Ethnic Favoritism in Education in Kenya

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ABSTRACT

We test the claim that African leaders favor members of their own ethnic groups by studying ethnic favoritism in the education sector in Kenya. We use data on the educational attainment of more than fifty thousand Kenyans dating back to the colonial era, as well as information about the ethnic identities of Kenyan presidents, cabinet members, and high-level education bureaucrats since the 1960s. Consistent with previous work, we find that having a coethnic as president during one's school-age years is associated with an increase in the schooling that children acquire. In contrast to recent studies, we find that multiparty political competition has no impact on the degree of ethnic favoritism in the education sector. We also go beyond prior work in three ways. First, we show that coethnics of the minister of education also acquire more schooling than children from other ethnic groups — evidence that ministerial appointments come with

real power to impact distributive politics. Second, we investigate the effects of coethnicity using different definitions of the president's ethnic community and provide evidence that the beneficiaries of ethnic favoritism can shift with the introduction of democratic electoral competition. Third, we examine several mechanisms through which having a coethnic president might matter and find much greater support for mechanisms emphasizing the supply of inputs to coethnics than those emphasizing the demand by coethnics for greater educational opportunities.

Keywords: Political economy; comparative politics; executive politics; the bureaucracy.

The belief that people in positions of political power will use their offices to favor their ethnic kin is widespread in Africa. The assumption of ethnic favoritism is reflected in the results of public opinion polls conducted across the continent (KIPPRA Research Team, 2012) and undergirds the leading theories that have been advanced to explain voting behavior (Bates, 1983; Carlson, 2015; Ferree, 2006; Ichino and Nathan, 2013; Posner, 2005), economic policymaking (Easterly and Levine, 1997), and the structure of clientelist networks (Wantchekon, 2003), among other outcomes. However, while anecdotal examples of ethnic favoritism abound, the volume of systematic empirical work documenting its existence is incommensurate with the importance of the phenomenon in our understanding of African affairs. This paper joins a small but growing number of studies that employ large-scale quantitative data to document the extent and study the patterns of ethnic favoritism in an African setting.

We focus on ethnic favoritism in educational outcomes both because this is an important topic in its own right (Alwy and Schech, 2004;

Kramon and Posner, 2014) and because it provides a window onto the broader phenomenon of ethnic favoritism by political leaders. By probing its sources and uncovering its patterns we can glean valuable lessons about how distributive politics operates in an African setting.[1] We study the subject in Kenya because of the salience of ethnicity in the country's political affairs (Wrong, 2009) and because of the availability of comprehensive data on educational attainment and other relevant outcomes, which makes it possible to undertake analyses that are broader and deeper than those presented in prior (and especially cross-national) work.

Ethnic favoritism, of course, is not the only factor that drives cross-group differences in schooling outcomes. A central challenge, therefore, is to separate out the effects of ethnic favoritism from the effects of other factors that also affect educational attainment. Our empirical strategy, elaborated below, controls for these other individual- and group-level factors in order to isolate the impact on schooling outcomes of having a coethnic in a position of political power.

We use data from five separate Demographic and Health Surveys (DHS) conducted in Kenya between 1989 and 2009 to construct a time-series cross-sectional dataset that includes information on the educational attainment of more than fifty thousand individuals dating back to before the country's independence in 1963. These data permit us to analyze the impact on educational attainment of having a coethnic in a position of political power during one's primary and secondary school years. In keeping with the findings of other research on ethnic favoritism by Kenyan presidents (Barkan and Chege, 1989; Burgess *et al.*, 2015; Jablonski, 2014; Morjaria, 2011; Nellis, 1974), we find evidence that the president's ethnic kin are in fact favored with respect to their educational achievements.[2] Specifically, we find that having a coethnic as president during one's school-aged years is associated with an increase of 0.36 years of primary schooling and 0.12 years of secondary schooling (increases of roughly 6 and 12 percent, respectively). These results are

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[1]We must be cautious, however, in making general claims about distributive politics from the patterns of ethnic favoritism we observe in the education sector, as patterns of favoritism may differ in other areas (Kramon and Posner, 2013).

