral district into low, medium, or high segregation categories based on terciles of the spatial dissimilarity index: Low segregation is below 0.401, medium between 0.401 and 0.490, and high above 0.490.¹⁴ Figure SI.5 in the SI shows example electoral districts in each category, which have segregation indices roughly equal to the median for each category, and Figure SI.4 of the SI shows the variation in segregation across electoral districts.

Segregation and Local Public Goods Provision Across Electoral Districts

Our theory predicts that investments in local public goods should be higher in ethnically segregated electoral districts (H1). Figure SI.7 shows a positive bivariate relationship between the number of boreholes built in 1998-2008 and ethnic segregation across Malawi's electoral districts. To account for

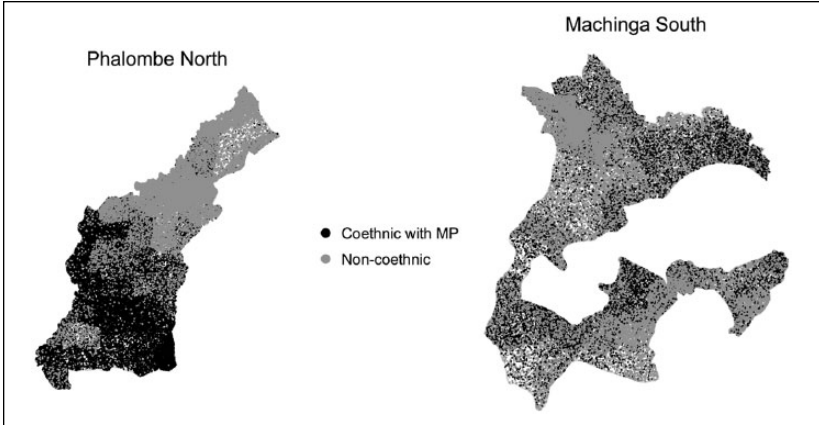


Figure 2. Ethnic segregation in two electoral districts.

This figure provides an example of two electoral districts with similar levels of diversity but different segregation scores. The spatial dissimilarity score for the MP's ethnic group is 0.70 in Phalombe North and 0.21 in Machinga South. Each dot represents one individual (shaded according to ethnic match with the MP). MP = member of parliament.

several potential confounders, we rely on a regression framework. Because our outcome variable is the count of boreholes built in an electoral district, we use a Poisson model modified to account for overdispersion in the data (Gelman & Hill, 2006; Wooldridge, 1997).¹⁵ We model the number of new boreholes an electoral district receives (y_d) as follows:

$$y_d \sim \text{overdispersed Poisson}(\theta_d, \omega), \quad \theta_d = \exp(\alpha_{a[d]} + \beta \text{Seg}_d + X'_d \gamma), \quad (1)$$

where ω is an overdispersion parameter estimated from the data, and where d indexes electoral districts and a administrative districts. Our main variable of interest is Seg , which measures ethnic segregation. In Equation 1, Seg is continuous, which assumes a linear relationship (on a log-count scale) between segregation and borehole investments. To allow for nonlinearities, we also present results from a model that includes two dummy variables indicating medium and high segregation, leaving electoral districts with low segregation as the omitted reference category. We include in vector X_d a set of electoral district-level covariates that are likely predictors of borehole investments. In a first model, we include controls for ethnic diversity (ELF), the (natural log of the) proportion of the electoral district's area that is urban,¹⁶ land area in square kilometers, and boreholes per 10,000 residents in 1998. Together, these variables capture indicators of collective action capacity, as

well as demand and need for boreholes. In a second model, we expand the list of covariates to include the degree of MP electoral competition, MP coethnic share of the population, and presidential coethnic population share, all of which help account for national-level political influences. We also further control for need using the number of NGO-funded water aid projects per capita and all aid projects per capita using geocoded project locations from the AidData project (Strandow, Findley, Nielson, & Powell, 2011), and each electoral district's accessibility with a measure of distance to the nearest major city (Lilongwe or Blantyre). In all models, we also include administrative district fixed effects, $\alpha_{d[ci]}$, because important decisions, including borehole allocation, are often made at this level.¹⁷

