Ethnic Favoritism

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-PRELIMINARY DRAFT-

Abstract

A large literature emphasizes the existence of ethnic favoritism. Yet, there are few quantitative studies that extend beyond using the ethno-linguistic fractionalization index. This paper documents systematically the magnitude of ethnic favoritism. In particular, we investigate road building in Kenya by putting together novel datasets: a panel dataset on road development for the entire history of modern Kenya and splicing this with historical data on the ethnicity of political leaders. We set up a simple framework which uses two plausibly exogenous variations in political changes to see the effects on ethnic favoritism. These changes are: (i) changes in the identity of the leader, and (ii) regime changes *within* the same leader to test whether co-ethnics of leaders receive more roads. We find robust evidence that political regime changes matter. Under autocracy, leaders disproportionately invest in those districts where their ethnicity is dominant, however this effect is attenuated when the same leaders are in a democratic setting, in favor of other tribes. The results suggest that the effect of democracy is to increase constraints on the leader.

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1 Introduction

Scholarly work in economics and political science has emphasized the existence and widespread prevalence of ethnic favoritism, yet the primary focus has been on looking at the effects of ethno-linguistic fractionalization (ELF) on outcomes (e.g. growth, provision of public goods etc.) The literature seems to have stepped aside from quantifying the extent and magnitude as well the mechanisms at play behind ethnic favoritism.[1] This could be partially explained by the difficulty of measuring ethnic favoritism as governments are often reluctant to publish disaggregated budgetary data that indicates their geographical location. In this paper, we are able to overcome this serious challenge by tracking road development (both expenditure budgets and physical building) in Kenya.

Kenya provides an ideal laboratory for testing as well as understanding the mechanisms behind ethnic favoritism. Firstly, ethnicity is salient in the Kenyan political space, with a large collection of anecdotal evidence on ethnic patronage (Posner 2005; Wrong 2009; Morjaria 2011; Kramon and Posner 2011a). Secondly, administratively the country is governed at the district level and ethnic groups are homogenous within a district. Thirdly, we are able to track road development at the district level by using development budgets and mapping them onto a GIS database. Fourthly, even though our focus is on one country, the evolution of Kenya in terms of both political regime and growth can be seen as a basket case in the context of Sub-Saharan Africa.

Aside from systematically documenting ethnic favoritism this paper also tries to understand plausible mechanisms behind curtailing this behavior. In particular, we look at political regime changes from the multi-party state to the single-party state and back to multi-party. Figure 1 displays the evolution of the Polity IV index for the average Sub-Saharan African country as well for Kenya. [2] The typical African country started as an imperfect democracy _ or *autocracy* _ at independence, was an autocracy in the 1970s and 1980s, before progressing towards democracy from the early 1990s. This return to democracy was gradual. Thirty countries switched from being single-party states to

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[1]Exceptions are Franck and Rainer (2010) and Hodler and Raschky (2010). These studies also investigate whether African presidents favor their own ethnic group, but their evidence is based on cross-country regressions, for the recent period only. Besides, we examine the impact of democratic transitions *within* the same leader, while Hodler and Raschky (2010) just compare democratic and non-democratic countries.

[2]The combined Polity score goes from -10 (*hereditary monarchy*) to +10 (*consolidated democracy*). Polity IV recommends the following classification: *autocracies* (-10 to -6), *anocracies* (-5 to +5) and *democracies* (+6 to +10).

multi-party states between the years 1989 and 2000. Yet, of the thirty-nine multi-party states in 2000, only eight were democracies while thirty-one were anocracies. Multi-party elections were not necessarily "fair", and the newly elected president was often the incumbent autocrat (Van de Walle 2002). By 2009 the number of states classified as democracies has nearly doubled and now stands at sixteen. Many African states now have multi-party elections and are increasingly democratic.

Interestingly, Figure 2 shows how economic growth in Africa is positively correlated with democracy. This positive impact of democratization on economic growth has been emphasized by the empirical literature (Jones and Olken 2005; Persson and Tabellini 2006, 2007). One of the potential mechanisms behind this relationship could be that democratic institutions constrain distributive politics, especially in the African context of ethnic politics. Easterly and Levine (1997) and Montalvo and Reynal-Querol (2005) find that ethnic fragmentation reduces economic growth through worse public policies and political instability. In democratic regimes, leaders must follow a general interest policy which aims to maximize economic welfare. Yet, this effect of democracy could be due to democracies selecting better leaders (Besley and Reynal-Querol 2011) or democracies imposing checks and balances on the whereabouts of leaders (Persson, Roland and Tabellini 1997; Besley and Kudamatsu 2008).

We find two robust results. First, autocratic leaders disproportionately invest in districts where their ethnicity is dominant. These effects are substantial: in autocracy, presidential districts receive on average 2.7 times more road expenditure and 4.7 times more paved roads than their predicted by their population share. Second, ethnic favoritism is reduced when the state is under a multi-party system, in favor of the other tribes of the country. Each tribe now receives as much road investments as predicted by their their population share. We argue that this effect goes through democracy shaping incentives. The political representation of minority groups does not increase in democracy, but leaders who hold the best cabinet positions behave differently when they face a multi-party system. This strongly suggests that democracy offers some forms of effective checks and balances.

Our paper is related to the literature on the role of democratization – whether in the form of enfranchisement, multi-partyism, political reservation or media freedom – in promoting economic development. Macroeconomic studies have emphasized the impact of democratization on economic growth (Jones and Olken 2005; Persson and Tabellini 2006,

2007). Other articles argues that democratization reduces private transfers and increases the provision of public goods (Besley and Kudamatsu 2006; Khemani 2007; Kudamatsu 2011). Lastly, various studies have looked at the welfare impact of increased political representation for disadvantaged groups, whether the poor (Acemoglu and Robinson 2000; Pande 2003; Banerjee and Somanathan 2007), the vulnerable (Besley and Burgess 2002; Strömberg 2004), women (Chattopadhyay and Duflo 2004; Miller 2008), or backward sectors (Brown and Mobarak 2009). Overall, democracies produce both a more balanced allocation of state funds and redistribution towards minority groups. Since Kenya has never been a fully-fledged democracy, this means even a transition from autocracy to anocracy can constrain ethnic favoritism.

Our focus on road investments also connects with the literature on transportation infrastructure investments. Recent research has confirmed that transportation infrastructure could have large positive welfare effects (Michaels 2008; Banerjee, Duflo and Qian 2009; Donaldson 2010). Conversely, the development literature often mentions the conjunction of bad geography and poor infrastructure as an obstacle to trade expansion and growth in Africa (Radelet and Sachs 1998; Limão and Venables 2001; Buys, Deichmann and Wheeler 2010). Our paper shows that the distribution of transportation infrastructure investments, and not just their level, can potentially affect trade and growth in Africa.

The remainder of the paper is organized as follows. Section 2 outlines a simple conceptual framework. Section 3 presents the historical background of roads and politics in Kenya and the data collected. Section 4 presents the empirical strategy and the main results. Section 5 discusses robustness of the main results, some additional results and channels, while section 6 concludes.

2   Conceptual Framework

Consider a repeated economy populated by infinitely lived agents that discount the future at rate δ. There is a continuum of size 1 of citizens divided into two ethnic groups, A and B, and the population share of group A is π. There are also two large countable sets of potential country presidents, that belong to each of the ethnic groups, A and B. At any point in time, there is a president in power who decides on taxation τ and on the amount of group-specific public goods to be provided. Denote by η^{AA} the amount

of investment in public goods that group A receives if the president belongs to group A, and denote by η^{AB} the amount of investment in public goods that group A receives if the president belongs to group B. Define η^{BA} and η^{BB} equivalently. Groups receive linear utility from public goods.[3]

For simplicity, we assume that the president can only charge a lump-sum tax τ on all citizens and cannot discriminate across groups.[4] When deciding on public goods, he is able to direct spending to his preferred districts, but only up to the constraints that institutions impose on him. We denote by $\theta \in [1, \infty)$ the weakness of these institutions, and we parametrize the constrains as follows.[5] A president of type $j \in \{A, B\}$ can set up η^{Aj} and η^{Bj} such that

$$\eta^{Aj} \leq \theta \eta^{Bj}$$
$$\eta^{Bj} \leq \theta \eta^{Aj}$$

obviusly only one of these constraints can be binding at any given time.

We assume that electoral institutions are also relatively weak, and the active co-laboration of one's co-ethnics is necessary to keep power. Given the different degress of institutionalization we do not take a strong stance on what this co-laboration means in practice, but it ranges from voting for the appropriate candidates to exerting violence to prevent other ethnic groups the full exercise of their democratic rights. To capture this in a simple way we assume that an acting president that receives the support of his ethnic group stays in power with probability $\bar{\gamma}$. If the acting president does not receive support, he loses his position with probability 1 and an open succession takes place in which the new ruler will belong to the same ethnic group as the ousted president with probability $\underline{\gamma}$, for $1 > \bar{\gamma} \geq \underline{\gamma} > 0$. Since these transitions are in many cases weakly institutionalized and may involve coups and violence, we assume that when the ruler does not receive the support of his group the state cannot perform its functions for a period, while the transition is resolved.

While the presidents belong to an ethnic group, they do not particularly care about the other members of the group. Rather, we assume that they try to maximize the

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[3]This will allow us to deflect criticism regarding the fact that roads are durable: with linear utility, every additional patch of road provides the same utility to citizens.

[4]The empirical evidence is mixed, so we take this simplifying assumption. Moreover, τ here includes legal taxes and also indirect ways of extracting rents. The assumption of no-discrimination is therefore equivalent to assuming that the cost of rent-extraction fall equally on all citizens.

[5]This simple parametrization is identical to Besley and Persson (2010).

amount of resources they can extract. Each period, the amount of resource extraction by a leader of group j is given by

$$\pi \left(\tau - \eta^{Aj} \right) + (1 - \pi) \left(\tau - \eta^{Bj} \right),$$

which, for each group, takes into account the taxes taken in and the expenditure in public goods.

The law of motion of public goods for group $j \in \{A, B\}$ is as follows:

$$G_t^i = G_{t-1}^i + R(\eta^{ij})$$

where $R(.)$ is increasing and concave with $R(0) = 0$. This law of motion ignores depreciation (for simplicity) and assumes that there are absorption constraints. The marginal return to money devoted to building roads is decreasing (as prices increase, firm capacities are strained, etc).

The citizens of group i receive labor income l, pay taxes τ, and enjoy public goods G_t^i which gives them the following simple instantaneous utility in period t:

$$l - \tau_t + G_t^i$$

At any point in time, this economy is in one of two payoff-relevant states, $S_t \in \{A, B\}$ which capture which ethnic group the leader in power belongs to.[6]

The timing of the game, starting with a leader from group $j \in \{A, B\}$ is as follows:

1. The leader announces the policy vector $P_t = \left\{ \tau^j, \eta^{Aj}, \eta^{Bj} \right\}$

2. The citizens of goup $j \in \{A, B\}$ decide whether to support the leader, $s_t = 1$ or not $s_t = 0$

3. If $s_t = 1$, P_t is implemented and payoffs are realized. Next period starts with $S_{t+1} = S_t$ with probability $\bar{\gamma}$, and the state switches with probability $1 - \bar{\gamma}$.

4. If $s_t = 0$, the leader is immediately ousted and the transition vector $P = \{0, 0, 0\}$ is implemented. With probability $\underline{\gamma}$ the new ruler belongs to the same group as the ousted ruler and hence $S_{t+1} = S_t$. With probability $1 - \underline{\gamma}$ the state switches to the other group.

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[6]There is also the possibility of using the existing road stock as a state which can complicate things. Think about this.

We solve this game for the Markov Perfect Equilibrium (MPE) of the game. Strategies can therefore only be conditioned on the state and past play within the stage game.

We proceed by backwards induction. Suppose without loss of generality that the state is $S_t = A$. Hence we need to examine first the decision of group A to support the president as a function of the policy $P_t = \{\tau^A, \eta^{AA}, \eta^{BA}\}$ that he has proposed at stage 1. To do this, it is useful to add some notation. Denote by $V^i(S)$ the value function for a citizen of group $i \in \{A, B\}$ in a subgame that starts in state $S \in \{A, B\}$. Given the given policy vector P_t and the expected path of play given by the value functions, a citizen of group A, if supporting $(s_t = 1)$ obtains:

$$l - \tau^A + G_t^A + \delta \bar{\gamma} V^A(A) + \delta \left(1 - \bar{\gamma}\right) V^A(B).$$

Alternatively, if the group withdraws support $(s_t = 0)$, citizens obtain:

$$l + G_{t-1}^A + \delta \underline{\gamma} V^A(A) + \delta \left(1 - \underline{\gamma}\right) V^A(B).$$

Hence, the support condition reduces to:

$$\tau^A - R(\eta^{AA}) \leq \delta \left(\bar{\gamma} - \underline{\gamma}\right) \left(V^A(A) - V^A(B)\right). \tag{1}$$

By subgame perfection, the ruler always wants to satisfy this condition. Failing to do so implies his immediate loss of power. Hence, when the ruler decides on the policy to announce, he maximizes his rents subject to (1) and the insitutional constraints. His program is therefore the following

$$\max_{\tau^A, \eta^{AA}, \eta^{AB}} \pi \left(\tau^A - \eta^{AA}\right) + (1 - \pi) \left(\tau^A - \eta^{BA}\right) + \delta \bar{\gamma} W^A$$

subject to

$$\eta^{AA} \leq \theta \eta^{BA} \tag{λ}$$

$$\eta^{BA} \leq \theta \eta^{AA}$$

$$\tau^A - R(\eta^{AA}) \leq \delta \left(\bar{\gamma} - \underline{\gamma}\right) \left(V^A(A) - V^A(B)\right) \tag{μ}$$

where W^A is the value of the continuation game for a president from group A. The first order conditions of this game yield

$$\pi + 1 - \pi = \mu$$
$$-\pi - \lambda + \mu R'(\eta^{AA}) = 0$$
$$-(1 - \pi) + \theta \lambda = 0$$

So, eliminating λ, we have

$$\begin{aligned}
\mu &= 1 \\
R'(\eta^{AA}) &= \pi + \frac{1-\pi}{\theta} \\
\eta^{AA} &= \theta\eta^{BA}
\end{aligned}$$

hence the institutional constraint is always binding, and public goods to the group of the president are excessively provided if $\theta > 1$. Indeed if $\theta = 1$ public investment is equally and efficiently distributed. The mathematical proof is available in appendix B.

3 Historical Background and Data

In this section, we describe the essential features of the Kenyan economy, the political system and the data that we have collected to analyze how political regime changes affect the allocation of public investments.

3.1 New Data on Kenya, 1889-2011

To evaluate the impact of political regime changes on the spatial allocation of public investments, we construct a new panel data set of 41 Kenyan districts, which we track almost annually from 1889 to 2011.[7] Further details on the data collected on road investments and ethnic politics is explained in the Data Appendix A.

We first construct a panel data set of road investments for the whole period of Kenya's history starting from the British colonization era. Our main variable is road development expenditure for a district in a particular year.[8] The panel data was recreated using GIS and annual reports listing individual road projects and their related costs. Our second key variable is the total length (km) of paved and non-paved roads at the district level. This variable is an unbalanced panel in the time dimension as maps are not available every year.[9] The first paved road in Kenya was built in 1945. From 1955, we are also able to distinguish improved (laterite) and dirt roads within the category of unpaved roads.

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[7]The 41 districts correspond to the administrative decomposition of Kenya in 1963. These district boundaries have remained stable until 1992. These districts belong to 8 provinces.

[8]Road expenditure can be separated into *road development expenditure* (investments) and *road recurrent expenditure* (maintenance). Our data only allows us to capture road development expenditure and not maintenance at the district level. We find that 65.3% of the total 1963-2010 road expenditure was allocated to road development expenditure.

[9]Our data points are 1889-1961, 1964, 1967, 1969, 1972, 1974, 1979, 1981, 1987, 1989, 1992 and 2002.