[2]These main findings are also in keeping with the results of cross-national studies of ethnic or regional favoritism by political leaders, such as Franck and Rainer (2012), Hodler and Raschky (2014), and De Luca *et al.* (2015).

robust to multiple measures of educational attainment, out-of-sample tests using census data with more than 3 million observations, and a test in which we analyze educational outcomes among the subset of Kenyan children who were enrolled in primary or secondary school during the three years immediately preceding and following the transitions from President Jomo Kenyatta to President Daniel Arap Moi in 1978 and from President Moi to President Mwai Kibaki in 2002. These results are bolstered by the fact that we find no effect in a placebo test in which we move that six-year window to the periods before or after these presidential transitions.

Along with Burgess *et al.* (2015), we also investigate how ethnic favoritism varies across democratic and non-democratic moments of Kenya's political history. In contrast to that study, but in keeping with the cross-national result reported in Franck and Rainer (2012) and De Luca *et al.* (2015), we find no evidence that patterns of favoritism by the president to his ethnic group were altered by the shift from single-party to multiparty politics.

We go beyond previous research in three important respects. First, we investigate the impact on schooling outcomes of having a coethnic serving as the minister or permanent secretary of education, and of having coethnics in other important cabinet positions. These analyses are motivated by evidence from prior research which shows that African elites often strategically allocate cabinet positions to members of other ethnic groups in exchange for regime support (Arriola, 2009). While this is well established, there is no empirical research on the distributive consequences of these cabinet allocations. Accounting for the potential ethnic favoritism of these actors, in addition to the president, is thus crucial to understanding how ethnicity shapes the allocation of public goods in African countries. We find strong evidence that these actors matter: for every one of an individual's primary school years that corresponds with the tenure in office of a coethnic minister of education, that individual completes an average of 0.06 more years of primary schooling. This amounts to slightly more than an additional third of a year of schooling if a coethnic served as minister of education during all of a child's primary school years — an effect roughly comparable to having a coethnic president. We also find that having a coethnic minister of education during the whole of a child's secondary school years is associated with an additional 0.09 years of secondary schooling —

about a ten percent increase. These findings complement those reported in Francois *et al.* (2015), who show that African presidents appoint ministers from other ethnic groups but do not provide evidence of whether or not this matters for patterns of resource distribution. We demonstrate that it does.

Second, in investigating the impact of sharing an ethnic tie with the president, we explore the implications of modifying the way we define the president's ethnic group. In most analyses of ethnic favoritism, coethnicity with the patron is defined in terms of common membership in an ethnic census category. However, the communal bonds that matter in practice could equally well stem from more localized connections (such as belonging to the same ethnic sub-group or clan) or from more encompassing associations (such as membership in a broad, ethnically defined political coalition that includes multiple census category groups). We therefore supplement our main estimates of ethnic favoritism with additional analyses in which we vary the definition of the president's ethnic group, both more narrowly and more broadly. Our results, which suggest both that culturally-defined sub-groups within the president's ethnic community sometimes benefit disproportionately and also that broader ethnic coalitions are sometimes the relevant unit of political favoritism — and that whether or not they do varies with the size of the president's own ethnic group and the nature of the political regime — challenge existing, and overly simplistic, understandings of how ethnicity matters for distributive politics.

In further contrast to prior work, we present evidence to adjudicate among several mechanisms that might account for the patterns of ethnic favoritism we identify. Drawing on five decades of district-level data on school construction, we test whether the channel through which presidents favor their coethnics lies in preferential access to schooling inputs. Using data on infant mortality and female adult heights (a proxy for child nutrition), we test whether the causal link lies in favoritism in other domains that may have an indirect impact on educational attainment. We also draw on a variety of other analyses to investigate whether the mechanism lies in expectations about changes to the economic returns to schooling when a coethnic enters or exits power. Our findings provide evidence only for the first mechanism, which we interpret as suggesting that the higher educational attainment of the president's coethnics is due to their greater access to educational inputs.

