

Prizewinning Dissertation 2018

No.18-KL

Decentralisation: Road to Development or
Bridge to Nowhere? Estimating the Effect of
Devolution on Infrastructure Spending in Kenya

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Published: February 2019

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MSc in Development Management 2018

Dissertation submitted in partial fulfilment of the requirements of the degree

Decentralisation: Road to Development or Bridge to Nowhere?

Estimating the Effect of Devolution on Infrastructure Spending in

Kenya

Word Count: 10,081

Abstract

Does the decentralisation of state institutions result in a more equitable distribution of public goods in the African context? To answer this question this study examines a natural experiment in Kenya where the new 2010 Constitution devolved political and fiscal powers to 47 newly-established county governments. A difference-in-differences strategy is employed that exploits heterogeneity in the ethnic alignment of each county to the president. This effectively varies the intensity of the ‘treatment’ of devolution across counties. Using data on road expenditure across all 47 counties from 2010 to 2017, this study finds that the devolution of state structures in Kenya resulted in a significantly more equitable distribution of road spending. These results represent an important contrast to the prevailing view in the literature that asserts that decentralisation reforms in sub-Saharan Africa have largely failed to live up to expectations.

Acronyms

CoB	Office of the Controller of the Budget
GoK	Government of Kenya
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KRB	Kenya Roads Board
KURA	Kenya Urban Roads Authority
LDC	Late Developing Countries
MTEF	Medium Term Expenditure Framework
PNU	Party of National Unity
SSA	Sub-Saharan Africa
TNA	The National Alliance

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1. Introduction

Does the decentralisation of political and fiscal institutions result in a more equitable distribution of public goods in the sub-Saharan African (SSA) context? Over the preceding few decades decentralisation reforms have increasingly been recommended by policy analysts and donor agencies and, in turn, adopted by policymakers in late developing countries (LDCs) as a way of 'bringing government closer to the people' (World Bank, 1999; Faguet, 2012). The theory underlying this trend asserts that more devolved political and fiscal power increases government accountability and responsiveness resulting in more effective public service delivery. Such enhanced levels of accountability and responsiveness in a decentralised system are posited to be brought about because subnational politicians have more accurate information about local needs and, relatedly, local citizens possess more intimate knowledge about the performance of subnational politicians (Oates, 2005; Ostrom et al., 1993; World Bank, 1994).

In addition to improving public service delivery, decentralisation advocates also stress that devolved state structures can help reduce inter-group conflict in multi-ethnic societies (Roeder, 2010). This is because centralised states in LDCs are often dominated by the majority ethnic group who, in control of a powerful executive branch, systematically target state resources to their co-ethnics in exchange for electoral support, all but ignoring non-aligned, minority ethnic groups (Bates, 1989; Franck & Rainer, 2012; Hodler & Raschky, 2014). It follows that by extending subnational autonomy to these non-aligned groups – historically excluded by a strong, centralised state – proponents avow that decentralisation can augment the size of the national pie that such minorities receive and thereby decrease the potential for lingering ethnic cleavages to erupt into outright violence (World Bank, 2004; van de Walle, 2001). This claim is especially important in the African context due to the salience of ethnicity in politics throughout the sub-continent as well as the ubiquity of centralised states with 'big man' presidents in the post-independence era (Horowitz, 1985; Hassan, forthcoming).

The study of decentralisation is motivated by overriding concerns of democratic accountability, political responsiveness, and equity in the distribution of public goods. Moreover, a further motivation from an academic perspective is that, despite most LDCs (and almost every African country) embarking on some type of decentralisation reforms since the early 1990s (Brosio, 2000; Manor, 1999), the literature is still largely ambiguous as to its ultimate effects.

In this study I examine the effect of devolution in Kenya on public goods provision. Specifically, in 2010 Kenya passed a new Constitution that decentralised broad fiscal and political

functions to 47 newly created (and popularly elected) subnational county governments at a discrete period in time (March, 2013). These constitutional changes to Kenya's state structure create a natural experiment. I use a difference-in-differences method to estimate the effect of devolution on road spending. I exploit heterogeneity in the ethnic alignment of each county to the president that, in effect, varies the intensity of the 'treatment' of devolution. The panel data constructed for this study includes data on total road spending for every county for each fiscal year from 2010/11 to 2016/17 for a total of 287 observations.

Reviews of decentralisation on the sub-continent broadly characterise decentralisation reforms in SSA as not having lived up to expectations (Hassan, forthcoming), with particular epithets being used to label the specific breed of African decentralisation: 'reluctant decentralisation' (Hassan, forthcoming), 'centralised federalism' (Dickovick, 2014), 'fragile, unstable, or failed federalism' (Erk, 2014), and 'recentralisation' (Suberu, 2009). Contrary to this prevailing pessimism about the effectiveness of decentralisation reforms in the African context, I find that devolution has resulted in a significantly more equitable distribution of road spending in Kenya. This finding takes on increased importance when one considers that road spending made up about one-fifth of the total development budget in Kenya in 2016/17 (Kinuthia, 2018).

This study's main contribution is that, to my knowledge, it is the first that attempts to quantify the effect of Kenyan devolution on the distribution of public resources using all 47 counties. In addition, methodologically, this study's quasi-experimental design combined with the several robustness checks conducted goes beyond most research on decentralisation in SSA, which typically relies on analytic narratives or before-and-after regressions. Furthermore, the study's focus on one country – Kenya – implies that the methodological issues that typically accompany cross-country studies on decentralisation (e.g., external shocks, different legal and institutional frameworks, low data comparability, etc) do not impede on the findings presented here. Finally, in light of the findings that Kenya's decentralised state institutions have significantly increased the equitable distribution of a specific public good (one of the main objectives of the 2010 Constitution), this study suggests that perhaps the literature's prevailing characterisation of African decentralisation reforms as inconsequential (at best) or failed (at worst) requires re-examination.

In this sense, this study contributes to the broader literature that examines the effect of institutions on African development more generally and the provision of public goods in particular. Specifically, it brings together two strands of social science research. The first strand is typified by empirical studies in economics and political science that focus on the weakness of institutional checks on political elites and the state as a key driver of underdevelopment (see Acemoglu et al.,

2001; Acemoglu et al., 2014; Bates, 1981). The second strand is exemplified by historiographies of the sub-continent that emphasise the importance of deep-seated, ethnic institutional traits as a main factor in SSA's poor development outcomes (see Bayart, 1993; Young, 1994; Horowitz, 1985; Herbst, 2000). Ultimately, the way in which highly salient ethnic politics interacts with changes in the institutional design of state structures (i.e., the transition from centralised to decentralised governance) to affect the distribution of public goods is poorly understood.¹

This paper is structured as follows: Section 2 overviews the relevant literature. Section 3 describes the data utilized and methodology employed. Section 4 presents the results of the empirical analysis. Section 5 elucidates some limitations of the study as well as avenues for future research. Section 6 concludes.

2. Literature Review

2.1 Decentralisation

The overwhelming trend of political history over the course of millennia has been the continued centralisation of states (Faguet, 2012). However, recent decades have seen a dramatic reversal of this trend. Since the mid-1980s over 80 percent of LDC governments have begun to experiment with different types of decentralised state structures (Manor, 1999). Indeed, this new trend towards decentralisation has been enthusiastically supported by multilaterals, who have increasingly recommended that LDCs decentralise governance to more local levels (World Bank, 1999; World Bank, 1994). The main motivation behind such a stark reversal is that devolved systems of government will enhance accountability and responsiveness to local needs (Ndegwa, 2002; Seabright, 1996).

As the term 'decentralisation' encompasses a wide-ranging set of institutional forms, it is useful to establish concrete definitions before proceeding. Table 1 broadly defines the three main forms of 'decentralisation': (i) *deconcentration*, (ii) *delegation*, and (iii) *devolution*. This study concerns itself with the strongest form of decentralisation: devolution.

Beyond the broader concerns of government accountability and responsiveness, there are two main rationales in the African context that are most cited by the literature for decentralising state structures. Firstly, decentralisation deepens democracy by fostering 'buy-in' among voters. 'Buy in' for democracy is bolstered because, when contrasted with a winner-take-all, centralised

¹ See Posner (2012) and Burgess et al. (2015) for exceptions.

system, devolved states at least allow the particular group that suffers national-level electoral defeat to maintain some subnational powers and autonomy (Hassan, forthcoming). This defeated group

Table 1: Defining the Forms of Decentralisation

Form	Description
Deconcentration (<i>weakest</i>)	Involves redistributing decision-making authority and financial/management responsibilities among different levels of the central government (e.g., shifting responsibilities from the capital to frontline providers in regions, provinces, or districts).
Delegation	Involves a central government transferring responsibility for decision-making and administration of public functions to semi-autonomous public sector agencies not wholly controlled by the central government, but ultimately accountable to it. These agencies usually have separate legal status and have a great deal of discretion and autonomy.
Devolution (<i>strongest</i>)	Involves the central government devolving functions to subnational governments. Subnational governments have clear and legally recognized geographical boundaries over which they exercise authority and within which they perform these functions.
<i>Source:</i> Adapted from definitions used by the World Bank and the World Health Organization (WHO) (see http://www1.worldbank.org/publicsector/decentralization/admin.htm ; http://www.who.int/health-laws/topics/governance-decentralisation/en/)	

also has an incentive to govern well in its subnational ‘homeland’ so as to demonstrate its ability to take over national-level power in the next election (Riedl & Dickovick, 2013). Thus, both winners and losers have some stake in the perpetuation of devolved, democratic institutions. On top of this, a decentralised system can further democratisation because subnational units can effectively serve to constrain the power of the president (Falleti, 2010; Cheeseman et al., 2016). This is especially pertinent in the African context with its history of ‘big man’ presidents that have typically dominated centralised, unitary states in the post-independence era (Erdmann & Engel, 2007).