We have the total length (km) of paved, improved and dirt (or just unpaved) roads at the district level for selected years. This data was also created using GIS and historical road maps and colonial reports.[10] In essence, we can track road investments in terms of expenditure and physical building. As we exploit the variation in political regime changes, using annual data is essential. We focus on using road development expenditure as our main variable and we use the physical road building data to strengthen our results.

In order to investigate the ethnic favoritism dimension, we then splice our road panel dataset with data on ethnic politics in Kenya. In particular, we construct a database on the position, ethnicity and district of birth of cabinet members between 1963 and 2011.[11] This allows us to track the representation of each ethnic group in the politics space.[12] As mentioned earlier, our unit of analysis is the district, as they are ethnically homogenous (see appendix A figure 1). These boundaries have remained stable and were demarcated by the British.[13] Hence, we can relate changes in the ethnicity of political leaders and changes in the spatial allocation of road investments.

3.2 Road Investments in Kenya

Road expenditure are the single largest item in terms of public investments. They represented 15.2% of the total 1963-2010 development budget. By comparison, other public investments such as education, health and water respectively received 5.5%, 5.7% and 6.5% of the total development expenditure budget.[14]

The Kenya system of road funding has been centralized for most of the period of study, with Provincial and District Commissioners passing up requests for projects to the Ministry of Public Works.[15] The Ministry of Public Works deals with those requests and prepares a national strategy for road building. The Ministry of Finance then over-

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[10]As detailed in Data Appendix A, the Kenyan government has not conducted a road survey since 2002.

[11]We have data for all the election years. Elections for the National Assembly took place even during single-party autocracy years to renew the tenure of the members of parliament. Of course, all candidates belonged to and were from the single-party.

[12]We use classification of ethnic groups from the population census, see appendix A table 2

[13]Further, the ethnic population census for the years 1948, 1962, 1969, 1979, 1989, 2003 and 2009 show stability in the ethnic group shares over time (see appendix A table 3).

[14]The respective shares of roads, education, health and water are not significantly different in single-party autocracy versus multi-party democracy.

[15]The Ministry of Public Works has been in charge with planning and building roads, except in 1979-1988 when it was under the Ministry of Transport & Communications, and also during 2008-2011 when a specific Ministry of Roads was setup.

sees and resolves competing claims from the different Ministries and overall oversight is exercised by the Office of the President. Barkan and Chege (1989) provides a good description of the system. In essence, Provincial Commissioners were nominated by the Office of the President, which guaranteed their loyalty by rewarding them with unlimited authority on their province. As a result, a disproportionate share of provincial and district commissioners were coming from the ethnic group of the president and this ensured that power remained highly centralized.[16]

Figure 3 depicts the evolution of the road network from 1890 to 2002. The first motor roads were built as feeder roads for the *Uganda Railway*, constructed in 1901 from Mombasa to exploit the resources of Uganda. This permitted British settlers to capture the most fertile land of both the now Central Province and Rift Valley to grow tea and coffee for exports. Those areas _ the *White Highlands* _ had 17.7 times more Europeans per sq km than the rest of Kenya. They were also producing 27.1 times more coffee and 60.7 times more tea, and had 13.0 times more paved roads, per sq km. This concentration of the road network at independence is confirmed by appendix A figure 2, which displays the White Highlands, the main network in 1963 and cities in 1962. Additional roads were then built to connect the main regions and towns of the country for administrative purpose. After independence, the road network was dramatically extended and upgraded, with the objectives of promoting trade (e.g., cash crop exports), tourism and helping rural settlements. In total, the total length of Kenya's road network increased from 12,808 km in 1964 to 22,628 km in 2002. 54% of this expansion was driven by paved roads, 36% by improved roads and 10% by tracks.

3.3 Ethnic Politics

To test whether road placement is driven by political motives, we need to understand in whose hands the power is vested. The general elections of May 1963 between the two main political parties, took place a few months before Kenya's independence and saw KANU (Kenyan African National Union) beat KADU (Kenyan African Democratic Union). Jomo Kenyatta became president and his tribe, the Kikuyus obtained 31.6%

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[16]Barkan and Chege (1989) write (p.439): "Although the P.C.s and D.C.s [provincial and district commissioners] were responsible for the administration of all government policies in their areas, their primary tasks were to maintain law and order, and to facilitate the work of staff posted to each province and district by the ministry which gave them their orders. Policy, in short, was determined at the centre, albeit coordinated in the field by the team led by the P.C."

of the cabinet positions although they represented only 18.8% of the population.[17] In November 1964, KADU merged with KANU in order to assist a consolidated effort towards decolonization. Kenya becomes a *de jure* multi-party democracy, until March 1966 when the Luos creates their own party, KPU (Kenya People's Union). Kenyatta, feeling betrayed, uses the state apparel to pursue his opponents, and the main KPU leader is arrested.[18]. Kenya as a result becomes a single-party autocracy, this transition was typical of African countries during that period (see figure 1). During Kenyatta's tenure, the Kikuyus were said to receive most public investments (Barkan and Chege 1989; Wrong 2009).

When Kenyatta dies of natural causes in August 1978, he is replaced by his vice-president, Daniel Arap Moi, a Kalenjin. Prominent Kikuyu leaders oppose this transition and demand a constitutional change allowing them to elect another Kikuyu president. Moi however secures the support of other tribes and factious Kikuyus from the ruling party, which he rewards with cabinet positions (see Widner 1992, p.110-129). Moi quickly becomes as powerful and authoritarian as Kenyatta, favoring his own people in terms of public spending (Barkan and Chege 1989; Wrong 2009). In December 1992, facing pressure by international donors keen on fighting corruption since the end of the Cold War, he accepts multi-party democracy. This democratic transition is also part of a general movement in Sub-Saharan Africa (see figure 1).

In December 2002, Moi is constitutionally barred from running again, and a coalition of opposition parties wins the elections. Mwai Kibaki, a Kikuyu, becomes president, and it is again argued that Kikuyus are disproportionately favored (Wrong 2009). He is re-elected in December 2007 against a Luo candidate, but Kibaki is accused of having rigged the elections. The first months of 2008 are characterized by ethnic riots, and an unity government is formed in May 2008.

In essence we exploit variation in three leadership changes and within these leadership changes two political institutional changes. There have been three presidents since independence in 1963, Kenyatta (a Kikuyu) from 1963 to 1978, Moi (a Kalenjin) from 1979 to 2002 and Kibaki (a Kikuyu) from 2003 to 2011. Two of these presidents have

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[17]Having been detained from 1953 by the British, Kenyatta had become a hero of independence and a natural candidate for presidency (see Widner 1992, p.51-52). Yet, Kyle (1999) describes how the Luo leader Tom Mboya could have emerged as the first leader of Kenya, thanks to his charisma and close links with the British (see p.69-90).

[18]KPU is banned in November 1969 (see Widner 1992, p.69-70)

experienced a regime change: from multi-party democracy to single-party autocracy (Kenyatta in 1969), and from single-party autocracy to multi-party democracy (Moi in 1992). Leadership changes can be said to have been plausibly exogenous, whether originating from independence, death by natural causes or constitutional rules.[19] Regime changes were also plausibly exogenous, as part of the continent's dynamic or imposed from abroad.[20] We exploit these changes to understand the impact of institutions on ethnic favoritism.

4   Empirical Strategy and Main Results

In this section we describe our empirical strategy to look at whether ethnic favoritism occurs at the district level, we also provide some graphical evidence to corroborate our strategy and display the main empirical results.

4.1   Empirical Strategy

Assuming a population is a good measure of development and how roads should be allocated, we construct a simple index of road favoritism[21]: $Rpop_{d,t}$ is defined as the share of road investments going to district d in year t divided by the population share of district d in 1962.[22] If the index takes a value of one, this indicates that the district receives as much road investments as its population share in the population of Kenya. An index above one indicates that the district is favored in terms of road investments. Our baseline method is to run panel data regressions for districts d and years t of the following form:

$$Rpop_{d,t} = \gamma_d + \alpha_t + \beta Presdist_{d,t} + \delta(Presdist_{d,t} \times Multiparty_t) + \theta_t X_d + u_{d,t} \quad (2)$$

where $Rpop_{d,t}$ is the road favoritism index, which can be constructed using either road development expenditure or paved road building. $Presdist_{d,t}$ is a dummy equal to one if more than 50% of district d's population is from the ethnic group of the president in

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[19]Likewise, an ethnic pattern of power Kikuyu-Kalenjin-Kikuyu emerged.

[20]The fact that the leader did not change, just the regime, is a major reason why studying the Kenyan context is very useful to identify the impact of regime changes.

[21]An old economic history literature uses population as a measure of development (Bairoch 1988) as well as more recent works by Kremer (1993) and Acemoglu *et al.* (2002).

[22]We use the 1962 population census as future population growth could be influenced by ethnic politics.

year t.[23] $Multiparty_t$ is a dummy equal to one if year t is a year during the multi-party era. As such, β captures the effect of being a presidential district on road investments in single-party autocracy, while $\beta + \delta$ captures this effect in multi-party democracy. γ_d and α_t are district and year fixed effects respectively and X_d is a vector of baseline demographic, economic and geographic variables that might affect road placement.[24] Since controlling variables X_d are included in the fixed effects γ_d, we allow their effect θ_t to be time-varying. Lastly, $u_{d,t}$ are individual disturbances clustered at the district level. Our main analysis focuses on road expenditure during 1963-2011.[25]

4.2 Descriptive Evidence

We first display the data we have put together to see if simple graphs indicate that presidents practice ethnic favoritism. Figure 3 shows the evolution of the road network and highlight the Kikuyu and Kalenjin home districts. Kenyatta, a Kikuyu is president between the years 1963 and 1978. When comparing the 1964 and 1979 maps, we see much more paved roads in Kikuyu areas, with most of paved road investments occurring after 1969, during the autocracy era. Moi, a Kalenjin is president between 1979 and 2002. If one compares the 1979 and 2002 maps, we see more roads in the Kalenjin areas and most of these roads were built prior to 1992, during the autocracy era.

Turning to our main measure, road development expenditure, figure 4 plots the index of road favoritism for presidential and non-presidential districts between 1963 and 2011. It is clear that presidential districts receive relatively more roads. The index goes up to almost three in the 1980s, which basically means that a population whose national share is 10% receives almost 30% of the road development budget. This is only possible if the presidential group "taxes" the rest of the population, which we observe by a road favoritism index being below 1. Interestingly, the gap between presidential and non-presidential districts only widens with the transition to autocracy in 1970, and closes down when the country reverts back to democracy in 1993. There are no obvious differences between the earlier and later democratic periods.

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[23]There are 7 Kikuyu presidential districts during the period 1963-1978 and 2003-2011; and there are 6 Kalenjin presidential districts during 1979-2002.

[24]We include baseline controls interacted with a time trend as control variables after independence could also be affected by ethnic politics.

[25]Note, we have 41 districts and 49 years of annual data for road expenditure, hence our sample is 2009 observations. However, when we are using data on paved road construction in 1963-2002, we have 41 districts and 11 years of mapping available, hence 451 observations.

Figure 5 decomposes figure 4 into the respective ethnicity of presidents. This allows us to see whether the findings of figure 4 are driven by a particular ethnic group or time period. We depict the evolution of our road favoritism index for the Kikuyu, Kalenjin and other districts. Results are in line with findings from figure 4. With the transition to single-party autocracy, the Kikuyu index increases, and it decreases as soon as Kenyatta dies (in 1978). The Kalenjin index jumps as soon as Moi takes power and remains above two during the 1980s. With the advent of multi-party democracy in 1992, the Kikuyu and Kalenjin indexes collapse to the benefit of the other tribes.[26] After Kibaki's election in 2002, Kikuyu areas receive more road investments (see 2005-2006) but this effect is short-lived, due to increasing scrutiny from other tribes.

4.3   Results

We now examine the findings from the graphs to see if they hold in a regression framework. Table 1 displays results with the presidential district dummy ($Presdist_{d,t}$) only. Column (1) shows the effect of being a presidential district without controls. In other words, this depicts exactly the graphical analysis in figure 4. In columns (2)-(4), we include baseline controls interacted with a time trend to account for initial factors that might determine the optimal road network. Column (2) includes demography controls (district population, area, urbanization rate), column (3) economic activity (district total earnings and employment in the formal sector, value of cash crop production for export) and column (4) economic geography (being on the main highway Mombasa-Nairobi-Kampala, bordering another country or distance to Nairobi). Column (5) checks the robustness of the results by including district time trends.[27] Being a presidential district in year t increases the road favoritism index by 0.96-1.02 compared to other districts, whether districts that never had any president or districts that were presidential in other years. Our preferred specification is column (4): given that each district starts with a road favoritism index equal to one, the estimation reveals that presidential districts obtain 2.02 times more roads than their population share. As presidential districts represent 15.1% of total population on average in 1963-2011, this means these districts

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[26]Kikuyus, Kalenjins, Luos, Luhyas and Kambas altogether account for around 70% of the population and are on the main economic corridor between Nairobi and Kampala. We check whether Luos, Luhyas and Kambas are more likely than minor tribes to gain from redistribution in democracy, but we do not find any such differences within these other tribes.

[27]As time invariant controlling variables are included in the district fixed effects, there is no need to include both district time trends and controls.

obtained on average around 30.5% of the total road expenditure budget.

We now seek to understand how this ethnic favoritism changes across political regimes by exploiting changes in the political system from democracy-to-autocracy-to-democracy. In Table 2, we include the presidential district dummy ($Presdist_{d,t}$) and its interaction with the multi-party year dummy ($Presdist_{d,t} \times Multiparty_t$) to capture the transitions. Note we also include the multi-party dummy, but the interpretation of its effect is complicated by the presence of the year fixed effects. Specifications in table 2 mirror exactly table 1. Results without controls are reported in column (1), results with controls in columns (2)-(4) and results with district time trends are reported in column (5). Being a presidential district in autocratic years increases the road favoritism index by 1.56-1.74 compared to other districts, while this effect is reduced by 1.08-1.32 in democratic years.[28] Interestingly, one cannot reject the null hypothesis that the effect of democracy is eliminating the effect of being a presidential district, as indicated by the F-test in the last row. These findings are robust to including more controls or district time trends. Given each district starts with a road favoritism index equal to one, presidential districts obtain 2.74 times more roads than their population share in autocratic years (column (4)). This implies that presidential districts have obtained on average 41.4% of the road development expenditure over the period.

In table 3, we check the robustness of our findings. Our main results are reproduced in column (1) and column (2). Our main outcome variable to measure road favoritism has been road expenditure share benchmarked to the population share of that district. Another plausible benchmark to consider is the share of road expenditure going to district d in year t divided by the area share of that district. We find that presidential districts receive 4.05 times more roads than their area share (see column (4)).[29] In columns (5) and (6) - specification in columns (1) and (2) is replicated however this time using our complementary data set on physical road building, in particular paved road construction. As discussed before, our road construction panel is unbalanced in the time dimension due to the lack of frequent maps. Although results are less precisely estimated, they give a similar picture to what we obtain with road expenditure. In autocracy, paved road

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[28]Dropping year fixed effects does not affect the presidential effects but it permits us to interpret the coefficient of the multi-party dummy. We find that the road favoritism index increases by 0.13-0.21 in democracy for each district (results available upon request). This is logical since the president in autocracy cannot favor his own group without taxing other tribes.

[29]We obtain similar results if we standardize by population density (results available upon request).

investments received by presidential districts are 4.71 times their population share (see column (1)). This means they have obtained on average 71.1% of paved road construction over the period. But this effect is strongly reduced in democracy and we cannot reject the hypothesis that democracy is reducing this effect. Why is the autocracy effect larger for paved road construction (3.71, see table 3 - column 6) than for road expenditure (1.74, see table 3 - column 2)? Paved roads are respectively 6.7 and 20 times more expensive than improved and dirt roads (Alexeeva *et al.* 2008), but road expenditure includes all types of roads. If the president only favors his ethnic group with the most expensive type of roads, paved roads, and other districts with improved and dirt roads, the presidential effect will be attenuated for road expenditure. We are unable to directly verify this hypothesis as we cannot separate out road expenditure across the different road types. It is however clear from the previous analysis that the president discriminates groups both in terms of road quantity and quality. In columns (7) and (8), similar specification to column (3) and (4) is replicated to see if results are robust to area share instead of population share. The results are in line with previous findings using both different outcome measures as well as standardizations.