1   Data

DHS are periodic, nationally representative surveys that collect information on population, health, and nutrition at the household level in more than 85 developing countries. We pool the individual-level data from the DHS from the Kenyan survey years of 1989, 1993, 1998, 2003, and 2008–2009. The DHS interviews every woman in the households it samples, along with male household members in a randomly selected sub-sample of households. We combine the male and female data sets, generating a master data set with more than 50,000 observations that includes age cohorts, based on the year in which an individual began primary or secondary school, that stretch from the mid-1950s to the early-2000s.[3]

Our main dependent variables, which come straightforwardly from the DHS data, are the number of years of primary and secondary schooling that an individual has received.[4] To get a sense of the variation we seek to explain, Panels A and B of Table 1 present the average number of years of primary and secondary schooling completed, broken down by each of Kenya's major ethnic groups and by decade. As the last columns make clear, average rates of schooling in Kenya vary markedly across ethnic groups. For example, Kikuyu children, the most advantaged group according to the data, have had about 16 percent more primary schooling and 72 percent more secondary schooling than Kalenjin children (6.59 years vs. 5.67 years and 1.31 years vs. 0.76 years, respectively) and nearly 40 percent more primary schooling and 68 percent more secondary schooling than children from other ethnic communities (that is, ethnic groups other than the five largest ones — 6.59 years vs. 4.78 years and 1.31 years vs. 0.78 years). Table 1 also makes clear that the sizes of the gaps among Kenya's ethnic groups have varied over time. Kikuyu children have the highest rates of school attainment in all periods, but the distance between them and the other

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[3]We correct for the imbalance in female and male sample sizes by weighting in analyses that report raw education outcomes and by including a control variable for respondent's gender in all regressions. We also explicitly test for cross-gender differences in Table 12, below.

[4]Until 1985, Kenyan students attended primary school for seven years. Thereafter, the system was changed to an 8-4-4 system, adding an eighth year to primary schooling. Thus the variable ranges from 0 to 7 prior to 1985 and from 0 to 8 afterwards. The secondary school-years variable ranges from 0 to 4.

major groups has shifted over the years. Whereas Kikuyu children in the 1960s completed an average of 47 percent more years of primary education than Kalenjin children and 39 percent more years of primary education than Luo children, these gaps narrowed to just 8 percent and 5 percent, respectively, in the 1980s. Gaps in secondary schooling narrowed as well. Part of this is no doubt due to the natural process of catch-up, as groups with little exposure to formal education during the colonial era were incorporated into the national education system after independence. But the pattern also raises questions about whether something about the nature of politics that varied across the decades may have also contributed to the changes over time in the comparative fortunes of children from different ethnic communities.

Some initial evidence for this conjecture is provided in Panels C and D of Table 1, where we break down the average schooling attainment of each major ethnic group by political regime. While average primary schooling in Kenya increased between the Kenyatta and Moi presidencies, it increased particularly strongly among Moi's Kalenjin coethnics (and also among the Luo) and decreased relative to the national average among the Kikuyu, Kenyatta's coethnics (see Panel C). Then, when the presidency was transferred back into the hands of a Kikuyu, President Mwai Kibaki, in 2003, the strongest increase relative to the national average was among the Kikuyu — an increase all the more noteworthy given the fact that Kikuyus, by that time, were already approaching the ceiling of 8 years of primary schooling, so improvements were much harder to attain. Similar patterns are evident at the secondary school level as well. The largest increase in secondary schooling attainment between the Kenyatta and Moi years was among the Kalenjin (see Panel D), who experienced a 54 percent increase relative to the national average. And following the transition from Moi to Kibaki, a period in which secondary schooling rates declined overall, Kibaki's Kikuyu coethnics, along with the Kalenjin and the Luo, experienced the smallest reduction.[5] These patterns are highly suggestive of the

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[5]The fact that the Luo received such a large bump in their secondary schooling outcomes following the transition from Moi to Kibaki may be explained by the fact that the Luo were in a political coalition with the Kikuyu during the early years of the Kibaki presidency. We return to the issue of spillover of benefits to political coalition partners below.