Secondly, decentralisation, in the context of multi-ethnic populations, can bolster the political representation and voice of minority groups, and, in turn, reduce the likelihood of inter-group conflict relative to more centralised systems (World Bank, 2004; van de Walle, 2001; Scherrer, 2008). For example, Tiebout (1956) notes how citizens in diverse societies can ‘vote with their feet’ by moving to subnational jurisdictions that align with their policy preferences. The accommodation of the diverse preferences of all groups brought about by the extension of subnational autonomy can help mitigate ethnic violence. This has been a key motivation for some

of SSA's largest and most ethnically varied countries to embark on decentralisation reforms, including Nigeria, Sudan, South Africa, and Ethiopia (Suberu, 2009; Brancati, 2009).

Overall, the extent to which African decentralisation reforms have been successful in addressing these two persistent problems – (i) incomplete democratisation since the advent of the 'Third Wave' in the 1990s (Huntington, 1991), and (ii) high levels of ethnic conflict throughout SSA – is highly contested in the literature (see Dickovick, 2014; Erk, 2014; Suberu, 2009; Hassan, forthcoming). Indeed, while there are quite literally thousands of studies – both academic and policy literature – that attempt to make sense of the effects of decentralisation, the vast majority consist of analytic narratives, broad surveys, or simple before-and-after regressions that leave the sub-field of decentralisation studies largely ambiguous and unable to establish firm conclusions (Treisman, 2007).² Filling this gap in the literature is a key motivating factor of this study. Unlike much of the literature, I use a quasi-experimental design in an attempt to more precisely estimate the causal effects of decentralisation reforms on the sub-continent.

2.2 Ethnic Politics in Kenya

2.2.1 Colonial District Boundaries and the Formalisation of Ethnicity

The empirical strategy of the study (see Section 3.2) relies, in part, on the initial conditions of the subnational counties being exogenously determined (i.e., the product of historical accident). Indeed, both ethnographies and the historical record attest that prior to colonisation many of Kenya's 42 ethnic groups were mobile and geographic boundaries were fluid. For example, in the Rift Valley, Waller (1993) notes that in the nineteenth century boundaries "between pastoralists, cultivators and hunters in the Rift Valley region were permeable, constantly shifting and subject to continuous redefinition.... With the establishment of colonial rule...boundaries hardened and became policed borders that divided rather than united communities on either side," (p. 226-27). In Kenya's Western region, Were (1967) states that in the two or three centuries preceding colonialism, "various factors – famine, epidemics, domestic disputes, the spirit of adventure and warfare – made the inhabitants of the region extremely mobile," (p. 41). In the Central highlands, Parsons (2012) records how "[i]n the pre-conquest era, highland peoples often assumed new identities through migration, commerce, enslavement, intermarriage, and adoption," (p. 69-70).

² For examples of decentralisation studies that use analytic narratives see Qian (2003), Careaga & Weingast (2003), and Rondinelli et al. (1983). For examples of studies that constitute 'broad surveys' see Manor (1999) and Smoke (2001). For an example that utilizes simple before-and-after regressions see Enikolopov & Zhuravskaya (2007).

The imposition of British colonial rule in 1895 put a halt to this fluidity. With the onset of colonisation, the distribution of ethnic groups across the country was “frozen by the Colonial Government by the demarcation of ‘African Land Units,’” (Morgan & Shaffer, 1966: p. 16). As was the norm in Britain’s African colonies, Kenya was to be administered via indirect rule (see Lugard, 1922). Indirect rule in Kenya involved the establishment of areas where white settlers could live (mainly in Kenya’s ‘White Highlands’), as well as the establishment of Native Reserves into which the local African population was forced. Native Authorities were also created, with locals loyal to the colonial regime (usually elites) appointed to administer different geographic regions as ‘chiefs’ (Mamdani, 1996). The borders of these Native Reserves were drawn largely along prevailing ethnic lines as perceived by the British, as the colonial administration thought ethnic homogeneity would maximise the African population’s submission to their local chief, chiefs who were responsible for administering tax collection and enforcing colonial labour schemes (Burbidge, 2018). Such ready submission would minimise the costs of colonial rule for the British. As Mamdani (1996) states, these imposed boundaries “enforc[ed] an ethnic identity on the subject population through ethnically organized Native Authorities,” (p. 136-37). Moreover, tribes that had once been mobile in Kenya now had their freedom of movement formally restricted by the colonial requirement to carry *kipande* certificates if traveling between different jurisdictions, which further entrenched ethnic homogeneity (Burbidge, 2018).

The boundaries of these colonial Native Reserves persisted: they were the basis of the 41 subnational districts created in 1963 at independence, and these districts were, in turn, used in the formation of the 47 counties established by the 2010 Constitution (Burbidge, 2018). At independence 38 of the 41 districts had ethnic groups that constituted over 50 percent of the district’s population (Burgess et al., 2015). Such subnational ethnic homogeneity has remained remarkably stable, with 40 of the 47 counties today possessing a single ethnic group that contains over 50 percent of the county population (see Appendix 3). In this way, these subnational jurisdictions can be used as identifiers of particular ethnic groups. Road spending for each fiscal year of the study period can, in effect, be assigned to a particular ethnicity based on the subnational location in which the road is built. Similarly, counties can be said to be aligned or non-aligned to the sitting president based on the majority-ethnicity within a particular county. Such ethnic alignment or non-alignment with the president effectively varies a given county’s exposure to the

‘treatment’ of devolution and can therefore allow me to determine whether devolution resulted in more equitable levels of roads spending (see Section 3.2).³

2.2.2 *Ethnic Politics in Kenya and the 2010 Constitution*

The presence of ethnic cleavages, exacerbated by the persistence of colonial borders, has combined with highly centralised political power in Kenya to give rise to ethnic politics. The salience of ethnicity in politics has been a widely studied phenomenon due to its pervasiveness in SSA’s emerging democracies. The literature extensively documents the reliance of politicians on their coethnics for a sustained base of electoral support (Posner, 2012); support that is then maintained through patron-client relationships that disproportionately provide coethnic voters with both public resources and/or personalized, private favours (Chabal & Daloz, 1999). Over time, these types of ethnically driven political exchanges create voter expectations and, in turn, political candidates seeking to secure the votes of coethnics must then increasingly resort to what Stokes et al. (2013) call ‘non-programmatic’ distributive politics to win elections.⁴ Several empirical studies have provided robust evidence of such ‘non-programmatic’ distributions of public (and private) resources towards coethnics across Africa generally (Franck & Rainer, 2012; Hodler & Raschky, 2014; Dickens, 2018), and in Kenya in particular (Burgess et al., 2015; Kramon & Posner, 2016; Marx et al., 2017).

Given the evidence that the provision of public goods in Kenya is at least partly determined by ethnic affiliation, and given Kenya’s centralised, winner-take-all state structure, it is unsurprising that elections tend to exacerbate ethnic tensions. Indeed, ethnic violence has broken out in several past elections under Kenya’s centralised system: 1992, 1997, and most egregiously in 2007/08. Finally, aiming to put an end to this ethnically driven election violence, Kenyan politicians initiated a constitutional reform process that culminated in a 2010 referendum. The new Constitution passed overwhelmingly, with two-thirds of Kenyan voters in favour. Embedded in this constitutional change was a sweeping devolution of political, fiscal, and administrative authority to 47 subnational county governments that would come into existence in March, 2013. These subnational governments would be transferred at least 15 percent of national revenues (GoK,

³ See Burgess et al. (2015) and Miguel & Gugerty (2005) for examples of other empirical work that exploits the imposition of Kenya’s colonial borders to examine public goods provision.

⁴ Stokes et al. (2013) define programmatic forms of public goods distribution as those that have formal and publicly available criteria for distribution, and where these criteria *actually* determine the distributions observed. Where there are no formal or publicly available criteria, distributions are said to be non-programmatic.

2010: Art. 203) via an *objective* formula.⁵ The county governments would then use these transfers to autonomously manage several key functions (GoK, 2010: Schedule 4).⁶ The vast majority of Kenyan citizens voted in favour of the new Constitution because they believed decentralisation would alleviate large disparities in public goods provision and, by so doing, lessen the risk of ethnic conflict in Kenya (Cheeseman et al., 2016).

2.3 Roads and Development

There is a large literature that highlights the importance of infrastructure in spurring development. Theoretically, Jones (2011) emphasizes the significance of intermediate goods – like transportation networks – in explaining the large income differences between rich and poor countries. Empirically, Atkin & Donaldson (2015) show that intra-national trade costs are 4 to 5 times higher in Nigeria and Ethiopia than in the US. These high transaction costs have negative implications for the ability of SSA firms to successfully integrate themselves into global markets, as well as for remote SSA consumers whose welfare, Atkin and Donaldson show, is hardest hit by such high trade costs. It follows then that poor roads increase the costs associated with trading goods across lengthy distances, and that lowering these transport costs could not only improve the competitiveness of SSA firms but could also help spread the gains from trade to remote SSA consumers and thus alleviate regional inequalities – a key source of ethnic conflict (Donaldson et al., 2017).