The results in Table 1 show that segregation is a robust positive predictor of new borehole investments. The coefficients on segregation are positive, statistically significant, and substantively large. Given Model 1, and holding covariates at their mean or mode, we would expect highly segregated districts (90th percentile on our segregation index) to invest in 17 more boreholes than less segregated districts (10th percentile), with a 95% confidence interval (CI) of [3, 39].¹⁸ The effects are comparable with the effect of ethnic diversity: Highly diverse electoral districts (90th percentile on ELF) invest in 18 fewer boreholes, on average, than low diversity electoral districts (10th percentile), with a 95% CI of [-46, -2]. Models 3 and 4, which use two dummy variables instead of a continuous measure of segregation, confirm these results. Given Model 3, we would expect electoral districts with medium segregation to invest in 11 more boreholes than electoral districts with low segregation (95% CI = [3, 24]), and electoral districts with high segregation to invest in 10 additional boreholes (95% CI = [1, 23]).

Segregation and Ethnic Favoritism Within Electoral Districts

We next evaluate whether ethnic favoritism within electoral districts increases with segregation (H2). We use a set of difference-in-differences to test this hypothesis. We examine the 3,502 localities in 120 electoral districts that were *not* ethnically matched with their MP prior to 1999 (based on parliamentary elections in 1994). In the 1999 and 2004 elections, 55 of those 120 districts experienced a change in the ethnicity of their MP, resulting in 1599 localities becoming ethnically matched with their MP and 1903 localities remaining unmatched. Thus we observe two groups of localities in two time periods: *Group 1 localities* were not matched in the first period (1994-1998) or in the second period (1999-2009), whereas *Group 2 localities* were not

Table 1. Segregation and Borehole Investments Across Electoral Districts.

	Dependent variable			
	Number of new boreholes			
	(1)	(2)	(3)	(4)
Segregation (continuous)	1.86** (0.72)	1.76** (0.76)		
Dummy for medium segregation			0.43*** (0.15)	0.50*** (0.16)
Dummy for high segregation			0.38** (0.17)	0.38** (0.19)
Ethnic diversity (ELF)	-0.89** (0.39)	-0.63 (0.61)	-0.86** (0.38)	-0.45 (0.60)
Population density (ln)	0.52*** (0.20)	0.41* (0.21)	0.38** (0.18)	0.25 (0.20)
Urban proportion (ln)	-0.05 (0.04)	-0.02 (0.04)	-0.04 (0.04)	-0.02 (0.04)
Land area (square kilometer) (ln)	0.69*** (0.15)	0.63*** (0.15)	0.66*** (0.14)	0.56*** (0.15)
Boreholes per 10,000 residents in 1998	0.24** (0.09)	0.23** (0.10)	0.24*** (0.09)	0.22** (0.09)
Electoral competitiveness		0.005 (0.005)		0.01 (0.005)
MP coethnic population share		0.02 (0.42)		0.16 (0.42)
President coethnic population share		0.78 (1.14)		0.50 (1.13)
Distance to nearest city (ln)		0.31 (0.83)		-0.03 (0.82)
Water aid projects per 10,000 residents		0.31 (0.47)		0.07 (0.49)
All aid projects per 10,000 residents		-0.07 (0.05)		-0.05 (0.05)
Constant	-0.62 (0.82)	-2.25 (4.84)	-0.19 (0.80)	0.05 (4.82)
Administrative district fixed effects	✓	✓	✓	✓
Observations	183	182	183	182

MP = member of parliament.

* $p < .1$. ** $p < .05$. *** $p < .01$.

matched in the first period but became matched in the second (i.e., Group 2 localities experienced a “coethnic switch”).

The goal of our difference-in-differences approach is to estimate the effect of the coethnic switch experienced by Group 2, using the time-trend of Group 1 as a counterfactual. This approach allows us to hold constant any time-invariant locality characteristics that influence public goods provision, including local ethnic diversity, collective-action capacity, and locality demand for public goods.¹⁹ As discussed above, we implement this approach using *Match*, a dummy variable equal to 1 for matched localities in the second time period. (That is, *Match* equals 0 for Group 1 localities in both time periods and for Group 2 localities in the first time period.) We then estimate the probability that a locality i has a borehole in year $t \in \{1998, 2008\}$ using the following model:

$$y_{it} = \alpha_i + \gamma_t + \beta Match_{it} + e_{it}. \quad (2)$$

We include locality fixed effects, represented by α_i , as well as a time period fixed effect (γ_t).²⁰ The outcome, y_{it} , is a dummy variable indicating the presence of a borehole. We use this equation to estimate β , which gives the change in probability of borehole provision given a coethnic switch (relative to no coethnic switch), which we interpret as the degree of ethnic favoritism.