Table 4 presents various additional checks to our main results. In column (1), we replicate our main finding. In column (2), instead of having a discrete measure of whether a district is presidential, we test the district population share of the president's ethnic group. The effects are larger as these are being identified on districts that have a high population share aligned to the president's ethnic group.[30] One could argue that colonization explains the geography of both politics and road investments.[31] We interact our effects with a dummy equal to one if the district is in the White Highlands, but results are similar for districts that are not in the White Highlands (see column (3)). In column (4), we try to see if the president's district of birth receives more road investments than other districts. We interact a district dummy which equals to one if it is the district of birth of the president with a year dummy equal one if it belongs to the multi-party era. We find a larger but not significant effect. Lastly, we investigate in column (5) whether coalition partners receive more road investments. The core issue is to identify coalition partners. We identify this group by using cabinet data and we create

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[30]Recall - 5 out of 7 Kikuyu districts and 3 out of 6 Kalenjin districts have a presidential share higher than 75%.

[31]5 out of 7 Kikuyu districts and 2 out 6 Kalenjin districts belonged to the former White Highlands.

a dummy equal to one if more than 50% of district population is from the second group in the cabinet (the presidential group being the first group). The effects for presidential districts are larger since we now compare them with non-presidential districts that do not belong to the second group. We find that the second group also receives more road investments in autocracy.[32]

In table 5, we breakdown our data into different time periods according to the history of Kenya. This is necessary, as the concern could be that all our findings are driven by a particular leadership period. As before, we regress our main outcome variable, the road favoritism index ($Rpop_{d,t}$) on district dummies which take the value one if more than 50% of the district's population is Kikuyu or Kalenjin, the two presidential ethnic groups. The comparison districts are other non-Kikuyu-non-Kalenjin districts. We find that during the colonial era (column 1), Kalenjin districts received more investments. This is not surprising because parts of the Rift Valley where the Kalenjin and Kikuyu groups reside are located in the former White Highlands, which had been settled by the White farmers. A Kikuyu president only has a positive and significant impact on road investments in Kikuyu districts in the single-party era (column (2.b)). Conversely, a Kalenjin president only has a positive and significant impact on road investments in Kalenjin districts in the single-party (see column (3.a)). Neither presidents are able to mobilize road investments to their ethnic homelands during the multi-party era.

5   Other Results and Channels

We verified our ethnic favoritism results as being robust to various checks. In this section we provide additional results and explore channels through which democracy constrains distributive politics. All the following results are presented in Appendix C. In Appendix C Table 1, we investigate whether the influence of control variables changes over time. For instance, it could be rational to build roads around Nairobi (the capital) first, and later extend road building to the rest of the country. The negative effect of distance to Nairobi would decrease over time and we would fail to capture it by interacting it with a linear time-trend. Hence, we run the same specification but we now also interact control variables with a time trend and its square. Results are unaffected (compare columns

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[32]We find non-significant results of the second group effects for paved roads, despite similar point estimates. This could be due to the fact that we have less observations for this data set. Results are available upon request.

(1) and (2)). We could imagine that Kikuyu and Kalenjin areas have already received a large amount of investments before 1992 and hence the return of new investments is low. We would then confound the effect of the return to democracy and regression to the mean. On the other hand presidents could be insensitive to the economic returns of investments, and decide to upgrade the network (paving, more lanes) in congested areas. We run our baseline specification as before but this time we include the number of years a district has been a presidential district. Results are unaffected (compare columns (1) and (3)). Another typical concern in such empirical work is if observations are spatially correlated, as then estimated standard errors are incorrect. If neighboring observations positively influence each other, estimated standard errors are too low, and we could mistakenly consider a insignificant coefficient as being significant. Our results are robust to clustering standard errors at a higher spatial level, whether at the ethnic group level (13 clusters), the province level (8 clusters), or correcting for spatial autocorrelation using standard methods (see columns (4), (5) and (6)).[33]

Lastly, we make sure that the presidential group does not receive more transfers because it also pays more taxes. We want to ensure the president provides her own group with net benefits. As argued by Padro I Miquel (2007), groups cannot be directly discriminated using taxes. But the state can tax differently sectors associated with specific ethnic groups. In many African countries, a large share of the budget is financed by taxes on the cash crop sector. We thus investigate if the president taxes differently the crop in which her own group is specialized. Using production data at the district level in 1965 for coffee and tea, the two main exports of Kenya, we find that coffee is mainly a Kikuyu crop while tea is mostly a Kalenjin crop.[34] We test whether the president, Kikuyu or Kalenjin, taxes more (or less) her own group rather than the other group, in a democracy versus an autocracy. We regress the yearly taxation rate on a dummy if it is the crop of the president (coffee when Kikuyu, tea when Kalenjin) and its interaction with the multi-party dummy, including time and crop fixed effects and a crop time trend. Results show that there is no effect of being the presidential group on the

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[33]The cluster covariance matrix approach is to cluster observations so that group-level averages are independent. As demonstrated by Bester *et al.* (2011), clustering observations at a higher spatial level can ensure spatial independence. The plug-in HAC covariance matrix approach is to plug-in a covariance matrix estimator that is consistent under heteroskedasticity and autocorrelation of unknown form. This approach models spatial dependence instead of time dependence, and has been popularized by Conley (1999).

[34]69.6% of coffee is produced by Kikuyu districts, and 87.8% of tea by Kalenjin districts.

relative taxation rate of her own group. We cannot reject the hypothesis that presidents are not taxing more (or less) their own crop, whether in autocracy or democracy.[35] Autocrats only discriminate groups using transfers, not taxes, which confirms that road investments are net benefits.[36]

We now explore the results we had found of the second group effects (Table 4 column (5)). These set of results are presented in Appendix C Table 2. Another plausibly definition of the second important group is to use the ethnicity of the vice-president. There have been 11 vice-presidents during the history of Kenya (1964 and 2011) and all of them have been from a different ethnic group than their president. Districts that share the ethnicity of the vice-president receives more roads, but this effect is strongly reduced in democracy (column 2). Instead of considering the second group in the cabinet using all cabinet positions, we restrict our cabinet sample to the president and the top ten positions in terms of investment budget (column 3), or the president and the top ten positions using the hierarchy available in the official government list (column 4). Our second group effects are robust to those definitions. We run the same baseline specification as before except that we have as the variable of interest the cabinet share in year t of the majoritarian ethnic group in the district. We find a positive and significant effect of cabinet share in autocracy, which is then dampened in democracy. But those effects disappears when we include the president and second group effects. This means the cabinet shares do not matter *per se*, but the cabinet rank (president, second group) does (column 5). Lastly, we do not find any effect for the ethnicity or district of birth of the minister in charge for road building (column 6).

5.1 Channels and Discussion of the Results

One possible mechanism that could help in distributing ethnic favoritism is through cabinet appointments. We examine if democracy affects the distribution of cabinet positions across the presidents and other ethnic groups. Our data set consists of the cabinet

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[35]Results not reported here but available upon request. This non-result contradicts the claim made by Kasara 2007 that African presidents have taxed more their own group.

[36]Another issue is whether such results can be generalized to other public goods (Kramon and Posner 2011b). Yet, Barkan and Chege (1989), Franck and Rainer (2010) and Kramon and Posner (2011b) have shown that co-ethnics of the president in Kenya were more likely to receive public investments in their health infrastructure, have some primary education, be literate, have access to water, while no positive (or negative) presidential effect was found for infant mortality, vaccinations and access to electricity. Overall, net benefits for co-ethnics were clearly positive.

share of the 13 ethnic groups for all the election years. We run the same specification as before except we consider the dependent variable as the cabinet share of each ethnic group in year t divided by its population share in 1962. An index higher than one means an ethnic group is receiving more cabinet positions than its ethnic national population share. We then regress this index on a district dummy which equals one if it is the ethnic group of the president, as well as its interaction with the multi-party dummy, including ethnic group, time fixed effects and an ethnic group time trend. Results are presented in Appendix C Table 3. We find that the presidential group receives 1.64 more cabinet positions than its population share (column (1)). When we alternatively use cabinet shares based on top fiscal positions, we find that the presidential group receives 2.28 times more cabinet positions than its population share, which shows the president rewards her people with the best positions (column (2) and (3)).[37] Interestingly, those effects are not modified in democracy. We also find that the second group is not significantly more or less represented in democracy. If anything, the structure of the cabinet (presidential, second and other tribes) does not change with democracy (columns (4), (5) and (6)).

Although we cannot empirically assess which component of democracy (end of repression, enfranchisement, multipartism, media freedom, etc.) drive our results, our work has four major empirical results which we can directly relate to our conceptual framework. First, the president strongly rewards her people in autocracy. Yet, Kenya being a divided country with various small ethnic groups, the presidential group is unlikely to remain in power without retributing another group. The fact that the second group in the cabinet receives some roads, although the effect is smaller and less robust, supports this hypothesis. Second, democracy implies universalism in our context, as each group is then receiving as much road investments as its population share. Third, the fact that the *same* leader behaves differently when they face a multi-party system shows that the positive effects of democracy are not just about the selection of good leaders. Lastly, the structure of the cabinet does not change in democracy and the cabinet share has no impact once we control for the cabinet ranking of ethnic groups (president, second group, other groups). Democracy does not increase political representation for minority groups, but constrains the power associated with the best cabinet positions. The third

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[37]Given an average population share of 15.2% in 1963-2010, this indicates the presidential group obtains 24.9% of cabinet positions and 34.7% of the best cabinet positions.

and fourth findings indicate that democracies offer effective checks and balances which constrain the powers of bad leaders.

6   Conclusion

We assembled a unique dataset on road investments and exploited political variations in Kenya's history to understand the extend of ethnic favoritism. We find that leaders disproportionately favor their own people in autocracy. The presidential group receives 2.7 times more road investments than its population share. This goes up to 4.7 times more if we consider paved road construction. The second group in the cabinet also receives some roads, although the effect is smaller and less robust. Those effects are strongly reduced in democracy, to the profit of the other tribes of the country. The introduction of democracy implies universalism, as a result each group receives as much road investments as its population share.

We argue that this effect goes through democracy shaping incentives. The political representation of minority groups does not increase in democracy, but leaders who hold the best cabinet positions behave differently when they face a multi-party system. This strongly suggests that democracy, even when it is imperfect, offers some effective checks and balances. This must be kept in mind, as Africa engages on the path of democracy.

References

ACEMOGLU, D., JOHNSON, S. and ROBINSON, J. A. (2002). Reversal of fortune: Geography and institutions in the making of the modern world income distribution. *The Quarterly Journal of Economics*, **117** (4), 1231–1294.

— and ROBINSON, J. A. (2000). Why did the west extend the franchise? democracy, inequality, and growth in historical perspective. *The Quarterly Journal of Economics*, **115** (4), 1167–1199.

ALEXEEVA, V., PADAM, G. and QUEIROZ, C. (2008). Contracts and unit costs for enhanced governance in sub-saharan africa. *World Bank Transport Papers*, (21).

BAIROCH, P. (1988). *Cities and Economic Development: Frow the Dawn of History to the Present*. Chicago: The University of Chicago Press.

BANERJEE, A., DUFLO, E. and QIAN, N. (2009). On the road: Access to transportation infrastructure and economic growth in china, unpublished manuscript, Department of Economics, Massachussets Institute of Technology.

— and SOMANATHAN, R. (2007). The political economy of public goods: Some evidence from india. *Journal of Development Economics*, **82** (2), 287–314.

BARKAN, J. D. and CHEGE, M. (1989). Decentralising the state: District focus and the politics of reallocation in kenya. *The Journal of Modern African Studies*, **27** (03), 431–453.

BESLEY, T. and BURGESS, R. (2002). The political economy of government responsiveness: Theory and evidence from india. *The Quarterly Journal of Economics*, **117** (4), 1415–1451.

— and KUDAMATSU, M. (2006). Health and democracy. *American Economic Review*, **96** (2), 313–318.

— and — (2008). Making autocracy work. In E. Helpman (ed.), *Institutions and Economic Performance*, Cambridge MA: Harvard University Press.

— and REYNAL-QUEROL, M. (2011). Do democracies select more educated leaders? *American Political Science Review*, **105** (3).

BESTER, A., CONLEY, T. and HANSEN, C. (2011). Inference with dependent data using cluster covariance estimators. *Journal of Econometrics, Forthcoming.*

BROWN, D. S. and MOBARAK, A. M. (2009). The transforming power of democracy: Regime type and the distribution of electricity. *American Political Science Review*, **103** (02), 193–213.

BUYS, P., DEICHMANN, U. and WHEELER, D. (2010). Road network upgrading and overland trade expansion in sub-saharan africa. *Journal of African Economies*, **19** (3), 399–432.

CHATTOPADHYAY, R. and DUFLO, E. (2004). Women as policy makers: Evidence from a randomized policy experiment in india. *Econometrica*, **72** (5), 1409–1443.

CONLEY, T. G. (1999). Gmm estimation with cross sectional dependence. *Journal of Econometrics*, **92** (1), 1–45.

DONALDSON, D. (2010). *Railroads of the Raj: Estimating the Impact of Transportation Infrastructure.* NBER Working Papers 16487, National Bureau of Economic Research, Inc.

EASTERLY, W. and LEVINE, R. (1997). Africa's growth tragedy: Policies and ethnic divisions. *The Quarterly Journal of Economics*, **112** (4), 1203–50.

FRANCK, R. and RAINER, I. (2010). Does the leader's ethnicity matter? ethnic favoritism, education and health in sub-saharan africa, unpublished manuscript, Department of Economics, Bar Ilan University.

HODLER, R. and RASCHKY, P. A. (2010). *Foreign Aid and Enlightened Leaders.* Working Papers 10.05, Swiss National Bank, Study Center Gerzensee.

JONES, B. F. and OLKEN, B. A. (2005). Do leaders matter? national leadership and growth since world war ii. *The Quarterly Journal of Economics*, **120** (3), 835–864.

KASARA, K. (2007). Tax me if you can: Ethnic geography, democracy, and the taxation of agriculture in africa. *The American Political Science Review*, **101** (1), pp. 159–172.

KHEMANI, S. (2007). Does delegation of fiscal policy to an independent agency make a difference? evidence from intergovernmental transfers in india. *Journal of Development Economics*, **82** (2), 464–484.

KRAMON, E. and POSNER, D. N. (2011a). Education for all? the political economy of primary education in kenya, unpublished manuscript, Department of Political Science, Massachussets Institute of Technology.

— and — (2011b). Who benefits from distributive politics? how the outcome one studies affects the answer one gets. *MIT Political Science Department Research Paper No 2011-9*.

KREMER, M. (1993). Population growth and technological change: One million b.c. to 1990. *The Quarterly Journal of Economics*, **108** (3), 681–716.

KUDAMATSU, M. (2011). Has democratization reduced infant mortality in sub-saharan africa? evidence from micro data. *Journal of the European Economic Association, Forthcoming*.

KYLE, K. (1999). *The Politics of the Independence of Kenya*. Basingstoke, United Kingdom: Palgrave Macmillan.

LIMÃO, N. and VENABLES, A. J. (2001). Infrastructure, geographical disadvantage, transport costs, and trade. *The World Bank Economic Review*, **15** (3), 451–479.

MICHAELS, G. (2008). The effect of trade on the demand for skill: Evidence from the interstate highway system. *The Review of Economics and Statistics*, **90** (4), 683–701.

MILLER, G. (2008). Women's suffrage, political responsiveness, and child survival in american history. *The Quarterly Journal of Economics*, **123** (3), 1287–1327.

MONTALVO, J. G. and REYNAL-QUEROL, M. (2005). Ethnic diversity and economic development. *Journal of Development Economics*, **76** (2), 293–323.