In addition to these relatively shorter-term gains from improved infrastructure, a new line of inquiry is examining the long run effects of early road networks on economic development today. Exploiting a natural experiment in the distribution of road networks throughout the Roman Empire, Dalgaard et al. (2018) find that increased road density in Roman times is associated with (i) increased contemporary road density, (ii) increased settlement formation, and (iii) increased economic prosperity today.

Thus, the above literature attests to the importance of roads for both short- and long-run economic development. In addition to these factors, roads were selected as the focus of this study for several other reasons. First, roads are the largest item in Kenya's total development budget

⁵ The current objective formula is set out by the Commission on Revenue Allocation and includes 6 parameters each with different weights: (i) population (45 percent); (ii) equalisation share (26 percent); (iii) poverty (18 percent); (iv) land area (8 percent); (v) fiscal responsibility (2 percent); and (vi) development factor (1 percent). See <https://www.crakenya.org/information/revenue-allocation-formula/>.

⁶ Devolved functions are enumerated in Schedule 4 of the 2010 Constitution. They include health services, agriculture, land administration, water and sanitation, infrastructure, and several others.

(Kinuthia, 2018). Second, before the provision and maintenance of all class D roads (and below) were transferred to county governments after March, 2013,⁷ road spending was highly centralised in the Office of the President (Burgess et al., 2015: p. 1826). Third, roads are highly visible development projects and thus theory posits that road building would be prioritised by the new county governments in order to quickly demonstrate to local voters the value of devolved government.⁸ Fourth, Afrobarometer surveys in Kenya suggest improved infrastructure is listed by citizens as one of the most prioritised devolved public goods (see Appendix 4).

3. Methods and Data

3.1 Variables and Data

The empirical analysis builds off of the study by Burgess et al. (2015), who construct a district-year panel on road expenditure in Kenya for each fiscal year from independence in 1963 to 2011. This paper has a similar aim to Burgess et al. (2015): the authors first estimate whether the ethnicity of the president impacts the level of road spending that he directs towards coethnic areas, then, once this is established, they examine whether ethnic favouritism in road spending is relatively higher during autocratic periods than during democratic periods. Thus, they pinpoint how changes in Kenya's state structure (autocracy versus democracy) affect public goods provision through altering the extent of ethnic favouritism. Indeed, the authors provide robust empirical evidence that democracy quells ethnic patronage. Similarly, this paper extends the analysis beyond Burgess et al.'s panel (which ends in 2011), to the post-2010 period during which Kenya passed the 2010 Constitution that fundamentally altered Kenya's state structure from a centralised, 'imperial' system dominated by the president, to a devolved system of government implemented in 2013. In this sense, as in Burgess et al. (2015), I also seek to pinpoint how changes in state structure (centralised versus decentralised) affect public goods provision.

To this end, I construct a county-year panel on road spending in Kenya for each fiscal year from 2010/11 to 2016/17. Post-devolution (following the March, 2013 elections), some roads functions were devolved to the newly created 47 county governments, and some roads functions

⁷ The Transition Authority (2015) as well as key informant interviews confirm that class A, B, C, and S roads are under the authority of the national government, and class D roads (and down) fall under the purview of the county governments. See Transition Authority (2015), p. 29-30, for further clarification on national versus county road classifications.

⁸ See Harding (2015) for a more detailed discussion of roads as a highly visible public good that can be readily attributed to specific branches of government in the African context.

remained under the jurisdiction of the national government (see footnote 7). Therefore, both national- and county-level road spending are required for the post-devolution period. As in Burgess et al. (2015), national-level road spending data is obtained from the *Development Estimates* (a government report published yearly that contains budget information for all national government ministries and agencies),⁹ and from the Medium Term Expenditure Framework (MTEF) Budget Reports published for the infrastructure sector by the National Treasury. The MTEF reports publish spending data on *all* individual road projects for *each* fiscal year, providing the project's name, the main locations that the road project runs through, and the cost (e.g., “Nakuru – Nyabururu – Nyeri road”). When individual road projects span more than one county, Google Maps was used to ascertain the total length of the road and then to calculate how many kilometres belong to each particular county.¹⁰

County government road expenditure data is obtained from the Office of the Controller of the Budget (CoB), which has published an *Annual County Governments Budget Implementation Review Report* every fiscal year since the creation of the 47 counties in 2013. The county-level road spending data is then combined with the national-level road spending data to get total road spending in each county in every fiscal year from 2010/11 to 2016/17. I converted both the national and county road spending data in my county-year panel so that it conforms to the 1963 district boundaries used by Burgess et al. (2015). There were 41 districts in 1963.¹¹ As a result, the empirical analysis is based on a dataset of 47 counties (converted to 41 districts) over a period of 7 fiscal years for 287 total observations.

Following Burgess et al. (2015), I then normalize the share of all Kenyan road spending received by a particular county relative to that county's population share. That is, the share of all Kenyan road spending that a particular county c receives (in a particular fiscal year) is divided by

⁹ While the *Development Estimates* were available for most fiscal years in the government publications section of the LSE Library, some fiscal years were missing. In such cases, the missing *Development Estimates* were ascertained at the National Archives at Kew.

¹⁰ Thus, when traversing multiple counties, road spending share is weighted by distance. I assumed spending is distributed equally across the entire road segment, as in Burgess et al. (2015). If a road project name does not provide sufficient information to ascertain its location(s), then I find the location through searches of reports and websites of Kenyan state agencies involved in road construction: (i) the Kenya National Highways Authority (KeNHA), (ii) the Kenya Roads Board (KRB), (iii) the Kenya Urban Roads Authority (KURA), and (iv) the Kenya Rural Roads Authority (KeRRA).

¹¹ This was done so that data on several control variables used by Burgess et al. (2015) could be merged into my dataset. A further motivation for aligning my dataset with Burgess et al.'s was so that placebo tests could be performed on the period preceding my study period. Placebo results are presented in Section 4.2.1. Where necessary the authors kindly clarified questions I had in constructing variables to ensure maximal coherence between the two datasets.

that county i 's population share (of the national population) in 2009. As Burgess et al. (2015) note, “[t]his statistic has a natural interpretation: a value 1 implies that a [county] received road spending that is exactly proportional to its population. Values greater than (less than) 1 denote spending that is above (below) the national per capita average,” (p. 1829). This measure of road expenditure is the outcome variable (denoted $road_{ct}$).

3.2 Empirical Strategy

An ideal experiment to estimate the effect of devolution on road spending would randomly assign some counties to the ‘treatment’ of devolution, and the resulting road spending in these ‘treatment’ counties would then be compared to a counterfactual group of counties in which road spending remained centralised. In reality, this counterfactual scenario cannot be observed, as devolution in Kenya was implemented across *all* 47 newly created counties following the 2013 elections.

To address this challenge to causal inference, I use a difference-in-differences specification that exploits the fact that ethnic heterogeneity across counties creates variation in the exposure of these counties to the ‘treatment’ of devolution. In particular, Kenyan counties vary in their ethnic alignment with the president.¹² Most scholars on ethnicity in Kenya commonly agree that the country is home to 42 different ethnic groups. Of these ethnic groups, 18 form the largest single ethnic group within particular counties (Weismann et al., 2016). If we take the presence of ethnic favouritism in Kenya (and the corollary of ethnically-driven voting behaviour) as given (see Burgess et al., 2015; Kramon & Posner, 2016; Marx et al., 2017; Wrong, 2009), it follows then that, pre-devolution, the spoils of a centralised, ‘imperial’ presidency are disproportionately targeted towards the ethnic group that is able to win the presidency (the Kikuyus since 2002). In contrast, post-devolution, such spoils in a decentralised state structure are now *diffused* among 47 counties that are headed by 18 different ethnic groups.¹³ Taking this line of reasoning to its logical

¹² The ethnicity of the president has remained constant throughout the entirety of the period from December 30th, 2002 to the present (both Mwai Kibaki and the current president, Uhuru Kenyatta, are ethnic Kikuyu). Thus, the logic goes that, pre-devolution, counties that are ethnically aligned to the president (Kikuyu-majority) receive a disproportionate level of road spending. There are seven such aligned counties (Kiambu, Kirinyaga, Laikipia, Muranga, Nakuru, Nyandarua, and Nyeri). On the other hand, counties that are ethnically non-aligned to the president (non-Kikuyu-majority) do *not* receive a representative level of road spending. There are 40 such non-aligned counties (as I use the 1963 district boundaries in my empirical analysis, which has 41 districts, there are then 7 aligned districts and 34 non-aligned districts).

¹³ See Appendix 3 for a list of all counties by ethnic composition. In an analysis of the ethnic composition of the 47 county governments (including both the 47 governors and 491 county executive committee members) Burbidge (2018) finds that the largest local ethnic group makes up, on average, 84 percent of the county

conclusion, one can posit then that the *one* aligned ethnic group (Kikuyus) – which prior to devolution had received a disproportionate share of the spoils of centralisation – will be comparatively *more* exposed to the ‘treatment’ of devolution than 18 different ethnic groups who must *share* amongst themselves the new-found spoils of devolution (i.e., the same ‘road spending pie’ is getting cut into many more pieces under devolution).