Table 1: Average years of primary and secondary school completed, by ethnic group, time period and political regime.

Panel A: primary school years by decade

	Colonial	1960s	1970s	1980s	1990s	2000s	All years
Kalenjin	3.02	3.75	5.16	6.68	6.65	6.90	5.67
Kamba	3.37	4.86	5.86	6.92	6.88	6.97	6.11
Kikuyu	4.19	5.50	6.43	7.20	7.42	7.75	6.59
Luhya	3.86	4.44	5.65	6.74	6.68	6.84	5.98
Luo	3.18	3.97	5.46	6.87	7.04	7.21	5.97
Others	2.74	3.42	4.39	5.52	5.29	5.62	4.78
All Kenyans	3.38	4.25	5.39	6.48	6.42	6.59	5.71
Observations	4,678	4,820	13,265	15,701	11,002	3,659	53,136

Panel B: secondary school years by decade

	Colonial	1960s	1970s	1980s	1990s	2000s	All years
Kalenjin	0.18	0.32	0.61	0.94	0.86	0.79	0.76
Kamba	0.20	0.43	1.02	1.14	0.92	0.78	0.93
Kikuyu	0.31	0.70	1.42	1.46	1.36	1.29	1.31
Luhya	0.37	0.63	1.10	1.07	0.94	0.76	0.94
Luo	0.28	0.50	0.85	0.86	0.93	0.92	0.84
Others	0.33	0.50	0.80	0.91	0.84	0.65	0.78
All Kenyans	0.29	0.53	0.98	1.07	0.97	0.85	0.93
Observations	1,5038	3,823	10,575	15,146	13,938	8,140	53,136

Panel C: primary school years by political regime

	Kenyatta (1964–1978)	Moi (1979–2002)	Kibaki (2003–2008)	% change vis-à-vis national average	
				Kenyatta to Moi	Moi to Kibaki
Kalenjin	4.56	6.60	6.78	+15	+2
Kamba	5.44	6.85	6.63	−3	−4
Kikuyu	6.10	7.23	7.66	−11	+5
Luhya	5.18	6.67	6.64	−0	−1
Luo	4.87	6.87	7.00	+12	+1
All Kenyans	4.01	5.35	5.57		
Observations	14,924	30,887	2,636		

Panel D: secondary school years by political regime

	Kenyatta (1964–1978)	Moi (1979–2002)	Kibaki (2003–2008)	% change vis-à-vis national average	
				Kenyatta to Moi	Moi to Kibaki
Kalenjin	0.48	0.88	0.83	+54	+11
Kamba	0.76	1.02	0.76	+5	−8
Kikuyu	1.09	1.41	1.31	0	+11
Luhya	0.90	0.99	0.75	−20	−6
Luo	0.70	0.89	0.92	−2	+20
All Kenyans	0.67	0.86	0.61		
Observations	14,510	33,468	5,147		

Note: Children are coded as having attended primary or secondary school during a given period if they spent the majority of their school years (i.e., ≥ 4 years for primary; ≥ 2 years for secondary) during that period. The colonial era is the mid-1950s to 1963.

role that ethnic favoritism by the president may have played in shaping schooling outcomes in Kenya.