To estimate how ethnic favoritism is conditioned by segregation, we use two strategies. First, we run Equation 2 among three subsets of electoral districts based on their levels of segregation. We again use the terciles of the spatial dissimilarity measure to group districts into low, medium, and high segregation. Second, we add interactions to Equation 2, interacting indicators for medium and high segregation with *Match*. We also run a model that interacts *Match* with a continuous measure of segregation. We estimate linear probability models and cluster the standard errors on localities to account for the panel structure of the data.²¹ We repeat all analyses with the continuous indicator of MP-locality ethnic match, *Match Proportion*.

To illustrate the approach, we begin by implementing a simple nonparametric test, presented in Figure 3. We calculate the proportion of localities that have at least one borehole, by time period (1998 versus 2008) and whether the locality experienced a coethnic switch. Thus, we are simply comparing four means at each level of segregation. This analysis indicates little or no ethnic favoritism at low levels of segregation: 2.3% of Group 1 localities and 4.5% of Group 2 localities had a borehole prior to 1998, which increased to 30.1% (Group 1) and 35.3% (Group 2) by 2008. In contrast, ethnic favoritism was prevalent in moderately and highly segregated elections districts. In these districts, Group 1 and 2 localities had similar levels of

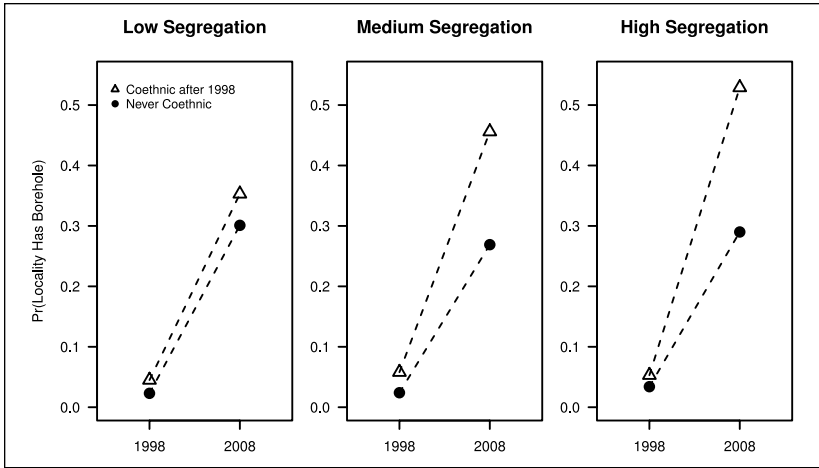


Figure 3. Ethnic favoritism is more likely in segregated electoral districts. Analysis includes 3,502 localities nested in 120 electoral districts. All of these localities were not coethnic with their MP in 1998. In total, 1,599 became coethnic with their MP in either the 1999 or the 2004 parliamentary elections; these are denoted with a triangle. The 1903 localities denoted with a circle were never coethnic with their MP in the study period. MP = member of parliament.

borehole provision prior to 1998, but localities that experienced a coethnic switch had a much higher chance of receiving a borehole by 2008. The difference-in-differences is 15.2 percentage points in election districts with medium levels of segregation, and 22.1 percentage points in districts with high levels of segregation.

The regression results in Table 2 confirm that segregation spurs ethnic favoritism after adjusting for confounders. When we run Equation 2 in three subsets of election districts, based on their segregation levels, we find evidence of ethnic favoritism only in moderately and highly segregated electoral districts (Models 1-3 in Panel A). This finding remains when we run models that include all electoral districts and interact *Match* with two segregation dummies (Models 4-6). In moderately segregated districts, localities that experienced a coethnic switch were 7 to 16 percentage points more likely to receive a borehole than localities that were never ethnically matched, a difference that can be distinguished from 0 at conventional levels of confidence. In highly segregated districts, localities with a coethnic switch were 15 to 21 percentage points more likely to receive a borehole than localities without a coethnic MP ($p < .01$). These results are robust to the inclusion of a set of time-varying covariates, including the locality's ethnic match with the

Table 2. Segregation and Ethnic Favoritism in the Provision of Boreholes.