MORJARIA, A. (2011). Electoral politics and deforestation, unpublished manuscript, Harvard Academy.

PADRO I MIQUEL, G. (2007). The control of politicians in divided societies: The politics of fear. *Review of Economic Studies*, **74** (4), 1259–1274.

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PANDE, R. (2003). Can mandated political representation increase policy influence for disadvantaged minorities? theory and evidence from india. *American Economic Review*, **93** (4), 1132–1151.

PERSSON, T., ROLAND, G. and TABELLINI, G. (1997). Separation of powers and political accountability. *The Quarterly Journal of Economics*, **112** (4), 1163–1202.

— and TABELLINI, G. (2006). Democracy and development: The devil in the details. *American Economic Review*, **96** (2), 319–324.

— and — (2007). The growth effect of democracy: Is it heterogenous and how can it be estimated? *NBER Working Papers*, **13150**.

POSNER, D. (2005). *Institutions and Ethnic Politics in Africa*. New York: Cambridge University Press.

RADELET, S. and SACHS, J. (1998). Shipping costs, manufactured exports, and economic growth, presented at the American Economics Association annual meeting.

STRÖMBERG, D. (2004). Radio's impact on public spending. *The Quarterly Journal of Economics*, **119** (1), 189–221.

VAN DE WALLE, N. (2002). *African economies and the politics of permanent crisis, 1979-1999*. Cambridge: Cambridge University Press.

WIDNER, J. (1992). *The Rise of a Party-State in Kenya: From "Harambee!" to "Nyayo!"*. Berkeley: University of California Press.

WRONG, M. (2009). *It's Our Turn to Eat: The Story of a Kenyan Whistle-Blower*. London: Fourth Estate.

Figure 1: Evolution of Political Regimes in Sub-Saharan Africa (1963-2008).
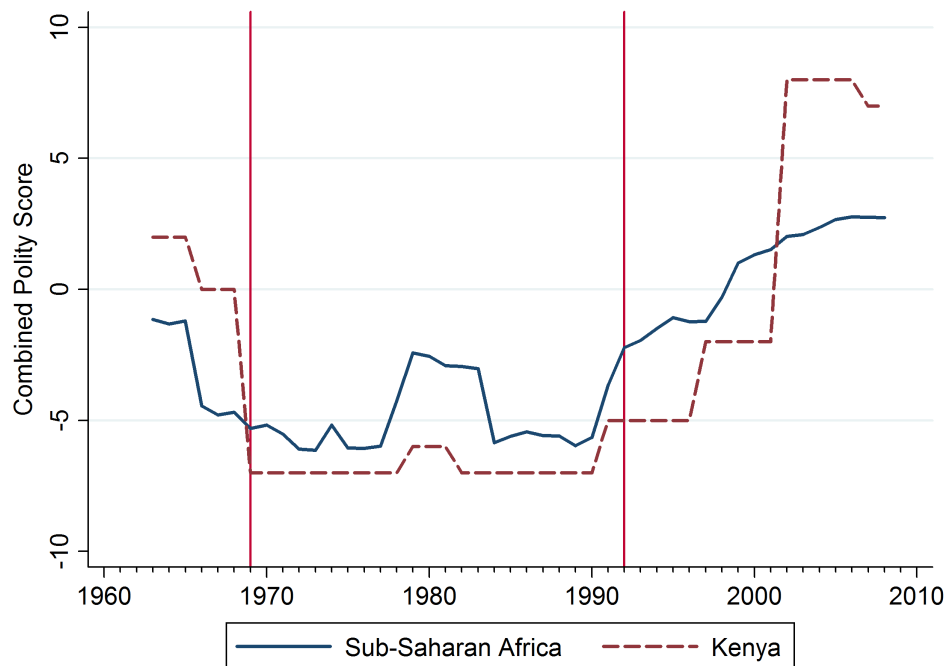
Notes: This figure plots the revised combined polity score for Sub-Saharan Africa (average) and Kenya. Polity IV define three regime categories: *autocracies* (-10 to -6), *anocracies* (-5 to +5) and *democracies* (+6 to +10). The vertical lines represent regime changes in Kenya: 1969 is the transition from multi-party democracy to single-party autocracy, while 1992 is the return of multi-party democracy. Source: authors' calculations and *Polity IV Project, Political Regime Characteristics and Transitions, 1800-2009*. See Data Appendix for data sources.

Figure 2: Evolution of GDP per capita growth in Sub-Saharan Africa (1963-2008).
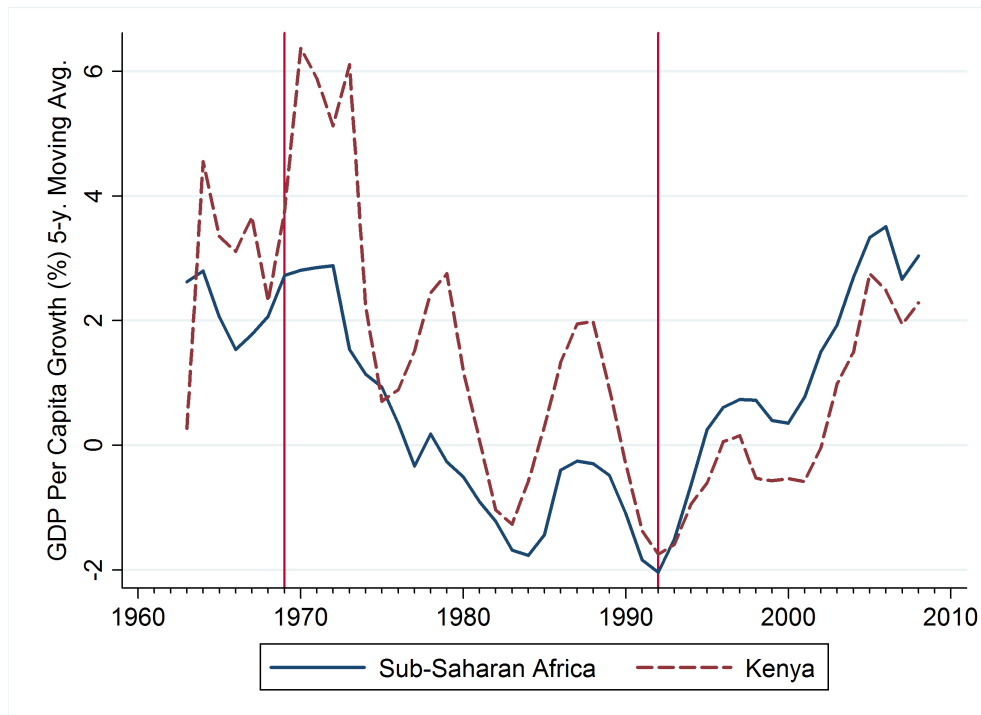
Notes: This figure plots GDP per capita growth (%) for Sub-Saharan Africa (average) and Kenya. We take a 5-year moving average to smooth fluctuations. The vertical lines represent regime changes in Kenya: 1969 is the transition from multi-party democracy to single-party autocracy, while 1992 is the return of multi-party democracy. See Data Appendix for data sources.
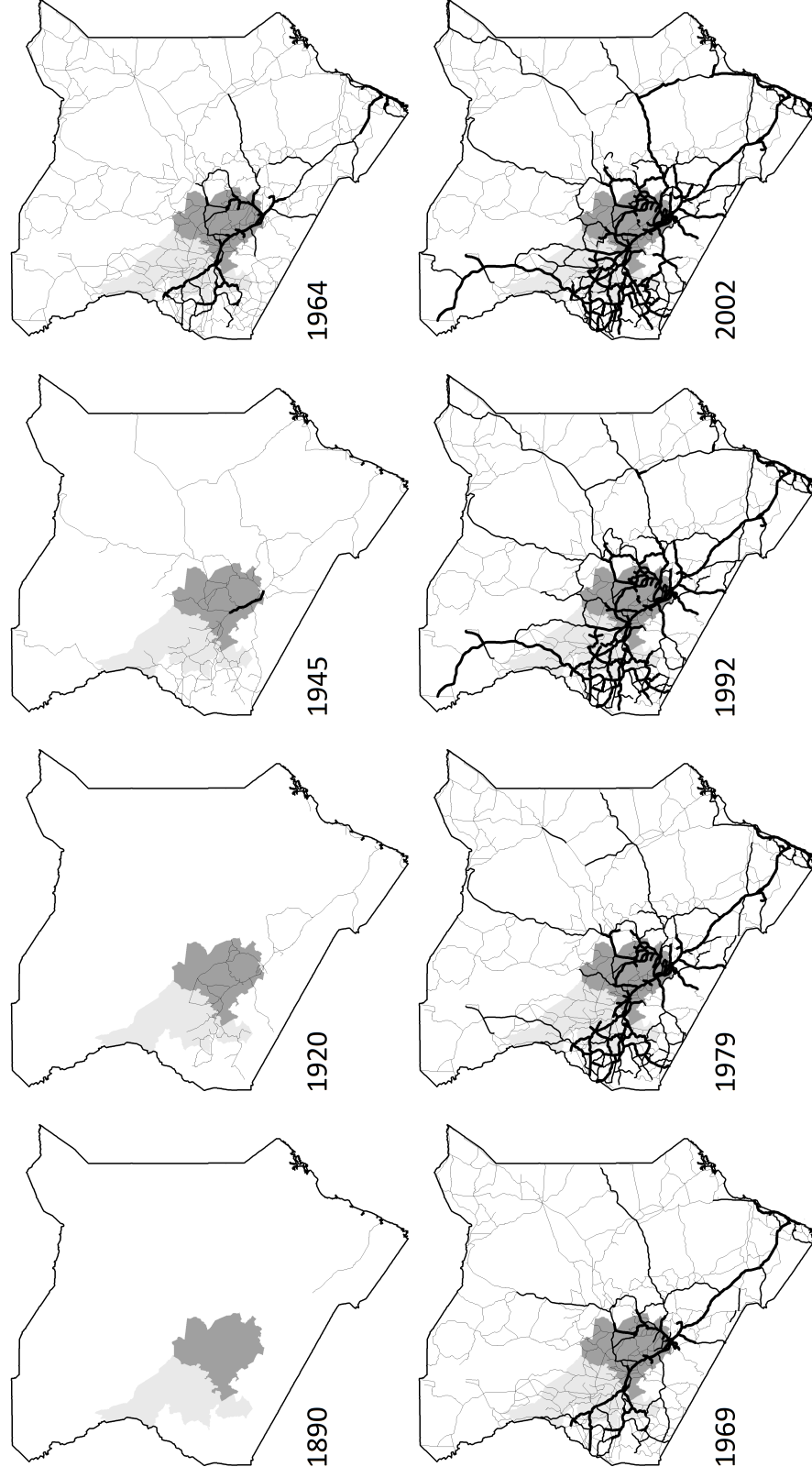
Figure 3: Evolution of Kenya's Road Network for Selected Years (1890-2002)
Paved (Thick Black), Improved (Black) and Dirt (Grey) Roads, and Kikuyu (Grey) and Kalenjin (Light Grey) Areas.

Figure 4: Road Investments and Presidential Districts (1963-2011).
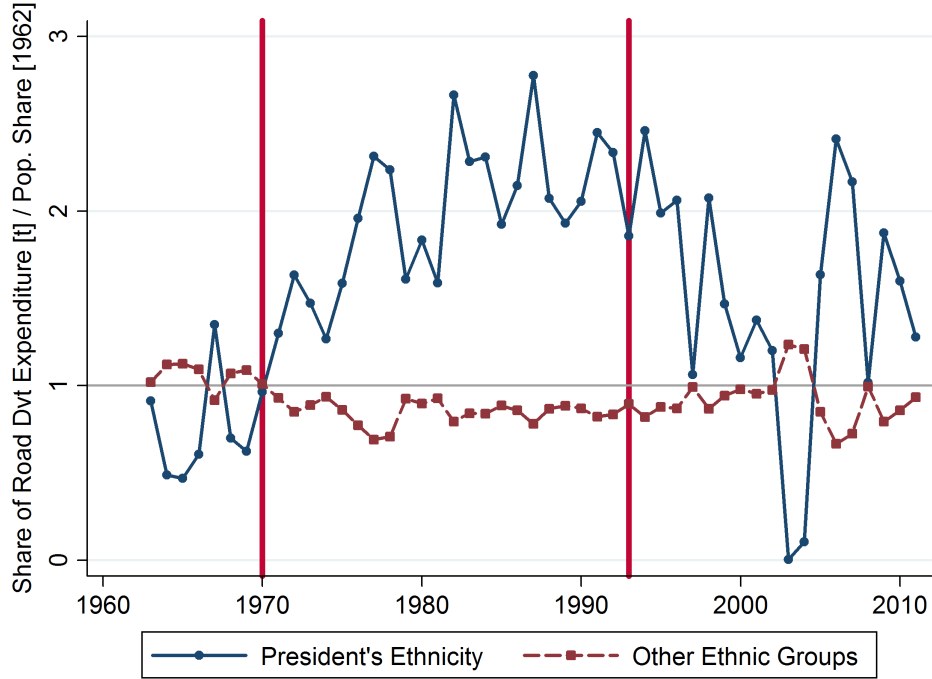
Notes: This figure plots the ratio of the share of road development expenditure in year t to the share of population in 1962 for presidential and non-presidential districts. A district d is defined as presidential if the ethnicity of the president in year t represents more than 50% of its population. The two vertical lines represent political transitions: 1969/1970 is the transition from multi-party democracy to single-party autocracy, while 1992-1993 is the return of multi-party democracy.

Figure 5: Road Investments and Presidential Ethnic Groups (1963-2011).
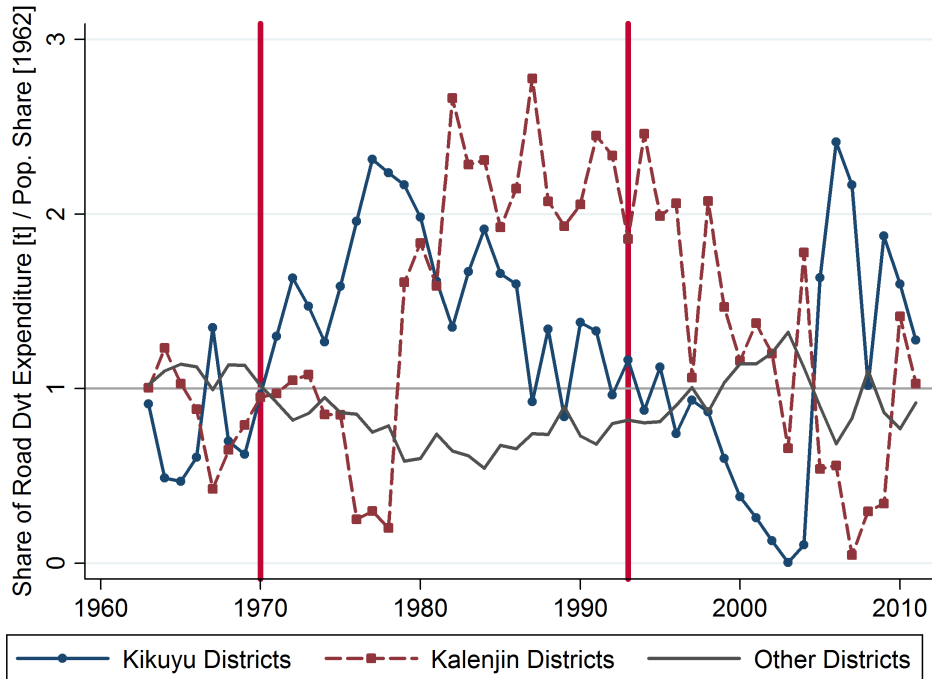
Notes: This figure plots the ratio of the share of road development expenditure in year t to the share of population in 1962 for presidential and non-presidential districts. Presidential districts are defined as in figure 4, except we now disaggregate presidential districts into the different leaders in Kenya's history. The president is Kikuyu in 1963-1978, Kalenjin in 1979-2002 and Kikuyu in 2003-2011. A district is defined as Kikuyu (resp. Kalenjin) if more than 50% of its population is Kikuyu (resp. Kalenjin). The two vertical lines represent political transitions and are defined as in figure 4: 1969-1970 is the transition to autocracy, while 1992-1993 is the return of democracy.