Therefore, the ‘treatment’ of devolution in non-aligned counties can be thought of as, in effect, a placebo. Due to a lower intensity of treatment, these non-aligned counties can then be used as a quasi-control group.

Several past studies use similar methodologies to the one described here, where authors have exploited heterogeneity in ethnic alignment to explain the distribution of public resources in the African context generally (Franck & Rainer, 2012; Hodler & Raschky, 2014; Dickens, 2018), and in Kenya in particular (Burgess et al., 2015; Kramon & Posner, 2016; Marx et al., 2017).

3.3 Identification Assumption: Parallel Trends

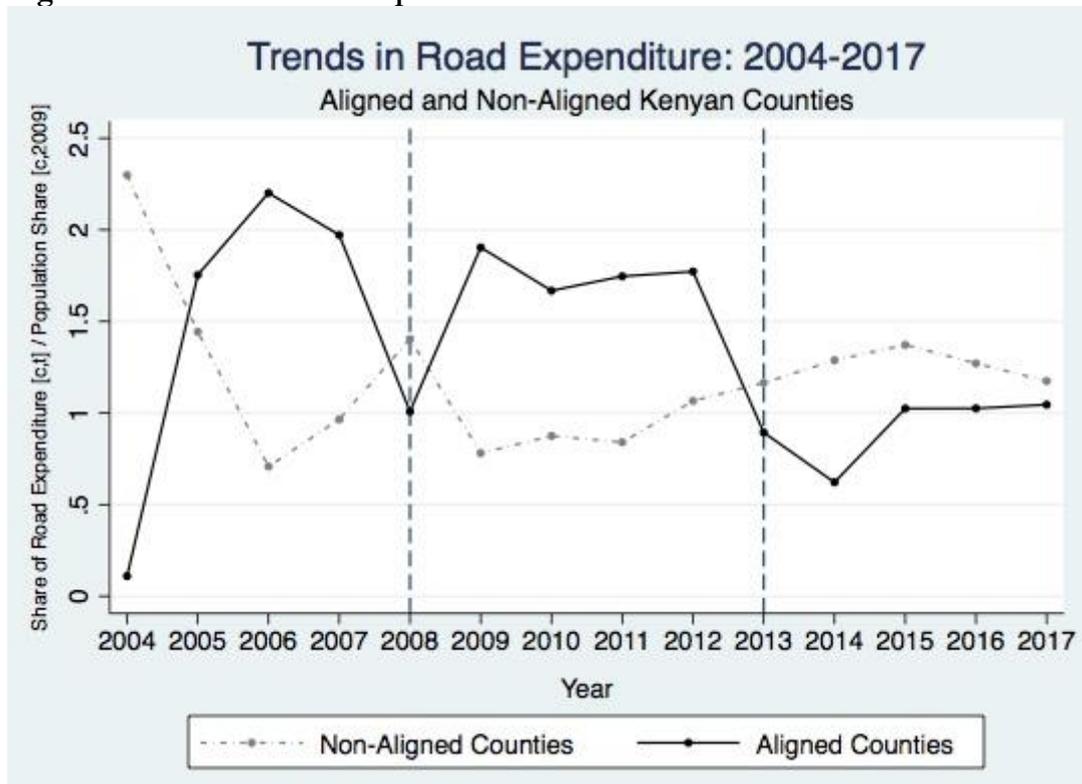
The key identifying assumption in this difference-in-differences design is that, in the absence of the ‘treatment’ of devolution, road spending trends would be the same in both the treatment (aligned) counties and the quasi-control (non-aligned) counties. That is, a deviation from a common (parallel) trend is brought about as a result of the treatment (Angrist & Pischke, 2009). Figure 1 graphs the averages of our measure of road expenditure ($road_{ct}$) for both ethnically aligned and non-aligned counties from 2004 to 2017. The two dashed vertical lines represent fiscal years during which presidential elections took place.

The trends in average $road_{ct}$ between aligned and non-aligned counties are quite striking. If we discount the first fiscal year (2003/04),¹⁴ all fiscal years before devolution (March, 2013) – excepting those fiscal years during which elections took place – saw Kikuyu-majority counties receiving *above* 1.5 times their proportional share of road spending. In contrast, road spending in non-aligned counties, pre-devolution, remained consistently below 1 (the proportional share). Following devolution, there is a precipitous drop in the share of road spending directed towards

political representation. Only 3 counties had county governors that did not align with the largest local ethnic group (Kajiado, Marsabit, and Nairobi). This broadly supports the high salience of ethnicity in Kenyan politics.
¹⁴ Daniel arap Moi (an ethnic Kalenjin) left the presidency on December 30th, 2002 (fiscal year 2002/03) after 24 years of rule during which he had systematically stocked the national government with coethnic Kalenjins (see Hassan, 2017; Hassan, 2016; Hassan, 2015). Given the ubiquity of Moi appointees throughout the national government, it is not surprising that there was a lag after Mwai Kibaki (an ethnic Kikuyu) took office for public resources to be re-directed from Kalenjin to Kikuyu areas.

aligned counties – remaining below or at 1 throughout the post-devolution period – *despite an ethnic Kikuyu continuing to hold the presidency*. Conversely, after the implementation of devolution, the share

Figure 1: Trends in Road Expenditure



Source: Author’s county-year panel from 2010/11 to 2016/17 is merged with Burgess et al.’s district-year panel (for fiscal years 2003/04 to 2009/10). The outcome variable (*Share of Road Expenditure [c,t] divided by the Population Share [c,2009]*) is averaged for both aligned (treatment) counties, and non-aligned (quasi-control) counties. Recall the intuition behind the outcome variable: “a value of 1 implies that a [county] receives road spending that is exactly proportional to its population. Values greater than (less than) 1 denote spending that is above (below) the national per capital average,” (Burgess et al., 2015: p. 1829).

of road spending received by non-aligned counties stays consistently above 1 – and above the share received by aligned counties – for the duration of the study period. The general pattern of interest to note is that pre-devolution the average $road_{ct}$ measure is inequitable and heavily skewed towards ethnically aligned counties, and post-devolution the share of road spending received by both aligned and non-aligned counties becomes much more equitable (closer to 1), with non-aligned counties registering a slight advantage. To the extent that Figure 1 satisfies the key identification assumption of parallel pre-treatment trends, the claim to causal inference is strengthened.

3.4 Estimation Approach

A difference-in-differences specification is used to estimate the effect of devolution on road spending, where the ethnic alignment of each county (to the president) represents the intensity of treatment across counties. The main estimating equation is expressed as follows:

$$road_{ct} = \alpha_c + \gamma_t + \delta(aligned_c \times devolution_t) + \theta(\mathbf{X}'_{c2009}) + e_{ct},$$

where the dependent variable, $road_{ct}$, is a measure of road expenditure for county c in year t as outlined above. The variable α_c represents county fixed effects, which controls for fixed differences between counties. Year fixed effects are denoted by γ_t and control for trends in road spending that are common to all counties. The interaction term interacts $aligned_c$ and $devolution_t$: $aligned_c$ (the proxy for intensity of treatment) is a binary variable equal to 1 if the population of county c is at least 50 percent ethnically aligned to the sitting president (Kikuyu), and 0 otherwise (see Appendix 3). The term $devolution_t$ is a binary variable equal to 1 for the period following the implementation of devolution (2014-2017).¹⁵ The coefficient on the interaction term, δ , is the coefficient of interest. It captures the difference between the effect of devolution in aligned counties and the effect of devolution in non-aligned counties. The \mathbf{X}'_{c2009} term denotes a vector of control variables for demographic, economic activity, and economic geography collected from the *Socio-Economic Atlas of Kenya* (Weismann et al., 2016). The inclusion of these variables controls for many factors that may be correlated with the main variable of interest (the interaction term) and also influence the outcome variable ($road_{ct}$). As this analysis uses panel data, all specifications use robust standard errors clustered at the county-level. See Appendix 1 for a full description of key variables and their sources.

4. Results

4.1 Regression Analysis

Table 2 reports the regression results with $road_{ct}$ as the dependent variable and the interaction term, $(aligned_c \times devolution_t)$, as the main explanatory variable. Several different specifications are reported beginning with a simple baseline specification (Column 1), followed by specifications that progressively add controls.¹⁶ Column 2 adds demographic controls including

¹⁵ Recall, devolution was implemented following the elections in March, 2013. Kenya's fiscal year runs from July 1st to June 30th. Therefore, as in Burgess et al. (2015), this study takes the notation that the road expenditure data provided in the *Development Estimates* and MTEF reports for year t gives spending for the time period July $t - 1$ to June t .

¹⁶ Note that the controls, where possible, were intentionally chosen to be similar to the controls used in Burgess et al. (2015) to maximise comparability between the results, and in turn heighten analytical insight (see Burgess et al. regression results on p. 1834 of their paper). While Burgess et al. (2015) used data from their

county population, area, and urbanization rate. Column 3 adds a control for economic activity (total formal sector employment in each county). Column 4 includes controls for economic geography: (i) whether a county is on the Mombasa-Nairobi-Kampala corridor, (ii) whether a county borders a foreign country, and (iii) a county's distance from Nairobi. As these controls are fixed over time (or are ascertained from a single base year, 2009), they would be purged from the model because of the model's inclusion of fixed effects. To remedy this, following Burgess et al. (2015), I allow these controls to vary over time (and thus remain in the model) by interacting them with a linear time trend.