	Low	Medium	High	All	All	All
	(1)	(2)	(3)	(4)	(5)	(6)
	(1)	(2)	(3)	(4)	(5)	(6)
A. Match with MP: Largest ethnic group in locality						
Match with MP	0.03 (0.04)	0.16*** (0.03)	0.21*** (0.06)	0.05 (0.03)	0.03 (0.03)	0.05* (0.03)
Match × Medium Segregation				0.08** (0.04)	0.09** (0.04)	0.07* (0.04)
Match × High Segregation				0.18*** (0.06)	0.18*** (0.06)	0.15*** (0.06)
Match × Continuous Segregation						0.29* (0.16)
B. Match with MP: Proportion coethnic						
Match with MP	0.13** (0.06)	0.20*** (0.05)	0.57*** (0.15)	0.12** (0.05)	0.09* (0.05)	0.12** (0.05)
Match × Medium Segregation				0.06 (0.06)	0.09 (0.06)	0.10 (0.06)
Match × High Segregation				0.49*** (0.14)	0.48*** (0.14)	0.47*** (0.14)
Match × Continuous Segregation						0.96*** (0.47)

(continued)

Table 2. (continued)

	Low	Medium	High	All	All	All	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Locality fixed effects	✓	✓	✓	✓	✓	✓	✓
Time period fixed effects	✓	✓	✓	✓	✓	✓	✓
Time varying controls					✓	✓	✓
Fixed Controls x Time Period						✓	✓
Number of electoral districts	42	43	35	120	120	120	120
Number of localities	1,315	1,542	645	3,502	3,502	3,502	3,502
Number of observations	2,630	3,084	1,290	7,004	7,004	7,004	7,004

The table shows difference-in-differences estimates of a locality–MP ethnic match, for different levels of segregation. The dependent variable is an indicator for whether a locality has a borehole. Columns (1) to (3) include a subset of electoral districts based on their segregation levels (low, medium, and high, respectively), whereas (4) to (7) include electoral districts across all levels of segregation. Panel A uses the locality’s largest ethnic group to define MP ethnic match (*Match*), while Panel B uses the MP’s share of coethnics (*Match Proportion*). Models with time-varying controls include controls for ethnic match with the president and the presence of a health clinic or school in the locality. Models with fixed controls interacted with the time period dummy include time period interactions with an indicator of whether the locality is urban, population density (logged), ethnolinguistic fractionalization, area (square kilometer), distance to Lilongwe, distance to Blantyre, and the number of boreholes per capita in 1998. The table shows that ethnic favoritism is more prevalent when the MP’s electoral district is more ethnically segregated.

MP = member of parliament.
 * $p < .1$. ** $p < .05$. *** $p < .01$.

president and the presence of other local public goods (Model 5). The results are also robust to the inclusion of controls that interact the time period dummy with fixed characteristics of the locality (Model 6).²² Finally, we also find similar results when we interact *Match* with a continuous measure of electoral district segregation (Model 7). In short, we find robust evidence of ethnic favoritism, which is more pronounced in moderately and highly segregated electoral districts.²³

Panel B of Table 2 presents results of analyses that use the proportion of the MP's coethnics in the locality to define an ethnic match (i.e., these analyses replace *Match* with *Match Proportion*). We find that all indicators of *Match Proportion* are statistically significant but that the magnitude of the effect substantially increases with the degree of segregation, suggesting a greater degree of ethnic favoritism in segregated electoral districts (Models 1-3). In low segregation districts, increasing the proportion of the MP's coethnics in a locality from 0 to 0.5 (a fairly typical change) corresponds to about a 6.5 percentage point increase in the probability that the locality receives a borehole. In high segregation districts, this same change predicts about a 28.5 percentage point increase in the probability that the locality receives a borehole. This pattern is confirmed when we interact *Match Proportion* with the two segregation dummies (Models 4-6). The interaction between *Match Proportion* and the continuous measure of segregation is also statistically significant and in the expected direction (Model 7). As above, all results are robust to the inclusion of time-varying controls and time period dummy interactions with a range of locality characteristics.