Table 1: Road Investments and Presidential Districts (1963-2011).

Dependent Variable: Share of road development expenditure [d,t] / Population share [d,1962]					
	(1)	(2)	(3)	(4)	(5)
Presidential District Dummy [d,t]	0.97***	0.96***	0.96***	1.02***	0.97**
	(0.36)	(0.35)	(0.35)	(0.35)	(0.38)
Observations	2009	2009	2009	2009	2009
Adj. R-squared	0.10	0.11	0.11	0.11	0.16
District and year fixed effects	Y	Y	Y	Y	Y
(population, area, urbanization rate)*year	N	Y	Y	Y	N
(earnings, employment, cash crops)*year	N	N	Y	Y	N
(main highway, border, dist.Nairobi)*year	N	N	N	Y	N
District time trends	N	N	N	N	Y
No. of districts	41	41	41	41	41

Notes: OLS regressions using data on 41 districts annually from 1963 to 2011. Standard errors corrected for clustering at the district level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 1%. *Presidential District Dummy [d,t]* is a dummy variable whose value is one if more than 50% of the population of district d is from the ethnic group of the president at time t. Columns (2)-(4) include controls interacted with a time trend. These controls are: [i] demographic (district population in 1962, district area in sq km, and urbanization rate in 1962). [ii] economic activity (district total earnings in 1966, employment in the formal sector in 1963 and value of cash crop exports in 1965). [iii] economic geography (a dummy variable whose value is one if any part of the district is on the Mombasa-Nairobi-Kampala corridor, a dummy variable whose value is one if the district borders Uganda or Tanzania, and the Euclidean distance in km to Nairobi). See Data Appendix for data sources and construction of variables.

Table 2: Road Investments, Presidential Districts and Political Regime (1963-2011).

Dependent Variable: Share of road development expenditure [d,t] / Population share [d,1962]					
	(1)	(2)	(3)	(4)	(5)
Presidential District Dummy [d,t]	1.57***	1.62***	1.64***	1.74***	1.56***
	(0.49)	(0.49)	(0.49)	(0.49)	(0.51)
Presidential District Dummy [d,t] x Multi-Party Dummy [t]	-1.11*	-1.24*	-1.27**	-1.32**	-1.08*
	(0.61)	(0.63)	(0.63)	(0.63)	(0.59)
Observations	2009	2009	2009	2009	2009
Adj. R-squared	0.11	0.12	0.11	0.12	0.17
District and year fixed effects	Y	Y	Y	Y	Y
(population, area, urbanization rate)*year	N	Y	Y	Y	N
(earnings, employment, cash crops)*year	N	N	Y	Y	N
(main highway, border, dist.Nairobi)*year	N	N	N	Y	N
District time trends	N	N	N	N	Y
No. of districts	41	41	41	41	41
F-test [p-value]	1.07	0.76	0.73	0.90	1.22
President + President x Multi-Party = 0	[0.31]	[0.39]	[0.40]	[0.35]	[0.28]

Notes: OLS regressions using data on 41 districts annually from 1963 to 2011. Standard errors corrected for clustering at the district level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 1%. *Presidential District Dummy [d,t]* is a dummy variable whose value is one if more than 50% of the population of district d is from the ethnic group of the president at time t. *Multi-Party Dummy [t]* is a dummy variable whose value is one if there is multi-partyism in year t. The F-test is used to test the null hypothesis of joint equality between a presidential district and a non-presidential district during multi-party. Columns (2)-(4) include controls interacted with a time trend. These controls are: [i] demographic (district population in 1962, district area in sq km, and urbanization rate in 1962). [ii] economic activity (district total earnings in 1966, employment in the formal sector in 1963 and value of cash crop exports in 1965). [iii] economic geography (a dummy variable whose value is one if any part of the district is on the Mombasa-Nairobi-Kampala corridor, a dummy variable whose value is one if the district borders Uganda or Tanzania, and the Euclidean distance in km to Nairobi). See Data Appendix for data sources and construction of variables. See Data Appendix for data sources and construction of variables.

Table 3: Robustness Checks: Alternative Dependent Variables (1963-2011).

Dependent Variable:	Share of road dvt expenditure [d,t] / Pop. share [d,1962]		Share of road dvt expenditure [d,t] / Area share [d]		Share of paved road construction [d,t] / Pop. share [d,1962]		Share of paved road construction [d,t] / Area share [d]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Presidential District Dummy [d,t]	1.02*** [0.35]	1.74*** [0.49]	1.84** [0.90]	3.05*** [0.99]	3.07* [1.66]	3.71** [1.70]	4.04** [1.53]	5.19*** [1.62]
Presidential District Dummy [d,t] x Multi-Party Dummy [t]		-1.32** [0.63]		-2.22* [1.29]		-2.28* [1.29]		-4.10* [2.24]
Observations	2009	2009	2009	2009	451	451	451	451
Adj. R-squared	0.11	0.12	0.38	0.39	0.01	0.01	0.13	0.13
District and year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
(population, area, urbanization rate)*year	Y	Y	Y	Y	Y	Y	Y	Y
(earnings, employment, cash crops)*year	Y	Y	Y	Y	Y	Y	Y	Y
(main highway, border, dist.Nairobi)*year	Y	Y	Y	Y	Y	Y	Y	Y
District time trends	N	N	N	N	N	N	N	N
No. of districts	41	41	41	41	41	41	41	41
F-test [*p-value*] President + President * Multi-Party = 0		0.90 [0.35]		0.52 [0.48]		0.57 [0.47]		0.23 [0.63]

Notes: Columns (1)-(4): OLS regressions using expenditure data on 41 districts annually from 1963 to 2011. Columns (5)-(8): OLS regressions using maps on 41 districts from 1963 to 2002. Maps are not available annually, hence the change in the number of observations. Standard errors corrected for clustering at the district level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 10%. *Presidential District Dummy [d,t]* is a dummy variable whose value is one if more than 50% of the population of district d is from the ethnic group of the president at time t. *Multi-Party Dummy [t]* is a dummy variable whose value is one if there is multi-partyism in year t. The F-test is used to test the null hypothesis of joint equality between a presidential district and a non-presidential district during multi-party. Columns (1)-(8) include controls interacted with a time trend. These controls are: [i] demographic (district population in 1962, district area in sq km, and urbanization rate in 1962). [ii] economic activity (district total earnings in 1966, employment in the formal sector in 1963 and value of cash crop exports in 1965). [iii] economic geography (a dummy variable whose value is one if any part of the district is on the Mombasa-Nairobi-Kampala corridor, a dummy variable whose value is one if the district borders Uganda or Tanzania, and the Euclidean distance in km to Nairobi). See Data Appendix for data sources and construction of variables.

Table 4: Additional Robustness Checks (1963-2011).

Dep.Variable: Share of road development expenditure [d,t] / Population share [d,1962]

	(1)	(2)	(3)	(4)	(5)
Presidential District Dummy [d,t]	1.74***		2.10***	1.60***	2.34***
	(0.49)		(0.77)	(0.50)	(0.58)
Presidential District Dummy [d,t] x Multi-Party Dummy [t]	-1.32**		-1.73*	-1.13	-1.45**
	(0.63)		(0.86)	(0.69)	(0.64)
Presidential Share [d,t]		2.30***			
		(0.56)			
Presidential Share [d,t] x Multi-Party Dummy [t]		-1.90***			
		(0.66)			
Presidential District Dummy [d,t] x White Highlands [d]			-0.74		
			(0.90)		
Presidential District Dummy [d,t] x White Highlands [d] x Multi-Party Dummy [t]			0.8		
			(1.07)		
President District of Birth [d,t]				0.9	
				(1.22)	
President District of Birth [d,t] x Multi-Party Dummy [t]				-1.3	
				(1.05)	
Second Cabinet Group [d,t]					1.71***
					(0.55)
Second Cabinet Group [d,t] x Multi-Party Dummy [t]					-1.92**
					(0.82)
Observations	2009	2009	2009	2009	2009
Adj. R-squared	0.12	0.12	0.12	0.12	0.13
District and year fixed effects	Y	Y	Y	Y	Y
(population, area, urbanization rate)*year	Y	Y	Y	Y	Y
(earnings, employment, cash crops)*year	Y	Y	Y	Y	Y
(main highway, border, dist.Nairobi)*year	Y	Y	Y	Y	Y
District time trends	N	N	N	N	N
No. of districts	41	41	41	41	41
F-test [p-value]	0.90	0.97	1.53	0.90	4.06*
President + President * Multi-Party = 0	[0.35]	[0.33]	[0.22]	[0.35]	[0.05]

Notes: OLS regressions using data on 41 districts annually from 1963 to 2011. Standard errors corrected for clustering at the district level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 1%. *Presidential District Dummy [d,t]* is a dummy variable whose value is one if more than 50% of the population of district d is from the ethnic group of the president at time t. *Multi-Party Dummy [t]* is a dummy variable whose value is one if there is multi-partyism in year t. *Presidential Share [d,t]* is the population share of the ethnic group of the president in district d at time t. *White Highlands [d]* is a district dummy equal to one if more than 50% of district area was considered as "White Highlands" during colonization. *President District of Birth [d,t]* is a is a dummy variable whose value is equal to one if district d is the president's district of birth at time t. *Second Cabinet Group [d,t]* is a dummy variable whose value is one if more than 50% of the population of the district is from the second largest ethnic group in the cabinet after the president's group at time t. The F-test is used to test the null hypothesis of joint equality between a presidential district and a non-presidential district during multi-party. Columns (1)-(5) include controls interacted with a time trend. These controls are the same as in tables (1)-(3). See Data Appendix for data sources and construction of variables.

Table 5: Road Investments during Kenya's History (1901-2011).

	COLONIAL	KENYATTA		MOI		KIBAKI
Dependent Variable: Share of road development expenditure [d,t] / Population share [d,1962]						
Leader:	COLONIAL	KENYATTA		MOI		KIBAKI
Regime:		Multi-Party	Single-Party	Single-Party	Multi-Party	Multi-Party
	1901-1962	1963-1969	1970-1978	1979-1992	1993-2002	2003-2011
	(1)	(2.a)	(2.b)	(3.a)	(3.b)	(4)
Kikuyu District Dummy [d,1962]	0.74	-0.44	0.96**	0.66	-0.88	0.00
	(0.52)	(0.39)	(0.39)	(0.49)	(0.57)	(0.63)
Kalenjin District Dummy [d,1962]	1.83**	-0.57	-0.17	1.88***	0.70	-0.60
	(0.90)	(0.41)	(0.32)	(0.66)	(1.11)	(0.57)
Observations	2419	287	369	574	410	369
Adj. R-squared	0.01	0.01	0.03	0.05	0.01	0.01
Year fixed effects	Y	Y	Y	Y	Y	Y
District fixed effects	–	–	–	–	–	–
Controls	N	N	N	N	N	N
District time trends	N	N	N	N	N	N
No. of districts	41	41	41	41	41	41
F-test [p-value]	1.14	0.15	6.92**	3.13*	2.26	0.99
Kikuyu District - Kalenjin District = 0	[0.29]	[0.70]	[0.01]	[0.08]	[0.14]	[0.33]

Notes: OLS regressions using data on 41 districts annually from 1963 to 2011. Standard errors corrected for clustering at the district level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 1%. *Kikuyu (Kalenjin) District Dummy [d,1962]* is a dummy variable whose value is one if more than 50% of the population of district d is Kikuyu (Kalenjin) according to the 1962 population census. Non-Kikuyu and non-Kalenjin districts are the omitted group. The F-test is used to test the null hypothesis of joint equality between a Kikuyu district and a Kalenjin district. See Data Appendix for data sources and construction of variables.

Appendices

A Data Appendix

The data used in this paper comes from a wide variety of sources. Summary statistics for the variables we construct are reported in Appendix A Table 1.

Spatial Units:
The data we assemble cover the 41 districts of Kenya, for the period 1889 to 2011. We fix district boundaries according to the administrative map at independence, in 1963, and follow these units across the period 1963-2011.[1] Kenya is administratively divided into provinces, districts, location and sub-locations.

Road Expenditure Data:
We assemble a road development expenditure dataset for 41 districts, annually from 1901 to 2011. In general, road expenditure data can be disaggregated into *development expenditure* (which are new investments) and *recurrent expenditures* (primarily maintenance). The Kenyan administrative records only allow to track road development expenditure at the district level. Unfortunately, recurrent road expenditure, though reported annually, is only available at the national level. To construct this database of road investments, we use various annual reports which exhaustively list individual road projects (e.g., from town A to town B through town C) and their related costs.[2] When a road project spans more than one district, we use GIS to understand the layout of the affected road and how many kilometers are affected within each district. We then decompose expenditure across the affected districts assuming an equal distribution of costs along the total length of this layout.[3] This exercise allows us to have a panel data set of road expenditure for

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[1]District boundaries were subsequently redrawn after 1992. However, these could be driven by political motives, e.g. gerry-meandering.

[2]The reports we use for the pre-independence period are: *Annual Colonial Reports of the Kenya Colony* 1897-1930, *Blue Books of the Kenya Colony* 1912-1916, 1926-1938 and 1945-1946, *Public Works Department Reports of the Kenya Colony* 1913, 1923, 1926-1938, 1945-1956, *Financial Reports of the Kenya Colony* 1922-1960, *Development and Reconstruction Reports of the Kenya Colony* 1946-1952, *Road Authority Reports of the Kenya Colony* 1949-1962, *Native Affairs Reports of the Kenya Colony* 1924-1947. The reports we use for the post-independence period are: *Development Estimates of Kenya* 1963-2011, *Physical Infrastructure Sector MTEF Report of Kenya* 2007/2008-2009/2010 and 2009/2010-2011/2012. We then use *Development Estimates of Kenya* 1963-2011 and *Recurrent Estimates of Kenya* 1963-2011 to compare the annual aggregate amounts spent on road investments to: (i) the total investment budget, (ii) investments in other public goods (education, health and water development), and (iii) the road maintenance budget. We also estimate the share of road expenditure provided by foreign aid.

[3]The information soon after independence, for the period 1963-1973, is recorded as expenditure on road programs, which are collections of individual road projects. We use various supplementary documents to understand how the total cost of these road programs could be

41 districts annually from 1901 to 2001.[4] We have 41 districts and 111 years, hence 4551 observations.

Road Building Data:

We create a district road building data by putting together a novel GIS database of the Kenyan road network, at regular intervals for the period 1889 to 2002.[5] To construct the GIS database, we initially start with a GIS database containing contemporary roads from *Global GIS*. We then use various sets of historical maps and reports to recreate the evolution of the GIS network backwards in time.[6] For the period 1889 to 2002, we are able to distinguish between two categories of road type - paved and unpaved roads. For the more recent period 1955-2002, we are also able to distinguish a further type of road - improved (laterite) roads.[7] No updated road map of Kenya exists post-2002. The last Government of Kenya map was completed in 2002, and no commercial road maps have been updated after that year.[8] Using GIS tools, we then superpose our district boundaries on the road network and create a *district-year* panel data set of the total length (km) of paved roads, improved and dirt roads.

Cabinet Data:

We construct a panel data set of all the cabinet members for all the election years in the period 1963 to 2011. There are 13 such cabinet appointments. We assemble several

disaggregated between individual road projects and then mapped onto the GIS database for analysis at the district level. These documents are the 5-year *Development Plan of Kenya* 1964-1970, 1966-1970, 1970-1974 and 1974-1978, and a series of *Road Program Operational Reports* directly available on the website of the World Bank: http://www.worldbank.org/projects. During the initial years, most of the road programs were funded by the World Bank, we obtained for each project an *Operational Report* which details out each road program and the cost for each individual road project.