Table 2: Regression Results

Dependent variable	Share of road spending [c, t]			
	Population share [c, 2009]			
	(1)	(2)	(3)	(4)
Aligned county [c] x devolution [t]	-0.79*** (0.226)	-0.71*** (0.189)	-0.70*** (0.181)	-0.50** (0.232)
Observations	287	287	287	287
R-squared	0.017	0.027	0.027	0.037
County and year fixed effects	Yes	Yes	Yes	Yes
(Population, area, urbanization rate) x trend	No	Yes	Yes	Yes
(Formal employment) x trend	No	No	Yes	Yes
(Main highway, border, dist. Nairobi) x trend	No	No	No	Yes

Notes: OLS regressions using the author's constructed panel data of road expenditure for 47 counties for the seven fiscal years from 2010/11 to 2016/17. Road spending data for the 47 counties was converted to conform to the 1963 district boundaries (41 districts), as in Burgess et al. (2015), for a total of 287 observations. Aligned county [c] is a binary variable equal to 1 if county *c* is ethnically aligned to the president (Kikuyu). Devolution [t] is a binary variable equal to 1 for the fiscal years 2013/14 to 2016/17. Columns 2-4 sequentially add controls interacted with time trends. First, Column 2 adds three *demographic controls*: (i) county population (2009), (ii) area in square km (area of 41 districts is used), and (iii) urbanization rate (2009). Column 3 adds a control for *economic activity*: total formal sector employment by county (2009). Column 4 adds three controls for *economic geography*: (i) a binary variable equal to 1 if a county is on the Mombasa-Nairobi-Kampala highway, (ii) a binary variable equal to 1 if a county is bordering Uganda or Tanzania, and (iii) the distance of the county (from the Euclidean centroid) to Nairobi (km). Robust standard errors clustered at the county level in parentheses. See Appendix 1 for descriptions and sources of key variables.

* significant at 10%; ** significant at 5%; *** significant at 1%.

The coefficient on the interaction term, δ , is negative and significant, and is robust to the inclusion of controls throughout all specifications. The magnitude on the coefficient of interest varies from -0.50 to -0.79. Taking the lower bound in Column 4, the estimated coefficient of -0.50

baseline year in the early 1960s to construct their controls, I use data from the *Socio-Economic Atlas of Kenya*, which codes data from Kenya's 2009 census (around my baseline year) by county and sub-location.

implies that, on average, $road_{ct}$ was reduced by about half in ethnically aligned counties after the implementation of devolution.¹⁷

In essence, these findings support the notion that devolution, in a context of ethnic favouritism, results in an ‘ethnic equality’ dividend – *above and beyond* the ‘ethnic equality’ dividend found in Burgess et al. (2015) for periods of democracy (though highly centralised democracy). Put another way, the analysis presented here indicates that devolution in Kenya *has*, in effect, deepened democracy as proponents assert by *further* constraining the president’s capacity to engage in ethnic favouritism. The evidence suggests that devolution altered state structure, brought government institutions ‘closer to the people’ and away from the ethnically biased hands of the president, and, in so doing, helped bring about a more equitable distribution of public resources as was the proclaimed goal of the 2010 Constitution.¹⁸ These significant results are even more striking considering that Kenya is still in the relatively early stages of devolution’s implementation and considering the widespread reports of attempts by the national government to delay transferring powers to the county governments (or to recentralise some county functions entirely) (Hassan, forthcoming).

Moreover, the fact that road spending made up 18 percent (or roughly one-fifth) of the total development budget for the national government in the last fiscal year of the study period (2016/17), implies that devolution’s ability to foster a more equitable distribution of such a consequential sum of government resources lends further significance to the above findings (Kinuthia, 2018).

4.2 Robustness Checks

4.2.1 Placebo Test

To test the key identification assumption of parallel trends more formally, placebo regressions are conducted. As mentioned, the most significant identification concern is that our regression coefficients capture a particular pre-existing trend correlated with our main explanatory variable that occurs regardless of state structure (centralised vs. decentralised). To ensure this is

¹⁷ This is in line with the graphical representation in Figure 1, as the road spending shares in aligned counties sharply decreased from above 1.5 pre-devolution, to around 1 for the duration of the post-devolution period.

¹⁸ The main mechanism through which devolution affects road spending is presumed to be increased institutional constraints on the president. While a thorough exploration of potential mechanisms is beyond the scope of this study, this mechanism is most plausible due to the fact that the *objective* formula that is now used in transferring revenue to the counties (see footnote 5) is not subject to presidential manipulation (a sharp change from the previously centralised and *subjective/discretionary* road spending powers of the presidency pre-devolution). This is supported by key informant interviews (Kinuthia, Interview).

not the case, placebo tests are run to check if ethnic alignment to the president explains patterns of road spending *before* devolution took place (2005-2011). This is a useful check, as the president (Kibaki) remained constant throughout this pre-devolution period. Therefore, given ethnic alignment does not change *and* state structure does not change from 2005-2011 we should not see that our main explanatory variable explains the pattern of road spending throughout this period. Table 3 presents the results of this placebo test for the preceding 7-year period in which devolution did *not* take place (2005-2011).

Table 3: Placebo Test Regression Results

Dependent Variable: $road_{ct}$, 2005-11				
	(1)	(2)	(3)	(4)
Aligned county [c] x devolution [t]	-0.50 (1.285)	-0.29 (1.353)	-0.38 (1.354)	-0.24 (1.488)
Observations	287	287	287	287
R-squared	0.019	0.033	0.042	0.067
County and year fixed effects	Yes	Yes	Yes	Yes
(Population, area, urbanization rate) x trend	No	Yes	Yes	Yes
(Formal employment) x trend	No	No	Yes	Yes
(Main highway, border, dist. Nairobi) x trend	No	No	No	Yes

Notes: OLS regressions using Burgess et al. (2015)'s panel data on road expenditure for seven fiscal years preceding the implementation of devolution (from 2004/05 to 2010/11). Refer to the notes from Table 2 for descriptions of the main explanatory variable and the controls. Robust standard errors clustered at the county level in parentheses. See Appendix 1 for descriptions and sources of key variables.

* significant at 10%; ** significant at 5%; *** significant at 1%.

The placebo regressions show that the estimated coefficients are insignificant throughout all specifications, as expected. The general pattern to note is that we see significant and robust coefficients for the period when devolution actually took place (2011-2017; see Table 2), and insignificant results for the period preceding devolution (2005-2011; see Table 3). Combined with the graphical analysis in Figure 1 such results strongly support the claim that the estimated coefficients in Table 2 are unlikely to be caused by pre-existing trends in road spending ($road_{ct}$).

4.2.2 The 2013 Election, the New National Government, and Cabinet Formation

Another potential concern is that the estimates could be biased as a result of contemporaneous changes in other areas (Angrist & Pischke, 2009). The most prominent change that occurred contemporaneously to devolution in March, 2013 was the election of a new national government. This could result in spurious estimates because if the new president or his new cabinet

differ significantly from their predecessors – and it is this difference (not devolution) that is driving the results – then the estimates in Table 2 will be biased. To investigate this, I examine both the two individual presidents themselves as well as their respective cabinets.

As mentioned, the newly elected president, Uhuru Kenyatta, is an ethnic Kikuyu (like Kibaki) and was Deputy Prime Minister and Finance Minister under President Kibaki. A review of contemporaneous media sources in the run up to the 2013 elections reveals that Kibaki's party, the Party of National Unity (PNU), signed a coalition agreement with Kenyatta's newly formed party, The National Alliance (TNA), six months before the 2013 elections took place (*Daily Nation*, 2012; *The Star*, 2012). The coalition agreement stipulated that PNU would not nominate a presidential candidate to run in the election, and instead would support the candidacy of Kenyatta. The facts that Kenyatta hails from the same ethnic group as Kibaki, that he held key ministerial positions in Kibaki's cabinet, and that he had signed a formal coalition agreement with the outgoing president's political party all strongly suggest that Kenyatta's victory would be more of a continuity in national policy than a sharp discontinuity of the type that could be driving the observed significant differences in road spending before and after 2013. Still, there is a possibility that the new cabinet brought in by the incoming president could be biasing the estimates.

To rule this out, I look at whether there are any significant differences in terms of ethnic representation between the cabinet of Kibaki's second term, and the cabinet formed by Uhuru Kenyatta upon his ascension to the presidency. If Kenyatta's new cabinet is significantly more representative, this (instead of devolution) could explain the more equitable road spending we observe post-2013.