In sum, we find strong evidence that the prevalence and degree of ethnic favoritism in electoral districts is increasing with ethnic segregation.²⁴ Coupled with our electoral district-level results, there is substantial empirical support for our theoretical framework: Segregation shapes both MP investment in local public goods and ethnic favoritism with respect to their geographic allocation.²⁵

Alternative Explanations

While the empirical patterns reported above are consistent with our theory, this section discusses and empirically assesses a number of alternative explanations.

Local Ethnic Homogeneity and Collective Action

One alternative centers on the expectation that homogeneous localities are better able to collectively mobilize to locally produce public goods

(Habyarimana et al., 2009; Miguel & Gugerty, 2005). If local public goods are locally produced at a higher rate in homogeneous localities and segregated electoral districts in general have more homogeneous localities than integrated ones, then segregated electoral districts could mechanically have more public goods. This explanation is, however, inconsistent with our locality-level results (Figure 3 and Table 2), which show that ethnically matched localities are the primary beneficiaries of local public goods in segregated electoral districts. If locality ethnic homogeneity alone were driving our results, we would not expect the effect of segregation to be conditional on ethnic match with an MP.

Collective action capacity could also interact with a supply-side mechanism to produce our locality-level results. For example, MPs may be more responsive to bottom-up pressures from coethnic communities than from noncoethnic communities. While we agree that the ability of communities to pressure coethnic leaders is important, this alternative explanation cannot explain why we find weak evidence of ethnic favoritism in less segregated electoral districts, where relatively homogeneous localities that are coethnic with the MP do exist. It could, however, be that segregation facilitates collective action to demand local public goods across localities, and so part of the reason segregation is influential is because of a demand-side mechanism. Although we cannot completely rule this out, we believe this channel is likely to be less important than the supply-side mechanism our theory highlights, as homogeneous coethnic localities in less segregated electoral districts should also be able to demand local public goods from the MP.

MP Quality

Another alternative explanation is that there is a correlation between segregation and the quality of the MP, producing a spurious relationship between segregation and local public goods provision. To rule out this explanation, we carry out a placebo test that examines whether segregation also affects the provision of *private goods* in the form of agricultural subsidies. Like local public goods, agricultural subsidies are highly valued by Malawian residents (Harrigan, 2008) and political elites exert discretion over their distribution (Chasukwa et al., 2014; Øygard et al., 2003; Tambulasi, 2009). But, unlike local public goods, they can be politically targeted to specific individuals or households, meaning that segregation should be less consequential for their strategic provision. In the SI, we show that the provision of these goods is not affected by segregation (Table SI.19).²⁶

Residential Sorting

If Malawians move in response to the provision of local public goods, then our ability to detect the effect of ethnic demography on their provision could be threatened. However, we anticipate that such residential sorting would lead to more diverse populations, and thus more integration, near local public goods, as migrants move toward better served areas—the opposite of what we observe. Furthermore, rural–rural migration in Malawi is relatively constrained due to the scarcity of land and customary rules governing land tenure (Chirwa, 2008; Kishindo, 2004).²⁷ What rural–rural migration does exist is unlikely to shift the ethnic landscape because both marriage and accessing communally held land typically occur within ethnic communities.²⁸ Rural–rural migration across ethnic communities is typically limited to laborers on large tobacco or tea estates (Potts, 2006), areas which are likely to have more, not less, local public goods provision. Taken together, these patterns of migration suggest that residential sorting is unlikely to account for our results.

Plurality Group Favoritism

Finally, we interpret our results as evidence of in-group favoritism. It is possible, however, that MPs are instead targeting benefits to the largest ethnic group in an electoral district, whether it is their own group or not, to maximize their electoral coalition. With few districts in which the MP is not a member of the ethnic plurality, we cannot distinguish plurality group favoritism from coethnic favoritism. We note, however, that the interpretation we have offered is plausible in light of the existing evidence that politicians in much of Africa have incentives to favor their own ethnic group. Furthermore, this alternative interpretation does not undermine our general argument: Regardless of the group that the political elite is seeking to favor, our logic suggests that the segregation of that group shapes how it is favored.

Conclusion

This article advances a theory about how ethnic segregation shapes elite strategies for engaging in ethnic favoritism. We show that more boreholes—an important local public good in the Malawian context—are allocated to electoral districts where ethnic groups are spatially segregated and that ethnic favoritism in borehole provision is more common in segregated contexts. These patterns are consistent with our claim that ethnic segregation conditions how elites invest in and allocate local public goods.