[4]Road expenditure is reported in British Pounds before 1920, East African Pounds for the period 1921-1966, Kenyan Pounds for the period 1967-1999, and Kenya Shillings for the period 2000 onwards. Using Officer (2009) and IMF (2011), we convert these amounts to current US$ and use a deflator series of the US$ to obtain those amounts in constant 2000$.

[5]We have annual data for the period 1889-1961, and for the following years - 1964, 1967, 1969, 1972, 1974, 1979, 1981, 1987, 1989, 1992 and 2002.

[6]The maps we use are: *Map for the Colony of Kenya* 1959, *Michelin National Map for Central and South Africa* 1961, 1964, 1967, 1969, 1972, 1974, 1979, 1981, 1984, 1987, 1989 and 1992, and *Survey of Kenya Map* 1948, 1955, 1967, 1972, 1991 and 2002. The reports we use are as listed in footnote 2. We check our methodology by comparing the evolution of the network provided by Soja (1968).

[7]Note there were no paved roads in Kenya prior to 1945. The colonial reports do not distinguish between improved and dirt roads before 1955. Michelin maps for the period 1961-1992 are consistent across time and display the quality of each road using a consistent classification. We cross-check the Michelin maps with the Government of Kenya maps (known as *Survey of Kenya Maps*). Lastly, we use the 2002 *Survey of Kenya Map* to recreate the paved, improved and dirt network in 2002.

[8]A discussion with various road mapping agencies, e.g. Michelin, confirmed that most African countries have stopped providing road mapping information from the early-1990s.

characteristics of the cabinet members - their ministerial portfolio, ethnicity and district of birth. This dataset allows us to track the evolution of each ethnic group's representation in the politics of Kenya. We use various data sources to construct the cabinet panel database. [9] We then learn the district of birth for each cabinet member from records kept at the Kenyan Parliamentary Library. Finally, the ethnicity of prominent cabinet members is well-known, while the information for the less prominent politicians is obtained in several ways. We use third-party sources: (i) the *Weekly Review* magazine in the Moi period would often list out the cabinet and ethnicity of cabinet members, (ii) we cross checked our findings with Hornsby (1985), Ahluwalia (1996) and Hornsby (2010), and (iii) the direct help of several journalists from top dailies in Kenya.[10] The construction of this database allows us to calculate the share of each ethnic group in the cabinet. Appendix A Table 2 tabulates the ethnic shares across the different cabinet years. The *Development Estimates of Kenya* allows us to rank annually the different ministerial portfolios in terms of their budgets. We calculate other cabinet share measures: (i) for each ethnic group we use the president and the top ten fiscal positions, and (ii) we create from the same source the listing of cabinet appointments (president, vice-president/prime minister, minister of finance, minister of defence, etc.). We then recalculate cabinet shares for each ethnic group using the president and the top ten hierarchical positions according to the list presented.[11]

Ethnic Census Data:
We use the 1962 population census of Kenya to obtain our ethnic composition of districts. The 1962 ethnic census is tabulated at the location level (which is one level below the district).[12] We use GIS to transform the 1962 ethnic data at the location level to district level data using the district boundaries (41) of 1963. We aggregate the 41 tribes into an aggregated classification of 13 ethnic groups, which is standard when analyzing Kenyan politics: Kikuyu, Kalenjin, Kamba, Luo, Luhya, Maasai, Coastal, Embu, Kisii, Meru, Somali, Turkana-Samburu and Other (Other Africans, Arabs, Asians, Non-Africans). Appendix A Figure 1 displays the main ethnic groups for each location (168) in 1962 and district boundaries (41) at independence, in 1963. This confirms that district boundaries were created to isolate ethnic groups. We tabulate the ethnic profile of Kenya's population across all the census years (1948, 1962, 1969, 1979, 1989 and 2009).[13] Appendix A Table 3 reports the national ethnic shares, and reveals the stability of ethnic groups across time.

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[9]We use the following publications: *The National Assembly: List of Members*, *Organization of the Government of Kenya*, and *Encyclopedia of Sub-Sahara Africa: Kenya.*

[10]We are grateful to Charles Hornsby for his assistance at various stages and to Ann Mbugua for her help in Kenya.

[11]Tables not shown but available upon request.

[12]There are 168 locations.

[13]Unfortunately, ethnic data from the 1999 census was never made public. Instead, we use as a proxy the ethnic distribution available in the report of the nationally representative 2003 *Kenya Demographic and Health Survey.*

Political Economy:

Presidential District Dummy [d,t] is a dummy variable whose value is one if more than 50% of the district d population is from the ethnic group of the president in year t. The ethnic group of the president is Kikuyu (Kenyatta) in 1963-1978, Kalenjin (Moi) in 1979-2002 and Kikuyu (Kibaki) again in 2003-2011. *Multi-Party Dummy [t]* is dummy variable whose value is one if there is a multi-party democracy in year t. The multi-party years in Kenya were 1963-1969 and 1993-2011 in our sample. [14] *Kikuyu District Dummy [d]* (resp. *Kalenjin District Dummy [d]*) is a dummy variable whose value is one if more than 50% of the population of district d is Kikuyu (resp. Kalenjin). *Presidential Share [d,t]* is the share of the president's ethnic group in district d at time t. *White Highlands [d]* is a dummy equal to one if more than 50% of district area was considered as "White Highlands". The White Highlands was a demarcated area set aside by the Kenya Colony for White settlers.[15] *President District of Birth [d,t]* is a dummy equal to one is district d is the president's district of birth at time t. [16]. *Second Cabinet Group [d,t]* is a dummy equal to one if more than 50% of the population of the district is from the second largest ethnic group in the cabinet after the president's group at time t.[17] There is no clear coalition member in the period 1970-1978 (7 ethnic groups share the second position in this period) and there are two ethnic groups in the period 1993-1997.[18] Lastly, we create *Road Minister District of Birth [d,t]*, a dummy variable whose value is one if district d is the district of birth of the road minister.[19]

Control Variables:

We use various documents to reconstruct a set of socioeconomic and demographic vari-

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[14]Expenditure data is budgeted for year t, which runs from June $[t-1]$ to June $[t]$. As a result, Moi's impact has to be considered from 1979 (June 1978-June 1979) and Kibaki's impact from 2003 (June 2002-June 2003). Similarly, the transition to autocracy in November 1969 is effective from 1970 (June 1969-June 1970) and the transition to democracy in December 1992 is effective from 1993 (June 1992-June 1993). We adapt the political economy variables to reflect this when we use paved road construction as an outcome to ensure we are consistent.

[15]We digitize a 1958 land classification map from the *Survey of Kenya* to create this dummy.

[16]Kenyatta (for the period 1963-1978) was born in Kiambu district, Moi (for the period 1979-2002) was born in Baringo district, and Kibaki (for the period 2003-2011) was born in Nyeri district.

[17]The second cabinet ethnic group are the Luos for the period 1963-1969, the Kikuyus for the period 1979-2002, the Kambas for the period 1993-1997 and the Luhyas for the period 1993 to 2011.

[18]We obtain a rather similar ethnic chronology of the second group when considering the top fiscal positions, the top hierarchical positions or the ethnicity of the vice-president. Besides, there are no years for which the second group is not identified using those alternative definitions. We construct alternative measures of the second cabinet group based on those three different definitions: *Vice-Presidential District Dummy [d,t]*, *Second Cabinet Group [d,t] Fiscal* and *Second Cabinet Group [d,t] Hierarchical*. We also create *Cabinet Share of Maj. Ethnic Group [d,t]* which is the cabinet share at time t of the majoritarian ethnic group in district d.

[19]We use different measures of having access to the road ministry, by also looking at the ethnicity of the road minister, and the district of birth and ethnicity of the public works minister.

ables at the district level. We obtain district population and urbanization rates from the reports of the decadal *Population and Housing Censuses of Kenya* (1962, 1969, 1979, 1989 and 1999). District area (sq km) is estimated using GIS tools on the basis of 1963 administrative boundaries. We use the annual *Statistical Abstracts of Kenya* to reconstruct total district employment and total district earnings (in 2000$) in the formal sector.[20] The former variable is available annually from 1963 to 2006, while the latter variable is available annually from 1966 to 2006. The *Development Plan of Kenya* 1964-1970 reports cash crop production (coffee, tea and sisal) at the district level for the year 1964-1965. We then use the 1965 export price in 2000$ (FAO 2011) to calculate the district total value of cash crop exports in 1965.[21] We use GIS to create: (i) a dummy variable whose value is one if any part of the district is on the Mombasa-Nairobi-Kampala corridor, (ii) a dummy variable whose value is one if the district borders Uganda or Tanzania, (iii) a variable capturing the Euclidian distance (in km) of each district centroid to Nairobi. We use a digitized land classification map to estimate the share of district area that was part of the former White Highlands. Appendix A Figure 2 displays the main road network at independence and the White Highlands. It confirms that most of the colonial road network was located in the White Highlands.

Macroeconomic and Democracy Data:
Data on political regimes in Sub-Saharan African countries and Kenya is obtained from the *Polity IV Project*, a well-known database on political regime characteristics and transitions. We use the "Combined Polity Score" which ranges in value from -10 (hereditary monarchy) to +10 (consolidated democracy). Polity IV recommends to follow this classification: *autocracies* (-10 to -6), *anocracies* (-5 to +5) and *democracies* (+6 to +10). The average combined policy score for Sub-Saharan Africa is calculated using individual polity scores and the population of each country as weights (obtained from WB (2011)). We also use WB (2011) to get data on GDP per capita growth in Sub-Saharan Africa and Kenya.

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[20]The data is reported in Kenyan Shillings. Using Officer (2009) and IMF (2011), we convert those amounts to current US$ and deflate them to get constant 2000$.

[21]We use this data to identify the cash crop specialization of each presidential group. Data on distortions to agricultural incentives for each crop-year is obtained from Anderson and Valenzuela (2008).

References

AHLUWALIA, P. (1996): "Post Colonialism and the Politics of Kenya," New York: Nova Science.

ANDERSON, K., AND E. VALENZUELA (2008): *Estimates of Global Distortions to Agricultural Incentives, 1955 to 2007*. Washington DC: World Bank.

FAO (2011): *FAOSTAT*. Rome: Food and Agricultural Organization.

HORNSBY, C. (1985): "The Member of Parliament in Kenya, 1969-1983: the Election, Background and Position of the Representative and the Implications for his Role in the One-Party State," Unpublished thesis, Oxford University.

——— (2010): "Database of Kenyan Members of Parliament," Unpublished, Personal Communication.

IMF (2011): *International Financial Statistics*. Washington D.C.: International Monetary Fund.

OFFICER, L. (2009): *Exchange Rates Between the United States Dollar and Forty-one Currencies*. MeasuringWorth Project.

SOJA, E. (1968): "The Geography of Modernization in Kenya; a Spatial Analysis of Social, Economic, and Political Change," Syracuse geographical series no. 2.

WB (2011): *Word Development Indicators*. Washington D.C.: World Bank.

Appendix A Figure 1: Ethnic Groups and Administrative Boundaries.

Main ethnic group
Location (1962)

- None
- Kikuyu
- Kalenjin
- Kamba
- Luo
- Luhya
- Maasai
- Coastal
- Embu
- Kisii
- Meru
- Somali
- Turkana-Samburu
- Other

District Boundaries (as of 1962)

Location Boundaries (as of 1963)
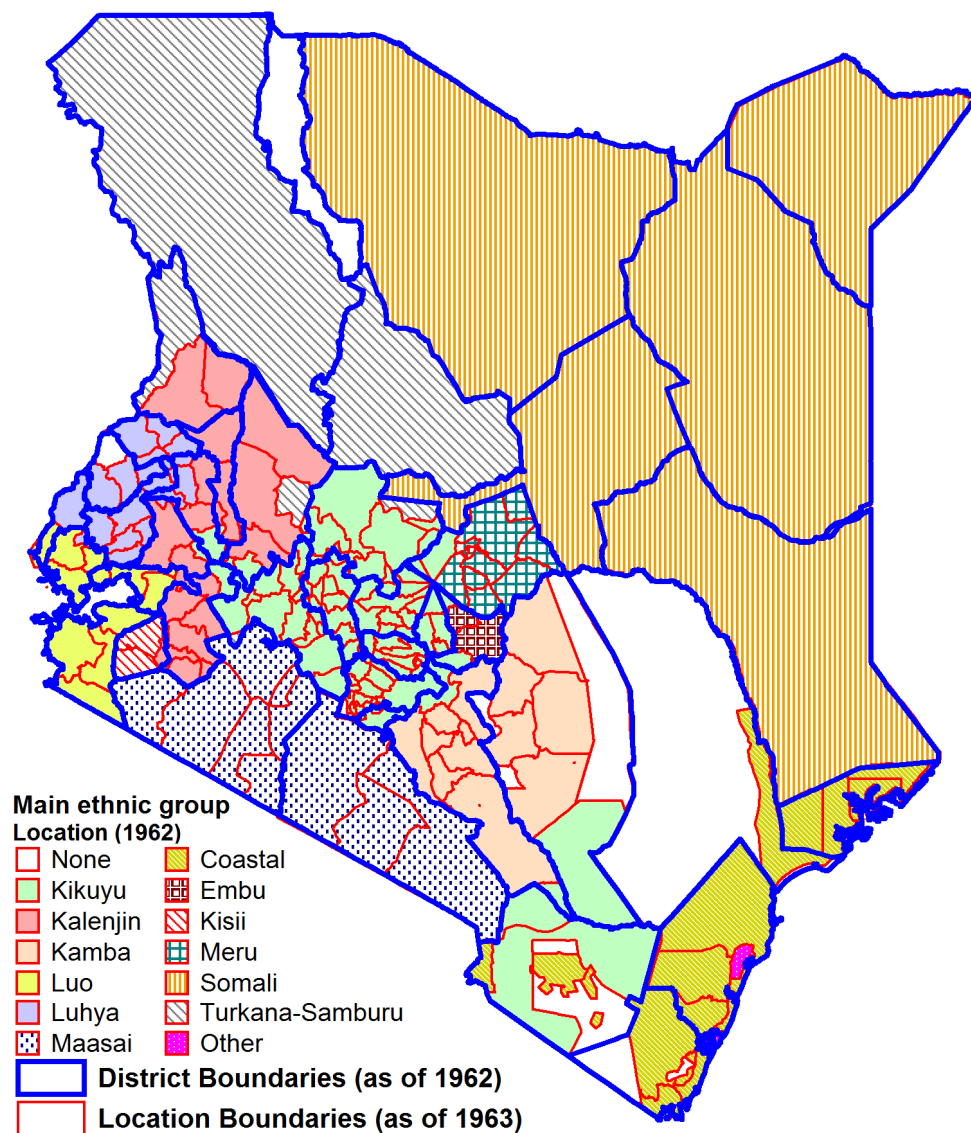
Notes: This figure shows the main ethnic group according to location boundaries (168) using the 1962 population census. We then superpose district boundaries at the time of independence in 1963. See Data Appendix for data sources.

Appendix A Figure 2: Main Road Network and the White Highlands.