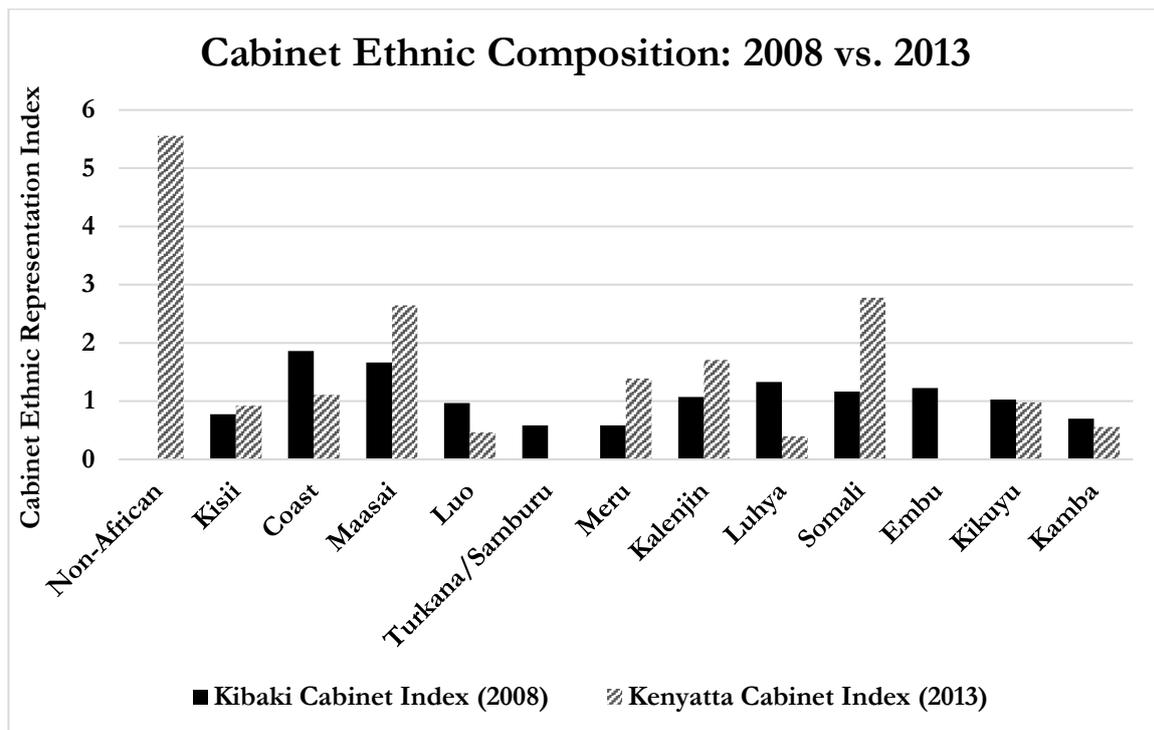
Figure 2 shows the ethnic composition of Kibaki's cabinet formed in 2008 and compares this to the ethnic make-up of Kenyatta's cabinet formed in 2013 upon assuming office. The cabinet index is constructed in much the same way as the outcome variable, $road_{ct}$: the share of ethnic group e in cabinet c is divided by that ethnic group e 's share of the total population in 2009. The intuition is also similar, with a value of 1 implying proportional representation, and a value above (below) 1 implying ethnic representation that is above (below) that ethnicity's share of the total population.

A formal comparison of means test between the cabinet index of the 2008 and 2013 cabinets is conducted – dropping the 'Non-African' outlier.¹⁹ The test results show that the means

¹⁹ Kenyatta appointed one Arab to his cabinet (Najib Balala, Cabinet Secretary for Tourism), despite Arabs making up less than 1 percent of the Kenyan population.

of the respective cabinet indices are not significantly different from each other (results not shown). What is striking to note in Figure 2 is that the Kikuyu share remains essentially constant between the two cabinets and extremely close to 1 (the proportional share), indicating that both Kikuyu presidents refrained from stocking their key ministerial positions with coethnics.²⁰

Figure 2: Comparing Cabinet Ethnic Composition



Source: The 2008 cabinet index was obtained from Burgess et al.'s online appendices and adapted with 2009 population figures (instead of their original 1962 population figures). The 2013 cabinet ethnic composition was obtained via Opalo (2013), and the cabinet index was then constructed by the author.

It is also possible that the particular minister in charge of transport/infrastructure was Kikuyu under Kibaki and non-Kikuyu under Kenyatta, and this change could explain the differing patterns in road spending observed before and after 2013 (instead of devolution). An examination of the different transport/infrastructure ministers shows that throughout the study period the ethnicity of the minister has remained Kikuyu: Amos Kimunya (2010-2013), Michael Kamau (2013-2015), and James Wainaina Macharia (2015-present).²¹

²⁰ This is in line with Francois, Rainer, and Trebbi (2015) who analyse the cabinet formation of 15 African countries and find that presidents appoint ethnically representative cabinets to guard against 'revolutions from outsiders' and 'coups from insiders'.

²¹ The ethnicity of Kamau and Macharia was ascertained via Opalo (2013). The ethnicity of Kimunya was ascertained via Wrong (2009), p. 242.

Overall, the above discussion illustrates that Kenyatta can be considered more of a continuation of Kibaki's policies than a sharp break from them, that the ethnic representation in both Kibaki's and Kenyatta's cabinets was statistically the same, and that the particular minister leading the transport/infrastructure department remained Kikuyu throughout the entire study period. Still, despite these facts, the nature of real-world empirical analysis is such that a true counterfactual cannot be observed, and thus it cannot be formally tested that Kenyatta's new regime is simply less prone to ethnic favouritism than Kibaki's. Yet, the preceding analysis is nonetheless reassuring as it reduces the likelihood that contemporaneous changes in the national government are driving the changes in road spending.

4.2.3 Other Robustness Checks

An additional concern is that road spending was simply diverted away from counties that had particularly developed road networks, and towards more underdeveloped counties where larger marginal gains could be had (and this would have happened regardless of devolution). If the former counties were predominantly Kikuyu-majority counties, and the latter were predominantly non-Kikuyu counties, this could be biasing our estimates. To check that this type of pattern is not driving our results I repeat the same regression specifications as reported in Table 2, but drop the top five counties in terms of kilometres of paved road (weighted by population) (see Kinuthia, 2018). The results are broadly consistent with the results found in our main regressions in Table 2, with the coefficient on the explanatory variable of interest remaining negative and significant throughout all specifications (results presented in Appendix 2). Such results lend confidence to the robustness of the main findings.

5. Limitations and Avenues for Future Research

There are several potential concerns pertaining to the above analyses worth delineating here. Chief among these concerns is whether the results reported in Section 4 can be interpreted causally. The quasi-experimental design, the placebo tests and robustness checks presented, and the addition of several variables that control for potentially omitted confounding factors, all strengthen the case for a causal interpretation. Still, such a causal interpretation relies on the internal validity of the difference-in-differences method employed. Namely, the key identification assumption of parallel road spending trends between the treatment (aligned) counties and quasi-control (non-aligned) counties before devolution must be satisfied. While this cannot be directly tested, this assumption is plausibly met given the graphical analysis in Section 3.3 and the placebo

tests run in Section 4.2.1. However, a key threat to internal validity still remains: contemporaneous changes in the national government brought about by the 2013 elections. While the discussion in Section 4.2.2 is reassuring in that it provides suggestive evidence that changes in the national government were *not* driving the observed changes in road spending, again, this cannot be formally tested. Thus, results must be interpreted with these caveats in mind.

Second, measurement error is also a potential concern. In particular, the use of a binary variable for *aligned_c* (an ethnic dummy) in lieu of a continuous variable may bias the estimated coefficients. As Appendix 3 lays out, data restrictions were such that a continuous variable for the ethnic composition of each of the new 47 counties could not be ascertained. Relatedly, the recent research of Dickens (2018) has used more nuanced ‘ethno-linguistic similarity’ measures as opposed to more black-and-white ethnicity measures and is thus able to find evidence of not just coethnic favouritism but also non-coethnic favouritism (towards allied or within-coalition ethnic groups). An interesting task for future research would be to examine if the main findings of this study remain robust to these different measures of ethnicity.

Third, this study constructed the outcome variable, *road_{ct}*, by totalling *all* road spending at both the county and national levels regardless as to whether that road spending went towards the construction of *new* roads or towards the maintenance of *existing* roads. Thus, a limitation of this study is that it cannot disentangle whether these different types of road spending are impacted differently by devolution. Theoretically, one may plausibly posit that spending on new roads may be relatively more susceptible to ethnic patronage as new road construction is more visible to voters than the upkeep of existing roads. Testing this hypothesis is left to future research. In addition, a related limitation is that this study only examines the effect of devolution on one public good (roads). As mentioned in Section 2.3, roads are relatively more visible and attributable to a particular branch of government than other devolved public goods (e.g., health services). Harding (2015) shows how the varying levels of visibility/attribution that particular public goods possess may affect their levels of provision by politicians. Therefore, an important line of inquiry for future research is to examine whether the main findings in this study carry over to several other devolved public goods.

Fourth, the external validity of the main findings is open to debate. While this study’s focus on decentralisation reforms in one country – Kenya – confers advantages in terms of internal validity, there is an obvious trade-off in the extent to which the findings from this one country can be generalised to other countries. Still, it can be argued that Kenya is relatively more representative

of the ‘average’ country in SSA than others that have undergone decentralisation reforms, and thus is a better country from which to generalise results.²²

Fifth, another limitation of this study is that a thorough exploration of possible mechanisms underlying the observed results is beyond its scope. As noted in Section 4.1 (see footnote 18), suggestive evidence (as well as key informant interviews) points to the most plausible mechanism being that the new Constitution effectively tied the hands of the president as it devolved 15 percent of national revenue down to 47 new county governments via an *objective* formula, which is not subject to presidential manipulation (see footnote 5). However, this mechanism is not formally tested and others could be at play. For example, subnational mechanisms like county electoral competition or the level of ethnic diversity in a particular county could be potential mechanisms through which devolution affects road spending (and could potentially produce heterogeneous effects).²³ Also beyond the scope of this study is an investigation into whether devolution has simply transferred ethnic patronage from the national- to the county-level and thus could perhaps end up marginalizing ethnic minorities *within* counties, as some scholars suggest (see D’Arcy & Cornell, 2016). An examination of the mechanisms at play, of possible heterogeneous effects, as well as the question of ethnic patronage merely being transferred to the county-level are all worthy directions for future research.