Our theory and results make several contributions to the study of ethnic politics in Africa and distributive politics more broadly. First, they underscore the importance of ethnic segregation in understanding distributive politics in diverse contexts. In particular, our within-country research design and high quality data on ethnic group distributions provide compelling evidence that segregation indeed affects ethnic favoritism, despite mixed results from studies evaluating this relationship cross-nationally (De Luca et al., 2015; Franck & Rainer, 2012).

Our framework also helps make sense of outstanding puzzles in the literature on ethnic politics in Africa. For example, while ethnic favoritism is pervasive in some contexts, it is not universal (Franck & Rainer, 2012). Nor is there ethnic favoritism in the allocation of all distributive goods in a given context (Kramon & Posner, 2013). Our theory contributes by specifying the conditions under which ethnic favoritism should manifest in local public goods provision, as the geographic reach of different types of goods will define the scale at which ethnic composition matters. Our theory also has implications for the question of why local ethnic diversity is often associated with low public goods provision. While past explanations focus on local collective action (Alesina et al., 1999; Habyarimana et al., 2009; Miguel & Gugerty, 2005), our framework suggests that political leaders underinvest in public goods in highly diverse local areas because such goods are too difficult to target to their coethnic supporters. Thus, distributive politics may help to account for the underprovision of public goods in ethnically diverse areas.

Our study also contributes to recent work on ethnic geography and vote choice. While we do not observe vote choice in Malawi, our theory implicitly generates expectations about the relationship between ethnic segregation and ethnic-based voting. Past research has found that the geographic concentration of ethnic groups is positively associated with ethnic bloc voting and the existence of ethnic parties (Alesina & Zhuravskaya, 2011; Ishiyama, 2012; Velasquez, 2013) theory suggests that geographically segregated groups will tend to vote ethnically because they anticipate that local public goods will be targeted to their area. Consistent with this expectation, Nathan (2016) finds that variation in ethnic segregation across urban neighborhoods in Ghana predicts ethnic voting, which he attributes to the (unobserved and untested) expectation that politicians provide different types of goods to localities with different ethnic geographies. In rural Ghana, Ichino and Nathan (2013) find that citizens who make up a local ethnic minority are willing to vote for a noncoethnic presidential candidate, and argue that this is because they expect to benefit from the local public goods targeted toward the ethnic majority. Our study is consistent with such voter expectations but also implies that local ethnic minorities should be most likely to vote across ethnic lines in contexts of high ethnic segregation. Future

research should directly assess the relationship between segregation and vote choice, as well as evaluate the electoral returns to strategically targeting local public goods provision.

Finally, while we test the theory in Malawi, we expect the argument to generalize to other contexts for two reasons. First, Malawi is similar to many other countries in that political elites have incentives to favor some groups over others. Research on distributive politics shows this to be the case in a range of socioeconomic and institutional contexts: in Australia, a wealthy democracy with single-member districts (Denemark, 2000); in Sweden, a wealthy democracy with proportional representation (Dahlberg & Johansson, 2002); in India, a developing democracy with single-member districts (Min, 2015); in Benin, a developing democracy with proportional representation (Kramon & Posner, 2013); and in Egypt, an electoral authoritarian regime (Blaydes, 2010). Second, because our theory emphasizes the importance of segregation in shaping the type of goods used to favor one group over others, the theory can be applied to the study of favoritism in contexts where elites have discretion over different types of goods (private and public). In urban Ghana, for example, Nathan (2016) finds that voters expect elites to distribute different types of goods to neighborhoods with different ethnic demographics, which is consistent with our framework. Research from Latin America documents that governments often invest in a different mix of public and private goods in different local political contexts (Albertus, 2012; Magaloni, Diaz-Cayeros, & Estévez, 2007), patterns that our logic may help to explain. Thus, while more research is required, we anticipate that segregation may shape distributive politics in contexts with different institutional configurations, degrees of urbanization, and levels of economic development. In short, our central finding—that ethnic segregation conditions the strategies that incumbents use to favor their coethnics—has implications for the study of distributive politics beyond Malawi, and beyond sub-Saharan Africa. Wherever political elites have incentives to favor certain groups of voters over others, the spatial distribution of these groups is likely to shape the distributive strategies they adopt.