Legend:
- Improved Road (1963)
- Paved Road (1963)
- White Highlands
- Town in 1962
- Nairobi
- District Boundaries (as of 1962)
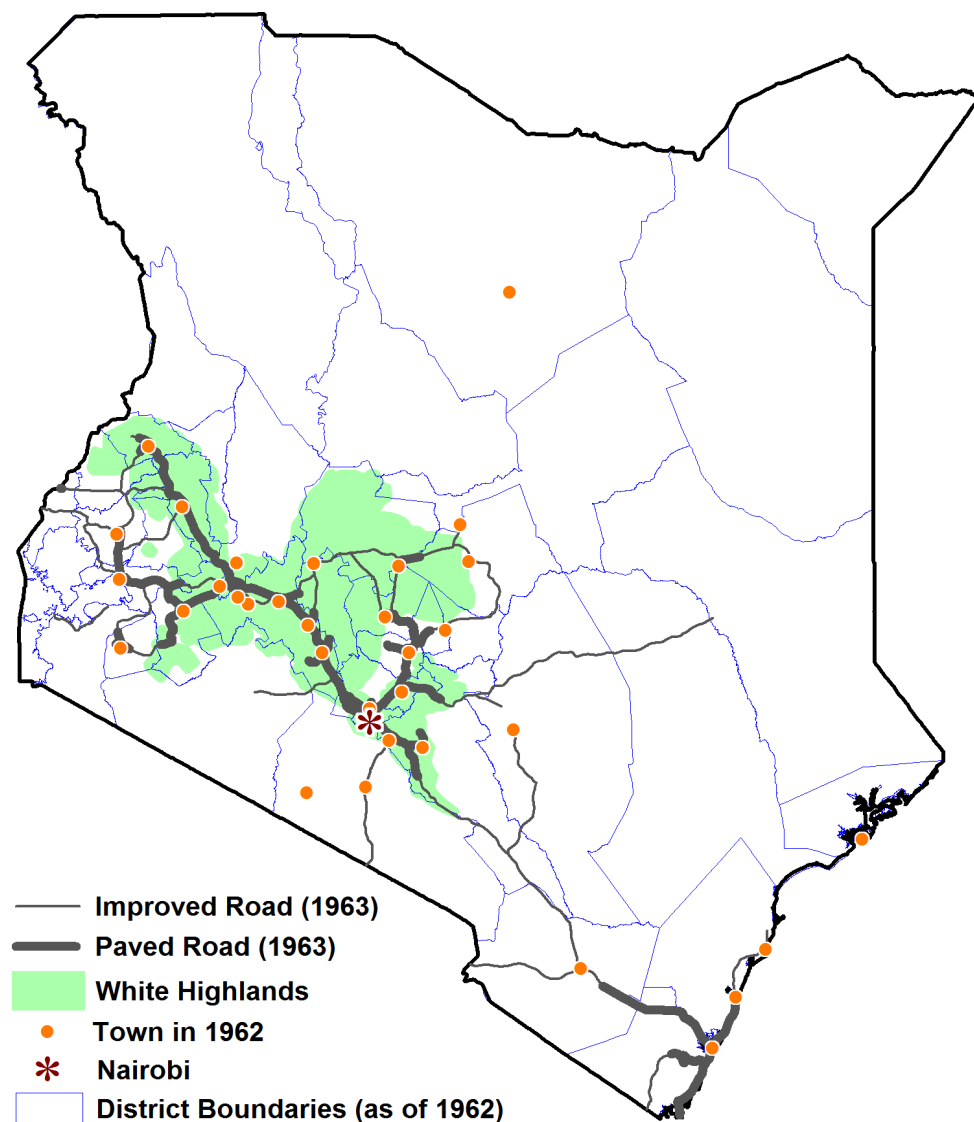
Notes: This figure show paved and improved roads at the time of independence in 1963, towns ($\geq$ 2,000 inh.) and the White Highlands, an area demarcated by the Kenyan Colony for White Settlement. We superpose district boundaries in 1963. See Data Appendix for data sources.

Appendix A Table 1: Sample Descriptives

	Mean	Std.Dev.	Obs
Panel A: Dependent Variables			
Share of Road Dvt Expenditure [d,t] / Pop. Share [d,1962]	1.25	2.80	2009
Share of Road Dvt Expenditure [d,t] / Area Share [d]	3.62	7.81	2009
Share of Paved Road Construction [d,t] / Pop. Share [d,1962]	1.35	6.99	451
Share of Paved Road Construction [d,t] / Area Share [d]	2.97	8.15	451
Panel B: Main Regressors			
Presidential District Dummy [d,t]	0.16	0.37	2009
Multi-Party Dummy [t]	0.53	0.50	49
Kikuyu District Dummy [d,1962]	0.17	0.38	41
Kalenjin District Dummy [d,1962]	0.15	0.36	41
Presidential Share [d,t]	0.12	0.29	2009
White Highlands [d]	0.22	0.42	41
President District of Birth [d,t]	0.02	0.15	2009
Second Cabinet Group [d,t]	0.10	0.29	2009
Panel C: Control Variables			
Population [d,1962], Thousands	211	164	41
Area [d], Thousand Sq Km	13.9	17.4	41
Urbanization Rate [d,1962], %	7.4	20.0	41
Total Earnings in the Formal Sector [d,1966], Millions 2000$	10.5	21.0	41
Total Employment in the Formal Sector [d,1963], Thousands	42.6	77.2	41
Total Value of Cash Crop Production [d,1963], Millions 2000$	8.3	20.1	41
Mombasa-Kampala Dummy [d]	0.27	0.44	41
Border Dummy [d]	0.27	0.44	41
Euclidean Distance (km) to Nairobi [d]	268.3	146.1	41

Notes: Panel A: For our main dependent variable, road expenditure regressions are run on a sample of 41 districts annually from 1963 to 2011. When using data on paved road construction, regressions are run using maps on 41 districts from 1963 to 2011. Maps are not available annually, hence the change in the number of observations. See Data Appendix for data sources and construction of variables.

Appendix A Table 2: Ethnic Profile of Kenya's Cabinet

Cabinet Share (%) of Main Ethnic Groups

Cabinet Year	Kikuyu	Luo	Luhya	Kalenjin	Kamba	Kisii	Coastal	Meru	Somali	Turkana-Samburu	Embu	Masai	Cabinet Size
1963	35.3	23.5	5.9	0.0	5.9	5.9	5.9	5.9	0.0	0.0	0.0	2.9	17
1964	31.6	21.1	5.3	5.3	10.5	5.3	5.3	5.3	0.0	0.0	0.0	5.3	19
1966	27.3	13.6	9.1	4.6	9.1	9.1	9.1	4.5	0.0	0.0	4.5	4.6	22
1969	31.8	9.1	9.1	9.1	9.1	13.6	9.1	4.5	0.0	0.0	4.5	0.0	22
1974	31.8	9.1	9.1	9.1	9.1	9.1	9.1	4.5	0.0	0.0	4.5	4.6	22
1979	29.6	7.4	11.1	14.8	7.4	11.1	7.4	3.7	0.0	0.0	3.7	3.7	27
1983	20.8	12.5	12.5	16.7	8.3	4.2	8.3	4.2	4.2	0.0	4.2	4.2	24
1988	25.0	14.7	11.8	11.8	11.8	5.9	5.9	2.9	2.9	0.0	2.9	4.4	34
1993	6.0	4.0	16.0	20.0	16.0	8.0	8.0	8.0	4.0	0.0	4.0	6.0	25
1998	5.4	0.0	17.9	25.0	14.3	7.1	10.7	3.6	7.1	0.0	3.6	5.4	28
2003	21.2	15.4	19.2	7.7	7.7	0.0	11.5	7.7	0.0	0.0	3.8	5.8	26
2005	22.8	3.0	24.2	6.1	9.1	6.1	12.1	3.0	3.0	3.0	3.0	4.5	33
2008	17.4	11.6	18.6	13.9	7.0	4.7	9.3	2.3	7.0	2.3	2.3	3.5	43

Notes: For each year when an election is held, we list out the ethnic profile for the cabinet. The cabinet includes the president, vice-president and ministers with portfolio. In the single-party era (1970-1992), elections are held for constituency representation, but candidates run under the same party label (KANU). In the multi-party era (1963-1969, 1992-to-date) elections are held for constituency representation and for the executive seat. See Data Appendix for data sources and construction of variables.

Appendix A Table 3: Ethnic Distribution of Kenya's Population

					Population Share (%) of Main Ethnic Groups								
Census Year	Kikuyu	Luo	Luhya	Kalenjin	Kamba	Kisii	Coastal	Meru	Somali	Turkana-Samburu	Embu	Masai	Pop. (Millions)
1962	18.8	13.4	12.7	10.8	10.5	7.0	6.7	5.7	4.3	4.0	1.9	1.8	8.6
1969	20.1	13.9	13.3	10.9	10.9	7.0	6.5	5.5	3.0	3.6	1.5	1.4	11.0
1979	20.9	13.2	13.8	10.8	11.3	6.7	6.4	5.5	3.4	2.9	1.6	1.6	15.3
1989	20.8	12.4	14.4	11.5	11.4	6.7	6.9	5.5	2.9	2.7	1.7	1.8	21.4
2003(DHS)	22.9	12.0	14.9	10.6	11.5	6.3	5.9	5.6	3.5	1.4	1.6	2.3	32.0
2009	17.2	10.8	13.8	12.9	10.1	6.4	6.1	4.8	7.0	4.2	1.3	2.2	38.6

Notes: The table shows for each census the national share of the main group (except 2003). The 1999 population census does not disclose the ethnic profile of the country. We instead use the 2003 *Kenya Demographic and Health Survey* to get a sense of the national ethnic profile. See Data Appendix for data sources and construction of variables.

B Mathematical Proof

Algebra: is η^{BA} decreasing in θ?

$$\eta^{BA} = \frac{\eta^{AA}}{\theta}$$

$$R'(\eta^{AA}) - \pi - \frac{1-\pi}{\theta} = 0$$

$$\frac{\partial \eta^{AA}}{\partial \theta} = -\frac{\frac{1-\pi}{2\theta^{\frac{1}{2}}}}{R''(\eta^{AA})} > 0$$

$$\frac{d\eta^{BA}}{d\theta} = \frac{\partial \eta^{AA}}{\partial \theta}\frac{1}{\theta} - \frac{\eta^{AA}}{2\theta^{\frac{1}{2}}} = -\frac{\frac{1-\pi}{2\theta^{\frac{1}{2}}}}{R''(\eta^{AA})}\frac{1}{\theta} - \frac{\eta^{AA}}{2\theta^{\frac{1}{2}}}$$

$$\frac{1}{2\theta^{\frac{1}{2}}}\left[\frac{1-\pi}{-\theta R''(\eta^{AA})} - \eta^{AA}\right]$$

$$\frac{1}{2\theta^{\frac{1}{2}}}\left[\frac{R'(\eta^{AA}) - \pi}{-R''(\eta^{AA})} - \eta^{AA}\right]$$

$$\frac{1}{2\theta^{\frac{1}{2}}}\left[\frac{R'(\eta^{AA}) - \pi + \eta^{AA}R''(\eta^{AA})}{-R''(\eta^{AA})}\right]$$

So for monotonically decreasing we need

$$R'(\eta^{AA}) - \pi + \eta^{AA}R''(\eta^{AA}) < 0$$

which will not be true for R almost linear.

C   Additional Results

This appendix provides additional results that are discussed in the text.

C.1   Robustness checks

C.1.1   Improved Road Construction

In column (6) of Table 3, we find that presidential districts obtain 4.71 times more paved roads than their population share. We also find that during democratic years this effect is significantly dampened. Note that paved roads are either improved or earthen roads that have been upgraded, or are newly constructed roads which are paved. When using as a dependent variable the ratio of the share of improved road construction in district d at time t to the population share of district d in 1962, we find no statistical difference between presidential and non-presidential districts, whether the political period is democracy or autocracy. The coefficient of the presidential district dummy is equal to 0.25 and is non-significant, while the coefficient on its interaction with the multi-party dummy is -0.25 and non-significant. This suggests that the president only favors his own ethnic group by granting them more paved roads. Other ethnic groups are not compensated by receiving more improved roads.[1]

C.1.2   Non-Linearity in Time Trends for Control Variables

The effect of control variables could be non-linear over time. For instance, it could be rational to build roads around the capital Nairobi first, and later extend road building to the rest of the country. The negative effect of distance to Nairobi would decrease over time and we would fail to capture this by interacting it with a linear trend. This could explain why Kikuyu areas (which are close to Nairobi) obtain roads first, and why Kalenjin areas (which are further away from Nairobi) later obtain roads. Likewise, the government could build roads in already developed areas first and then expand the network to remote/poor areas. This could explain why Kikuyu areas (which export more cash crops and have more formal employment at independence) receive more roads first, and why Kalenjin areas later obtain roads. We run our baseline regression (see Appendix C Table 1, column (1)), and interact the control variables with a time trend and time trend square. The interaction of the presidential district and multi-party dummies are insignificant at the standard levels (see column (2)), but the point estimates are similar.

C.1.3   Regression To The Mean

Regression to the mean could account for our findings. Kikuyu (until 1979) and Kalenjin (until 1992) districts have received large shares of road investments. The fact that investments shifted to Kalenjin districts after 1979 and to other districts after 1992 could

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[1]Results not shown but available upon request.

be explained by low economic and social returns of new road investments in those particular districts. However, this is not warranted given network effects, as the economic returns of new road investments might not be decreasing in past investments. Second, even if a district is spatially congested, the president can upgrade the network (bitumenization, increasing the number of lanes, etc.). Lastly, we can control for the number of years a district has been a presidential district. Coefficients are unaltered, although less precisely estimated (see Appendix C Table 1, column (3)).

C.1.4 Spatial Dependence

If observations are spatially correlated, estimated standard errors are incorrect. For instance, if neighboring observations are positively correlated, estimated standard errors would be too low, causing incorrect inference. The cluster covariance matrix (CCE) approach is to cluster observations so that group-level averages are independent.[2] As demonstrated in Bester, Conley, and Hansen (2011), clustering observations using few groups can ensure spatial independence. We subject our main results to various different levels of clustering. First, we cluster observations at the ethnic group level (13 groups) and province level (8 groups). Second, we use district geographical coordinates and average longitude and latitude for Kenya to separate districts into four quadrants: North-West, North-East, South-West and South-East. We cluster observations at the quadrant level (4 groups). Third, we cluster the data using North vs. South (2 groups) or West vs. East (2 groups). We only report results for standard errors clustered at the ethnic group level (see Appendix C Table 1, column (4)) and at the province level (column (5)), our results are robust to these forms of clustering. The plug-in HAC covariance matrix approach is to plug-in a covariance matrix estimator that is consistent under heteroskedasticity and autocorrelation of unknown form. This approach models spatial dependence instead of time dependence, and has been popularized by Conley (1999). It can be tested in STATA by specifying that each observation is related to any observation less than X km away.[3] We use the geographical coordinates of each district to test various thresholds: 100 km, 200 km or more than 200 km. We only report results with the 200 km threshold (see column (6)) but other results are available upon request. Results remain unchanged after accounting for spatial dependence.

C.1.5 Tax Discrimination

It could be that our results are not related to ethnic favoritism at all, and instead the presidential ethnic group receives more transfers because it also pays more taxes. We test this hypothesis by investigating whether the president taxes differently the crop in which her own group specializes. Using production data at the district level in 1965 for coffee and tea, the two main exports of Kenya, we observe that coffee is primarily a

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[2]We thank Timothy Conley for pointing this very simple method to us.

[3]We thank Jordan Rappaport for sharing his STATA code "gls_sptl.005.do".

Kikuyu crop while tea is primarily a Kalenjin crop.[4] We test if the president, whether Kikuyu or Kalenjin, taxes more (or less) her own ethnic group than the other ethnic group, in democracy versus autocracy. For both coffee and tea, we know the yearly taxation rate from 1963 to 2004.[5] The rate is negative when the producer price decided by the government is lower than the international export price, which is interpreted as taxation. Conversely, the rate is positive when the producer price is higher than the export price, which is interpreted as a subsidy. The average taxation rate for the period 1963-2004 was -0.107, this implies that 10.7% of the output value of coffee and tea was captured by the government. We regress the yearly taxation rate on a dummy if it is the crop of the president (coffee when Kikuyu, tea when Kalenjin) and its interaction with the multi-party dummy, including time and crop fixed effects and a crop time trend. We run regressions on a sample of 2 crops across the period 1963-2004.[6] The coefficient of the presidential district dummy is -0.012 and insignificant, while the coefficient on its interaction with the multi-party dummy is 0.019 and is insignificant. Thus, we cannot reject the hypothesis that presidents are not taxing more (or less) their "own" crop, whether in autocracy or democracy. Autocrats only discriminate groups using transfers, not taxes, which confirms that road investments can be seen as net benefits.