6. Conclusion and Policy Implications

The conventional wisdom asserts that changes to formal state institutions in the African context often fail to effectively constrain SSA’s powerful, ‘imperial’ presidents, as it is precisely these political elites who are involved in both the design and implementation of such institutional reforms (Hassan, forthcoming). Given that these ‘big man’ presidents have an incentive to subvert any decentralisation of their power, it follows that the literature is largely pessimistic about the extent to which devolving formal state structures can bring about the theorized benefits of decentralisation – such as more equitable public goods provision – in practice (see Dickovick, 2014; Erk, 2014; Suberu, 2009).

²² The other decentralised countries (federations or quasi-federations) in contemporary SSA are Nigeria (which has by far the largest population in SSA), Sudan (its largely Arab north is not the norm on the sub-continent), Ethiopia (which has never experienced colonisation), Comoros (a small, island nation), and South Africa (which endured the unique historical experience of apartheid).

²³ See Boone (2003) and Faguet (2012) on how subnational dynamics can produce heterogeneous effects under decentralised state structures.

On the whole, the main findings of this study go against this conventional pessimism in the literature: I find formal institutions matter in the distribution of public goods in the African context. The institutional reforms first promulgated in Kenya's 2010 Constitution and implemented in 2013 initiated what the World Bank called, "among the most rapid and ambitious devolution processes going on in the world," (World Bank, 2014: p. viii). This decentralisation of state structure resulted in significantly more equitable road spending in Kenya, thus achieving one of the main objectives of the 2010 Constitution. Moreover, the magnitudes are non-trivial with the lower-bound estimate implying that, after devolution, the outcome measure of road spending was reduced by *half* in counties ethnically aligned to the president (relative to non-aligned counties), bringing the road spending share of both aligned and non-aligned counties significantly closer to 1 (the proportional share). This 'ethnic equality' dividend brought about by decentralising political and fiscal power away from the president towards subnational governments is *above and beyond* the dividend found in Burgess et al. (2015) for democratic (but centralised) periods. While there are limitations to this study that suggest an agenda for future research (Section 5), the fact that the findings remain consistently significant to the inclusion of many control variables and across several robustness checks lends further confidence to the results.

These results have several policy implications. First, in the Kenyan context, given the early success of decentralisation and the relatively nascent stage of the reforms, efforts should be made to further strengthen subnational state capacity. One key way in which donors can help bolster county capacity is through a stipulation in the Constitution that allows donors to make transfers *directly* to county governments, thus bypassing multiple tiers at the national-level (see GoK, 2012: 138). Second, and more broadly, the findings suggest that when implementing development projects in multi-ethnic countries, if donors favour those countries with more devolved state structures, donor funds are likely to be allocated more equitably. This is particularly pertinent for those donors who do not place as many restrictions on their investments relative to multilaterals like the World Bank or IMF (see, for example, Dreher et al. (2016), who find that Chinese aid is significantly more likely to be used for ethnic patronage by African leaders, while World Bank aid is not). More specific to the particular public good examined in this study (roads), China's Belt and Road Initiative (BRI) – a gargantuan, decades-long, multi-trillion-dollar infrastructure investment initiative – is set to make vast in-roads into the sub-continent's infrastructure sectors in the coming years (*The Economist*, 2018). Given the staggering levels of planned investment, the findings of this study suggest that those countries with more devolved institutions will be better placed to avoid large sums of money being misallocated due to centralised ethnic patronage.

Overall, this study contributes to the literature that examines the way in which ethnic politics interacts with changes in the institutional design of state structures to impact public goods provision (see Posner, 2012). In the spirit of Ostrom et al. (1993) and other institutionalists, the findings support the notion that while institutional design is not a panacea, it can still effectively structure the ‘rules of the game’ so as to significantly check abuses of power by the state and political elites, and in so doing bring about a more equitable distribution of public resources (see Acemoglu & Robinson, 2012; North et al., 2009; Fukuyama, 2011).

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Appendix 1: Data Sources and Description of Key Variables

	Description	Source
Main Dependent Variable		
Share of Road Expenditure [c,t]/ Population Share [c, 2009]	Share of road spending (out of the total national road budget) of county c in year t divided by that county c 's population share (out of the total national population) in 2009.	<i>Expenditure</i> : Development Estimates of Kenya (2010/11 to 2016/17), Medium Term Expenditure Framework (MTEF) Budget Reports (2010/11 to 2020/21); <i>Population</i> : Socio-Economic Atlas of Kenya. See Wiesmann et al. (2016).

Main Regressors		
(a) Aligned County [c,t]	Takes a value of 1 if county c is coethnic to the president in year t .	<i>Aligned</i> : Socio-Economic Atlas of Kenya. See Wiesmann et al. (2016).
(b) Devolution [t]	Takes a value of 1 if year t is equal to or after the fiscal year 2013/14.	<i>Devolution</i> : Timeline from Burbidge (2018).
Control Variables *Note: All control variables are interacted with a linear time trend so they are not purged by the inclusion of fixed effects.		
(a) Population [c, 2009] x trend	Population of county c in 2009.	<i>Population</i> : Socio-Economic Atlas of Kenya (derived from the 2009 Kenyan census). See Wiesmann et al. (2016).
(b) Area [c] x trend	Area in square kilometres of county c .	<i>Area</i> : Burgess et al. (2015). See online appendices.
(c) Urbanization Rate [c, 2009] x trend	Percentage of the population in county c living in urban areas in 2009. (includes 'core urban' and 'peri-urban' residents within towns having at least 2,000 inhabitants).	<i>Urbanization Rate</i> : Kenya County Fact Sheets published by Kenya's Commission on Revenue Allocation.
(e) Total Employment in the Formal Sector [c,2009] x trend	Total formal sector employment in county c in 2009.	<i>Formal Sector Employment</i> : Socio-Economic Atlas of Kenya. See Weismann et al. (2016).
(g) Mombasa-Nairobi-Kampala Corridor [c] x trend	Takes a value of 1 if county c is located on the Mombasa-Nairobi-Kampala Corridor.	Burgess et al. (2015). See online appendices.
(h) Border county [c] x trend	Takes a value of 1 if county c is bordering Uganda or Tanzania.	Burgess et al. (2015). See online appendices.
(i) Euclidean Distance (km) to Nairobi [c] x trend	County c 's centroid Euclidian distance to Nairobi in kilometres.	Burgess et al. (2015). See online appendices.

Appendix 2: Other Robustness Checks

The table below reports regression results where I replicate the specifications presented in Table 2, but the top five counties in terms of kilometres of paved road built (weighted by population) are dropped from the analysis. Results remain negative and significant throughout all specifications (broadly conforming to the results in Table 2).

Regression Results to Robustness Check

Dependent variable	Share of road spending [c, t]			
	Population share [c, 2009]			
	(1)	(2)	(3)	(4)
Aligned county [c] x devolution [t]	-0.57*** (0.201)	-0.40** (0.164)	-0.49*** (0.177)	-0.40** (0.183)
Observations	252	252	252	252
R-squared	0.010	0.022	0.023	0.031
County and year fixed effects	Yes	Yes	Yes	Yes
(Population, area, urbanization rate) x trend	No	Yes	Yes	Yes
(Formal employment) x trend	No	No	Yes	Yes
(Main highway, border, dist. Nairobi) x trend	No	No	No	Yes

Notes: Refer to the notes from Table 2 for descriptions of the main explanatory variable and the controls. Robust standard errors clustered at the county level in parentheses. The top five counties in terms of kilometres of paved road built (weighted by population) are ascertained from Kinuthia (2018). See Appendix 1 for descriptions and sources of key variables.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix 3: County Ethnic Composition, 2009

The below table is adapted from the *Socio-Economic Atlas of Kenya* (Weismann et al., 2016). Note that only the share of the largest ethnic group was provided. Population shares of smaller ethnic groups within each county are not included in the Atlas. This was the main factor that necessitated utilizing a binary variable for $aligned_c$ as opposed to a continuous variable (that would denote the percentage share of Kikuyu out of *every* county's total population). Further county-level data collection is needed to verify that the findings of this paper are robust to using a continuous variable for $aligned_c$.

It should be noted that the last census in Kenya was in 2009, and the next census is due to take place in 2019 (the first census following devolution, and thus the first to contain county-level data). With this new census data, a continuous ethnic variable at the county-level could be constructed. Thus, this is left to future research.