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Supplemental Material

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Notes

1. While Franck and Rainer (2012) find no evidence that ethnic favoritism by heads of state is more pronounced in segregated countries in Africa, De Luca, Hodler, Raschky, and Valsecchi (2015) find that it is both within Africa and across regions. Our approach offers several advantages compared with these two existing studies. First, both studies only consider shared ethnicity with the head of state and are thus forced to leverage cross-country variation in segregation. In contrast, our within-country design ensures greater homogeneity across units in the study: Each member of parliament (MP) in Malawi faces a relatively comparable strategic environment, including the same historical context, electoral system, party system, and institutional framework for local public goods distribution. Thus, our analysis allows us to control for potentially important but hard to measure variables that could confound cross-national analysis. Second, our fine-grained, census-based measure of ethnic segregation in Malawi is more appropriate than existing cross-national measures of ethnic segregation. For example, Franck and Rainer's (2012) segregation measure is based on the geographic mapping of language groups that assumes clearly defined boundaries with no overlap (see Matuszeski & Schneider, 2006), and thus, by design, cannot capture ethnic integration at the local level, an important source of variation in our own data. Similarly, the measure of segregation used by De Luca et al. (2015), from Alesina and Zhuravskaya (2011), relies on data that significantly underestimates subnational diversity (see Gershman & Rivera, 2016). Our measure of ethnic segregation, which uses census data on the ethnic make-up of more than 12,000 localities, and our subnational analyses focused on electoral districts within Malawi, offers a higher quality and more rigorous test of the relationship between segregation and ethnic favoritism.
2. "Local public goods" are *locally* nonrivalrous and nonexcludable but costly to access from distant locations.
3. "Efficiency" refers to electoral returns received (the output) for a given input of time and resources.
4. Chewa are the largest group (33%), followed by the Lomwe (18%), Yao (14%), Ngoni (12%), Tumbuka (9%), and seven smaller groups (Government of Malawi,

- 2008). There is significant variation in segregation across Malawi (Figures SI.1 and SI.6 of Supporting Information [SI]).
5. The 2009 respite from ethnopolitical voting is typically attributed to the precarious position of the president, Bingu wa Mutharika, after defecting from the ruling United Democratic Front (UDF) and establishing his own party, which forced him to extend state-based patronage to areas beyond the UDF-dominated Southern Region (Ferree & Horowitz, 2010).
 6. According to data gathered in 2000 (National Statistical Office of Malawi & ORC Macro, 2001), about 40% of the rural population had access to a borehole, while another 40% did not have access to a clean water source. These people rely on unprotected wells and surface water (e.g., lakes or streams). Twelve percent had access to a community stand pipe, and only about 2% had access to piped water.
 7. Electoral districts are nested within 28 administrative districts.
 8. Because the vast majority of localities (84%) received either one borehole or no new borehole, we use a dichotomous indicator of receiving at least one new borehole.
 9. For each locality in the 2008 census, we know the total population and the proportion of the population belonging to each ethnic group. While it would be ideal to measure ethnicity prior to 1998, the 1998 census did not ask about ethnicity. We discuss the possibility of residential sorting in the “Alternative Explanations” section.
 10. If the ethnicity of the MP changed between the legislative terms, we average across the proportions for each term.
 11. In particular, our input is the proportion of each locality’s population that belongs to each of the following 12 ethnic groups: Chewa, Lambya, Lomwe, Ngonde, Ngoni, Nyakusa, Nyanja, Sena, Senga, Tonga, Tumbuka, and Yao.
 12. This MP-specific measure of segregation is more relevant to our theory than a weighted measure of segregation aggregated across all groups. In practice, the two measures are highly correlated ($r = .97$).
 13. Results are robust to including all electoral districts (see SI 0.6).
 14. The proportion of the 1,315 localities in low segregation districts that are ethnically matched with their MP is 0.47. The same proportion is 0.50 for the 1,542 localities in moderately segregated districts and 0.32 for the 645 highly segregated districts.
 15. This approach allows us to relax the assumption that the conditional variance and mean are equal, and guards against understating the standard errors.
 16. The spatial location of urban areas in Malawi is captured using the Global Rural-Urban Mapping Project (GRUMP) data (Balk et al., 2006; GRUMP, 2011). GRUMP defines the extent of urban areas based on population, nightlight data, and settlement points, and we calculated the proportion of each electoral district that is urban based on GRUMP’s mapping.
 17. MPs serve on the development committees for administrative districts and exercise the significant influence over the allocation of development projects through that body (Chinsinga, 2008; Chiweza, 2010; O’Neil et al., 2014).
 18. Throughout, we generate expected values and confidence intervals based on 10,000 simulations that approximate the sampling distribution of the parameters