C.2 Additional Results using Road Expenditure Data

C.2.1 Vice-President/Prime Minister Effects

The fact that swing tribes do not obtain more road expenditure during democracy does not preclude any coalition effect. The issue is to identify coalition partners and any definition is necessarily arbitrary. In Table 4, we use the second group in the cabinet as a potential marker of receiving more attention from the presidential group. An alternative definition of the second group is to use the ethnicity of the vice-president. There have been 11 vice-presidents during the period 1964-2011 and all of them have been from a different ethnic group than their president. Further, there has been one prime minister since 2008. We create a vice-presidential (prime minister) district dummy [d,t] variable whose value is one if more than 50% of the district's ethnicity matches the ethnicity of the vice-president (prime minister) in year t.[7] The effects for presidential districts are larger in magnitude since we are now comparing them with non-presidential districts that do not have the vice-presidency. In single-party autocracy, the group of the vice-president/prime minister obtains 2.46 more investments than its population share while this effect is canceled in democracy (see Appendix C Table 2, column (2)). This gives further evidence for coalition effects in autocracy.

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[4]69.6% of coffee is produced in Kikuyu districts, and 87.8% of tea is produced in Kalenjin districts.

[5]Our data source does not extend beyond the year 2004.

[6]We have 84 observations. Regression results are not shown but available upon request.

[7]We consider the vice-president for the years 1964-2011, and the Prime Minister for the years 2008-2011.

C.2.2 Additional Second Group Effects

We take several approaches to explore the cabinet data: (i) as we know the ranking of ministerial positions in terms of the investment budget, we recalculate cabinet shares for each ethnic group using the president and the top ten fiscal positions, and (ii) as we know the listing of the ministerial appointments (president, vice-president/prime minister, minister of finance, minister of defence, etc.), we recalculate cabinet shares for each ethnic group using the president and the top ten hierarchical positions. For each approach of how to interpret cabinet appointment, we identify the second largest group in the cabinet and look at its effect on road investments in single-party autocracy versus multi-party democracy. Compared to the findings we obtained when using all the cabinet positions (see Table 4 column (5)), point estimates are smaller but the findings are the same (see Appendix C Table 2, columns (3) and (4)). The second group in the cabinet receives more road investments in autocracy, but this does not hold during democracy.

C.2.3 Cabinet Share Effects

Does the presence of an ethnic group in the cabinet affect the share of road investments that this ethnic group receives? We run the same baseline specification with the main variable of interest now being the cabinet share in year t of the majoritarian ethnic group in the district.[8] The larger the cabinet share of an ethnic group, the more road investments we expect for districts with these ethnic groups. We find a positive effect of cabinet share in autocracy which is reduced in democracy.[9] Yet, these results disappears when we include the president and second group effects (see Appendix C Table 1, column (5)). We can infer from this exercise that cabinet share does not matter *per se*, but the cabinet ranking (president, second group) does.

C.2.4 Road and Public Works Minister's Effects

We examine whether the road minister can influence road investments into her district. First, we create a road minister district of birth dummy variable whose value is one if a district d is the birthplace of the road minister in year t.[10]. We do not find any significant effect (see Appendix C Table 1, column (6)). We then create a dummy variable whose value is one if more than 50% of the district population is from the ethnic group of the road minister, but no effect is found.[11]. One could argue that the public works minister

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[8]For each district, the majoritarian ethnic group is the group that represents more than 50% of the population. For the three districts with no majoritarian group (Nairobi, Mombasa and Trans-Nzoia), the majoritarian ethnic group does not exist and their cabinet share is equal to 0.

[9]Those result are not shown but available upon request.

[10]There have been 18 road ministers in the period 1963-2011

[11]The road minister has been the public works minister except in the period 1979-1988 when it was the minister for *Transport and Communications*, and in the period 2008-2011 when it was the minister for *Roads*

has the real power when it comes to road building. There have been 21 public work ministers in 1963-2011. Likewise, we create a district dummy whose value is one if it is the district of birth of the public works minister and a district dummy whose value is one if more than 50% of the district population matches the ethnic group of this minister. We do not find any effect.

C.3 Additional Results using Cabinet Data

We study how democracy affects the distribution of cabinet positions between the presidential group, the second group and other groups. The hypothesis we test is whether the president favors her ethnic group in terms of allocating cabinet positions. We run panel data regressions for ethnic group e and years t of the following form:

$$Cpop_{e,t} = \gamma_g + \alpha_t + \beta Presgroup_{e,t} + \delta[Presgroup_{e,t} \times Multiparty_t] + u_{e,t} \qquad (1)$$

where $Cpop_{e,t}$ is our index of cabinet favoritism which we define as the ratio between the share of cabinet positions allocated to ethnic group e in year t and the population share of that ethnic group in 1962. $Presgroup_{e,t}$ is a dummy variable whose value is one if the ethnic group e matches with the president's ethnic group in year t. $Multiparty_t$ is a dummy variable whose value is one if the year t is a year with multi-party. Thus, β captures the effect of being a presidential ethnic group on cabinet positions in single-party autocracy, while $\beta + \delta$ captures this effect in multi-party democracy. γ_g and α_t are ethnic group and year fixed effects. Lastly, $u_{g,t}$ are individual disturbances clustered at the ethnic group level.[12]

As explained in section C.2.2, we also have data on the ranking of cabinet positions in terms of investment budget and official listing. We alternatively use cabinet share data considering the president and the top ten fiscal positions, and the president and the top ten hierarchical positions. Results reported in Appendix C Table 3 all include an ethnic group time trend. In single-party autocracy, the presidential group gets 1.64 times more cabinet positions than its population share (column (1)). Given an average population share of 15.1, this means the presidential group obtains on average 24.8% of cabinet positions. This effect increases if we consider the top hierarchical and fiscal positions, which is logical if the president gives the best positions to her own ethnic group. For instance, the presidential group obtains 2.28 times more top fiscal positions than its population share (column (2)). Surprisingly, democracy does not modify this distribution as the interaction of the presidential and multi-party dummies is zero and insignificant. We further investigate whether the second cabinet group obtains more positions (or less) in multi-party democracy. We use all positions to define the second group. By definition, the second cabinet group has more positions than the third cabinet group, the fourth cabinet group, etc. Interestingly, the interaction of the second cabinet group and multi-party dummy is insignificant. Thus, we cannot reject the hypothesis that democracy

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[12]Regressions are run on 13 ethnic groups (12 African ethnic groups and non-Africans) over the period 1963-2011 which results in 13 cabinet years and hence 169 observations.

cancels the effect for the second cabinet group. The previous analysis indicates that the cabinet structure is not significantly modified between autocracy and democracy. Distributive politics in autocracy does not come from more political representation for powerful groups but from less checks and balances against their power. This is consistent with not finding any independent effect of the cabinet share once we control for being the group of the president and the second group (see section C.2.3).

References

BESTER, A., T. CONLEY, AND C. HANSEN (2011): "Inference with Dependent Data Using Cluster Covariance Estimators," *Journal of Econometrics, Forthcoming.*

CONLEY, T. G. (1999): "GMM estimation with cross sectional dependence," *Journal of Econometrics*, 92(1), 1–45.

Appendix C Table 1: Additional Robustness Checks (1)

Dependent Variable: Share of road development expenditure [d,t] / Population share [d,1962]	(1)	(2)	(3)	(4)	(5)	(6)
Presidential District Dummy [d,t]	1.74***	1.78***	1.87*	1.74***	1.74***	1.74***
	(0.49)	(0.47)	(0.95)	(0.35)	(0.19)	(0.48)
Presidential District Dummy [d,t] x Multi-Party Dummy [t]	-1.32**	-1.15	-1.25**	-1.32***	-1.32***	-1.32**
	(0.63)	(0.75)	(0.50)	(0.35)	(0.28)	(0.62)
Observations	2009	2009	2009	2009	2009	2009
Adj. R-squared	0.12	0.12	0.12	0.12	0.12	0.12
District and year fixed effects	Y	Y	Y	Y	Y	Y
Baseline controls*year	Y	Y	Y	Y	Y	Y
Baseline controls*year²	N	Y	N	N	N	N
Number of years presidential district	N	N	Y	N	N	N
Clustering / Conley standard errors	District	District	District	Ethnic Group	Province	200 km
District time trends	N	N	N	N	N	N
No. of districts	41	41	41	41	41	41
F-test [p-value]	0.90	1.16	0.48	1.44	4.16*	0.95
President + President * Multi-Party = 0	[0.35]	[0.29]	[0.49]	[0.25]	[0.08]	[0.34]

Notes: OLS regressions using data on 41 districts annually from 1963 to 2011. Standard errors corrected for clustering at the district level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 1%. *Presidential District Dummy [d,t]* is a dummy variable whose value is one if more than 50% of the population of district d is from the ethnic group of the president at time t. *Multi-Party Dummy [t]* is a dummy variable whose value is one if there is multi-partyism in year t. Column (1) is the baseline specification as before. In column (2) we interact the baseline controls with the square of a time trend. In column (3) we also include the number of years a district has been a presidential district. In column (4) standard errors are corrected for clustering at the ethnic group level (13). In column (5) standard errors are corrected for clustering at the province level (8). In column (6) standard errors are corrected for spatial clustering using a 200 km threshold. The F-test is used to test the null hypothesis of joint equality between a presidential district and a non-presidential district during multi-party. Columns (1)-(6) include controls interacted with a time trend. These controls are: [i] demographic (district population in 1962, district area in sq km, and urbanization rate in 1962). [ii] economic activity (district total earnings in 1966, employment in the formal sector in 1963 and value of cash crop exports in 1965). [iii] economic geography (a dummy variable whose value is one if any part of the district is on the Mombasa-Nairobi-Kampala corridor, a dummy variable whose value is one if the district borders Uganda or Tanzania, and the Euclidean distance in km to Nairobi). See Data Appendix for data sources and construction of variables. See Data Appendix for data sources and construction of variables.

Appendix C Table 2: Additional Robustness Checks (2)

Dependent Variable: Share of road dvt expenditure [d,t] / Population share [d,1962]						
	(1)	(2)	(3)	(4)	(5)	(6)
Presidential District Dummy [d,t]	1.74***	2.62***	1.89***	2.13***	2.30**	1.73***
	(0.49)	(0.71)	(0.50)	(0.56)	(0.85)	(0.49)
Presidential District Dummy [d,t] x Multi-Party Dummy [t]	-1.32**	-1.63**	-1.43**	-1.43**	-2.27*	-1.33**
	(0.63)	(0.69)	(0.64)	(0.64)	(1.17)	(0.62)
Vice-Presidential District Dummy [d,t]		1.46**				
		(0.56)				
Vice-Presidential District Dummy [d,t] x Multi-Party Dummy [t]		-1.42**				
		(0.61)				
Second Cabinet Group [d,t], *Fiscal*			1.01*			
			(0.52)			
Second Cabinet Group [d,t], *Fiscal* x Multi-Party Dummy [t]			-1.20**			
			(0.59)			
Second Cabinet Group [d,t], *Hierarchy*				1.09**		
				(0.42)		
Second Cabinet Group [d,t], *Hierarchy* x Multi-Party Dummy [t]				-0.98*		
				(0.55)		
Second Cabinet Group [d,t], *All Positions*					1.66**	
					(0.73)	
Second Cabinet Group [d,t], *All Positions* x Multi-Party Dummy [t]					-2.50**	
					(1.19)	
Cabinet Share of Maj. Ethnic Group [d,t]					0.02	
					(0.04)	
Cabinet Share of Maj. Ethnic Group [d,t] x Multi-Party Dummy [t]					0.04	
					(0.05)	
Road Minister District of Birth [d,t]						0.62
						(0.47)
Road Minister District of Birth [d,t] x Multi-Party Dummy [t]						-0.32
						(0.82)
Observations	2009	2009	2009	2009	2009	2009
Adj. R-squared	0.12	0.12	0.13	0.12	0.12	0.13
District and year fixed effects	Y	Y	Y	Y	Y	Y
Baseline controls*year	Y	Y	Y	Y	Y	Y
District time trends	N	N	N	N	N	N
No. of districts	41	41	41	41	41	41
F-test [*p-value*]	0.90	2.64	1.12	2.50	0.00	0.81
President + President * Multi-Party = 0	[0.35]	[0.11]	[0.30]	[0.12]	[0.97]	[0.37]

Notes: OLS regressions using data on 41 districts annually from 1963 to 2011. Standard errors corrected for clustering at the district level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 1%. *Presidential District Dummy [d,t]* is a dummy equal to one if more than 50% of the population of district d is from the ethnic group of the president at time t. *Multi-Party Dummy [t]* is a dummy equal to one if there is multi-partyism in year t. *Vice-Presidential District Dummy [d,t]* is a dummy variable whose value is one if more than 50% of the population of district d is from the ethnic group of the vice-president at time t. *Second Cabinet Group [d,t]* is a dummy variable whose value is one if more than 50% of the population of district d is from the second largest group in the cabinet at time t. *Fiscal, Hierarchy* and *All Positions* denote that we use the president and the top ten fiscal positions, top ten hierarchical positions, or all the positions. *Cabinet Share of Maj. Ethnic Group [d,t]* is the cabinet share at time t of the majoritatian group in district d. *Road Minister District of Birth [d,t]* is a dummy variable whose value is one if district d is the district of birth of the road minister at time t. The F-test is used to test the null hypothesis of joint equality between a presidential district and a non-presidential district during multi-party. Control variables are defined as before. See Data Appendix for data sources and construction of variables.

Appendix C Table 3: Explaining Cabinet Ethnic Share

Dependent Variable: Cabinet ethnic share [e,t] / Population share [e,1962]						
Cabinet sample:	All (1)	Fiscal (2)	Hierarchy (3)	All (4)	Fiscal (5)	Hierarchy (6)
Presidential Group Dummy [e,t]	0.64*** [0.13]	1.18** [0.54]	0.82** [0.27]	0.90*** [0.26]	1.36** [0.51]	1.05* [0.52]
Presidential Group Dummy [e,t] x Multi-Party Dummy [t]	0.02 [0.28]	-0.10 [0.51]	-0.24 [0.47]	0.11 [0.33]	-0.03 [0.54]	-0.22 [0.51]
Second Cabinet Group [e,t]				1.00*** [0.17]	0.71 [0.47]	0.75 [0.86]
Second Cabinet Group [e,t] x Multi-Party Dummy [t]				-0.59 [0.44]	-0.35 [1.07]	-0.96 [1.38]
Observations	169	169	169	169	169	169
Adj. R-squared	0.56	0.20	0.23	0.58	0.19	0.22
Ethnic group and year fixed effects	Y	Y	Y	Y	Y	Y
Group time trends	Y	Y	Y	Y	Y	Y
No. of ethnic groups	13	13	13	13	13	13
F-test [p-value] President + President * Multi-Party = 0	5.9** [0.03]	11.6*** [0.00]	9.1** [0.01]	204.6*** [0.00]	84.0*** [0.00]	4.0* [0.07]

Notes: OLS regressions using data on all elections from 1963 to 2011, for 13 groups (twelve African ethnic groups and another category [Asians, Arabs, Non-Kenyans]). Standard errors corrected for clustering at the ethnic group level are reported in parentheses; *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable *Cabinet Ethnic Share [e,t] / Population Share [e,1962]* is defined as the ratio between the cabinet share of ethnic group e at time t to the national population share of ethnic group e in 1962. *Presidential Group Dummy [e,t]* is a dummy variable whose value is one if ethnic group e is the group of the president. *Multi-party Dummy [t]* is a dummy variable whose value is one if there is multi-partyism in year t. *Second Cabinet Group [e,t]* is dummy variable whose value is one if ethnic group e is the second largest group in the cabinet. In columns (1) and (4), the dependent variable considers all cabinet positions. In columns (2) and (5), the dependent variable considers the cabinet share using the president and the top ten fiscal positions. In columns (3) and (6), the dependent variable considers the cabinet share using the president and the top ten hierarchical positions (according to the list provided by the Office of the President). The F-test is used to test the null hypothesis of joint equality between a presidential district and a non-presidential district during multi-party. See Data Appendix for data sources and construction of variables.