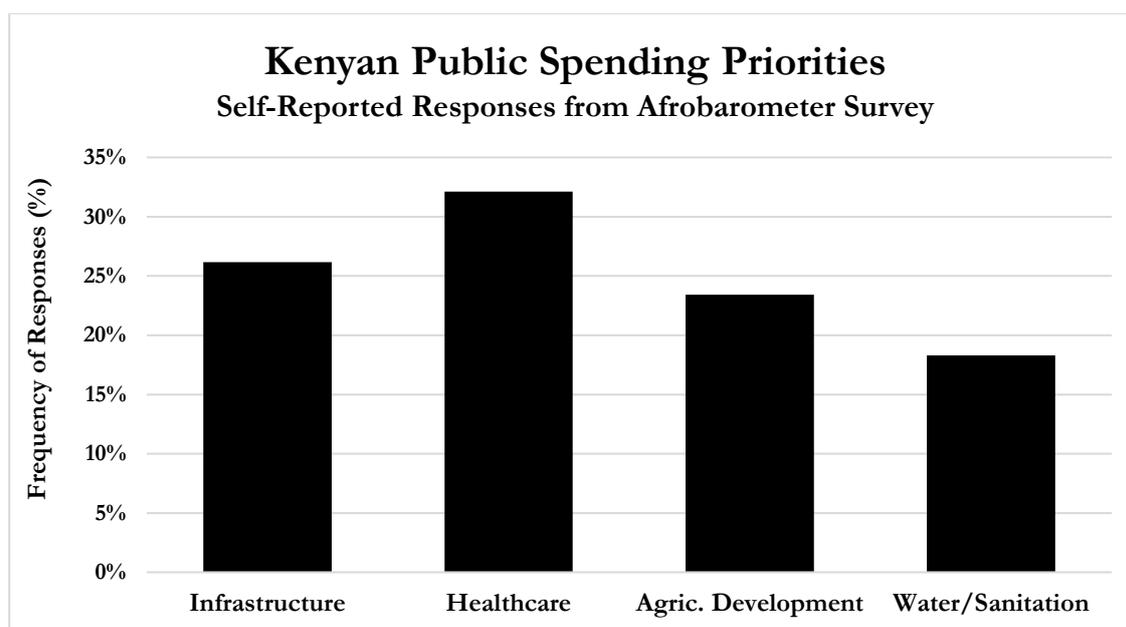
County	Largest Ethnic Community	Share of Largest Ethnic Community in County Population	Second Largest Ethnic Community	Third Largest Ethnic Community
Baringo	Kalenjin	92.2%	Kikuyu	Luhya
Bomet	Kalenjin	95.7%	Kikuyu	Maasai
Bungoma	Luhya	82.9%	Kalenjin	Teso
Busia	Luhya	57.2%	Teso	Luo
Elgeyo Marakwet	Kalenjin	92.6%	Luhya	Others
Embu	Embu	50.4%	Mbeere	Kamba
Garissa	Somali	79.6%	Others	Kamba
Homa Bay	Luo	87.5%	Basuba	Kisii
Isiolo	Borana	37%	Somali	Samburu
Kajiado	Maasi	44.5%	Maasai	Kamba
Kakamega	Luhya	92.4%	Luo	Kikuyu
Kericho	Kalenjin	87.5%	Kisii	Luo
Kiambu	Kikuyu	80.9%	Kamba	Luhya
Kilifi	Miji Kenda	86.5%	Kamba	Swahili
Kirinyaga	Kikuyu	95.2%	Kamba	Embu
Kisii	Kisii	96.5%	Luo	N/A
Kisumu	Luo	88.9%	Luhya	Kalenjin
Kitui	Kamba	96.6%	Tharaka	Kikuyu
Kwale	Miji Kenda	82.7%	Kamba	Luhya
Laikipia	Kikuyu	63%	Maasai	Kalenjin
Lamu	Swahili	30.2%	Kikuyu	Mijikenda
Machakos	Kamba	91%	Kikuyu	Luhya
Makueni	Kamba	98.1%	Kikuyu	Luhya
Mandera	Somali	97.6%	Gabra	Swahili
Marsabit	Gabra	28.7%	Borana	Rendille
Meru	Meru	93.7%	Kikuyu	Tharaka
Migori	Luo	60.2%	Kuria	Luhya
Mombasa	Miji Kenda	30.1%	Kamba	Luo
Muranga	Kikuyu	94%	Luhya	Kamba
Nairobi	Kikuyu	29.4%	Kamba	Luo
Nakuru	Kikuyu	52.4%	Kalenjin	Luhya
Nandi	Kalenjin	77.4%	Luhya	Luo
Narok	Maasai	51.4%	Kalenjin	Kikuyu
Nyamira	Kisii	97.2%	Luo	N/A
Nyandarua	Kikuyu	96.3%	Luhya	Kisii
Nyeri	Kikuyu	94%	Meru	N/A

Samburu	Samburu	78.8%	Turkana	Kikuyu
Siaya	Luo	94.8%	Luhya	Kalenjin
Taita Taveta	Taita	63.3%	Kamba	Taveta
Tana River	Pokomo	27.5%	Orma	Wardei
Tharaka Nithi	Meru	54.8%	Tharaka	Turkana
Trans Nzoia	Luhya	52%	Kalenjin	Kikuyu
Turkana	Turkana	94.3%	Others	Luhya
Uasin Gishu	Kalenjin	58.1%	Luhya	Kikuyu
Vihiga	Luhya	95.5%	Luo	Kalenjin
Wajir	Somali	98.7%	Gabra	N/A
West Pokot	Kalenjin	95.1%	Luhya	Turkana

Source: See Socio-Economic Atlas of Kenya (Weismann et al., 2016).

Appendix 4: The Public Spending Priorities of Kenyan Citizens

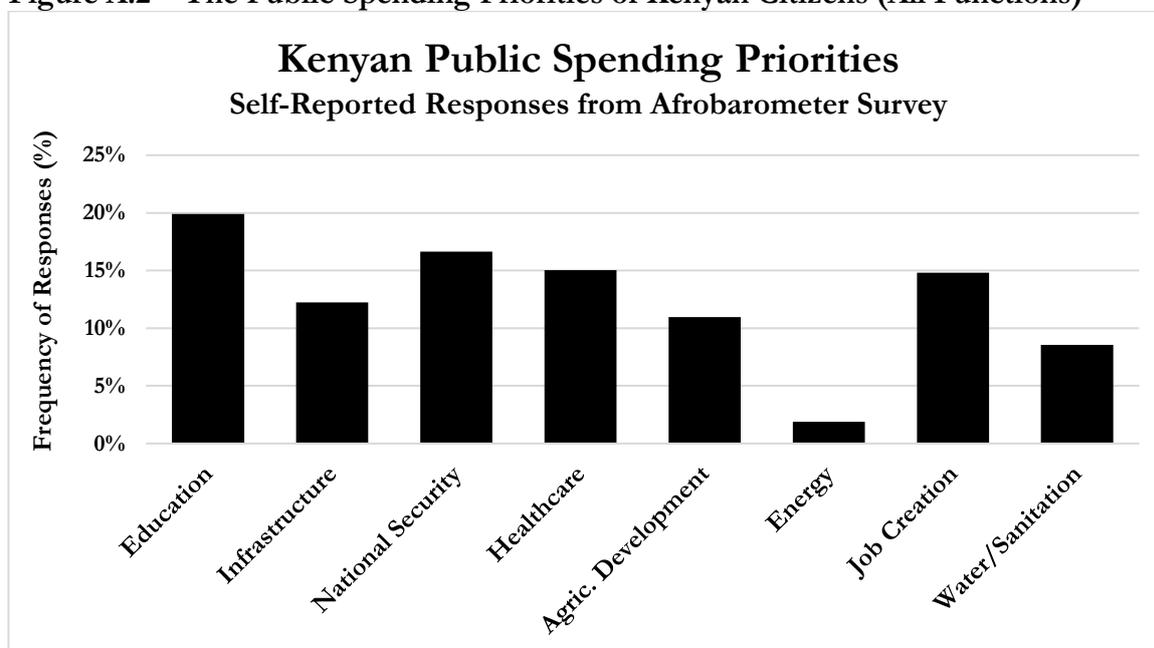
Figure A.1 – The Public Spending Priorities of Kenyan Citizens (Devolved Functions)



Source: Afrobarometer, Round 6. $N = 2220$. Respondents were asked, “If the government of this country could increase its spending, which of the following areas do you think should be the top priority for additional investment?” Respondents were allowed to list their first and second priorities. Both first and second priorities were combined to ascertain the cumulative frequency of responses reported above (in %). Note: only when first and/or second priorities listed *devolved* functions are they included. For a graphical depiction of *all* responses, see Figure A.2 below.

While Figure A.1 only includes answers from respondents who listed devolved functions as their top priorities, *all* answers are included in Figure A.2 below (regardless as to whether they fall under the jurisdiction of the national or county governments).

Figure A.2 – The Public Spending Priorities of Kenyan Citizens (All Functions)



Source: Afrobarometer, Round 6. $N = 4746$. Respondents were asked, “If the government of this country could increase its spending, which of the following areas do you think should be the top priority for additional investment?” Respondents were allowed to list their first and second priorities. Both first and second priorities were combined to ascertain the cumulative frequency of responses reported above (in %).

Appendix 5: List of Key Informant Interviews

Name	Organisation and Position	Contact Information
John Kinuthia	International Budget Partnership (Kenya); Lead Researcher	Email: jkinuthia08@gmail.com
Professor Ameet Morjaria (co-author of Burgess et al., 2015)	Kellogg School of Management at Northwestern University; Assistant Professor, Managerial Economics & Decision Sciences	Email: a.morjaria@kellogg.northwestern.edu
Anthony Mutua	Kenya National Highways Authority (KeNHA); Regional Manager, Western Region	Email: rm.western@kenha.co.ke
Anonymous	Kenya National Highways Authority (KeNHA); Road Engineer, Western Region	Anonymous