- in the model (Gelman & Hill, 2006; King, Tomz, & Wittenberg, 2000, Chapter 7).
19. For differential demand to account for the difference-in-difference (DiD) results, newly matched localities would have to experience greater increases in demand for water than localities who remained unmatched *and* this differential increase in demand would have to occur only in segregated electoral districts, which seems unlikely.
 20. With two time periods, the latter is simply an indicator for the second time period.
 21. We show in the SI that the results are robust to a logistic specification (Figure SI.8). Our main analysis clusters standard errors on locality because this is the level at which “ethnic match” is assigned. This approach is similar to Franck and Rainer (2012), who cluster on ethnic group-survey round, and Burgess et al. (2015), who cluster on district, the levels at which ethnic match is assigned in their respective studies. However, in Table SI.11 of the SI, we show results using a more conservative approach to clustering—at the electoral district-year level—and the results are, in most cases, robust.
 22. We include interactions with an indicator of urban/rural, population density, ethnic diversity, land area, distance to Lilongwe and Blantyre, and number of boreholes per capita in 1998. The complete results are presented in Table SI.4 in the SI.
 23. We present a range of robustness tests of these results in the SI, including alternative segregation cutpoints (Figure SI.9) and a parametric test of how ethnic favoritism varies as a continuous function of segregation (Figure SI.8). The SI also shows that the DiD results are largely stable with the removal of urban electoral districts from the sample (Table SI.8).
 24. Because the DiD analysis focuses on the set of localities that experienced a change in the *Match* variable from 1998 to 2008, we conduct an additional set of cross-sectional analyses that examine ethnic favoritism in the full set of localities (Table SI.12). While we prefer the DiD analysis, which controls for time-invariant differences in localities’ probability of receiving a borehole and for common time shocks across localities (at least for a given level of segregation), the cross-sectional results are less precise but also consistent with the argument that segregation conditions ethnic favoritism across a large number of localities.
 25. We also examine whether our conclusions extend to two other public goods: health clinics and schools. The results are presented in Tables SI.13 to SI.18. The results are more mixed and generally weaker than the borehole results. This is likely due to the fact that MPs have less discretion over the provision and allocation of clinics and schools, which are constructed at far lower rates (e.g., less than 2% of localities received a new clinic between 1998 and 2008) and may be more heavily influenced by political decisions at the national level. Consistent with this interpretation, Kramon and Posner (2013) find evidence that coethnicity with the president in Malawi is associated with greater education and health outcomes but find no evidence that Malawian presidents favor their coethnics with clean water access. For MPs, the scope conditions of our theory are better met by the types of investment that MPs regularly make in these sectors, which

- fall short of providing an entirely new school or clinic. For example, MPs are likely to strategically target the provision of school toilets or beds for a clinic, but we are unable to observe these types of investments with census data.
26. In addition, while we find evidence of ethnic favoritism in the distribution of these goods, the degree of ethnic favoritism is greatest in the most integrated electoral districts and decreasing with segregation (Table SI.20). This finding is at odds with recent research showing no evidence of ethnic favoritism in the distribution of agricultural subsidies within Malawi (Dionne & Horowitz, 2016). However, the reported null effect was for *presidential* coethnics, suggesting that MP coethnicity is more important for favoritism in the provision of private goods than presidential coethnicity. This second finding allays a separate potential concern: that some residents are better able to get a coethnic leader elected *and* be more effective in lobbying for public resources.
 27. Census data show that only 10% of rural Malawians reside outside their district of birth. This figure is based on individual-level information about districts of birth and residence for a random 10% sample ($n = 1,282,335$) of the 2008 census data (Minnesota Population Center, 2014).
 28. Customary and cultural barriers limit access to land outside one's ethnic community (Potts, 2006), and most marriages are formed within 5 miles of one's home village (reported in Englund, 2002).

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