To test this claim more rigorously, we turn to individual-level data on school attainment. Our main independent variable, *presidential ethnic match*, is an indicator variable that takes a value of 1 if the individual was a member of the same ethnic group as the president during the time the individual attended primary (or secondary) school, and a value of 0 otherwise. Following Franck and Rainer (2012), we code this variable by connecting the ethnicity of the individual to the ethnicity of the president when the individual was between 6 and 13 years old for primary school and between 14 and 17 years old for secondary school.[6] Integrating a two-year time lag into our coding rule to account for the fact that policies put in place by a president are not likely to have an immediate impact (and that policies put in place by a president's predecessor are likely still to shape educational outcomes for a period of time after he has left office), we code a *presidential ethnic match* based on the ethnicity of the president when the respondent was aged 4–11 (for our primary schooling analyses) and 12–15 (for our secondary schooling analyses).[7] If a change in the president occurred during a child's primary or secondary school-aged years, the match is coded based on the ethnicity of the president who was in power for the majority of the time that the child was at that level of schooling (that is, for four or more years for primary and two or more years for secondary, subject to the two year lag).

A drawback of using the DHS data for our purposes is that the DHS surveys are administered to adults, whereas the outcome we are interested in, educational attainment, took place when the survey

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[6]The Kenyan primary education system is designed for students to begin at age six (or sometimes seven) and to last for 7 (until 1985) or 8 (after 1985) years. Primary school age is thus roughly age 6 to 13; secondary school age is roughly 14 to 17. To the extent that students delay entry into formal schooling or withdraw for a period and return when they are older, this will bias our analyses against finding an effect of ethnic favoritism. In coding the *ethnic match* variable, we use the self-reported ethnic group membership of the survey respondent in our main analyses. While the ethnic group categories used in the DHS surveys vary somewhat across the five survey rounds we employ, the categories for the ethnicities of each Kenyan president (Kalenjin and Kikuyu) are stable throughout, so these changes do not affect the coding of the *ethnic match* variable.

[7]Our results are robust to various changes in the lag (see Appendix A).

respondents were children or teenagers. Since a survey respondent's circumstances may have changed between childhood and the time that he or she was interviewed, we cannot use most of the rich individual- and household-level information that the DHS collects to control for the circumstances facing an individual's family at the time he/she was of school age. Our models are therefore by necessity spare, although we can and do control for the individual's gender, religion (Catholic, Muslim, or Protestant) and for whether the individual spent his/her childhood (and thus attended primary school) in a rural area, since the DHS collects information about this issue.

2   Empirical Strategy

A major challenge in estimating the impact of political favoritism on educational attainment is to isolate the effects of such favoritism from individual- and group-specific factors that might also affect schooling outcomes. For example, if we found that members of the president's ethnic group completed more years of primary schooling on average than members of other ethnic groups (as indeed we find under presidents Kenyatta and Kibaki — see Table 1), it would be difficult to know whether this association was a product of ethnic favoritism by the president or of deeper causes such as the group's earlier exposure to colonial education (Gallego and Woodberry, 2010; Nunn, 2011; Oyugi, 2000; Rothchild, 1969), its proximity to the national capital, its norms about girls' education, its higher than average wealth or greater job opportunities (both of which might affect the cost-benefit decisions families make about whether to send their children to school), or some other group-specific natural advantage.

Our strategy for solving this inferential problem is to leverage changes in the ethnicity of the president (which happened in 1978, when Kenyatta, a Kikuyu, was succeeded by Moi, a Kalenjin, and in 2002, when Moi was succeeded by Kibaki, a Kikuyu) and to run our models with ethnic group fixed effects, which control for unchanging group-specific factors that may predispose members of one group to over- or under-perform others.[8] This approach allows us to study the

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[8]Burgess *et al.* (2015), Franck and Rainer (2012), Jablonski (2014), Hodler and Raschky (2014) and Morjaria (2011) employ a similar strategy.

changing fortunes of each group over time, comparing the group's school attainment during periods when it has a president in the state house and when it does not, holding group-specific characteristics constant.

A potential concern is that the change in leadership may be endogenous to the rising educational fortunes of the new president's ethnic group. In the case of the transition from Kenyatta to Moi, this concern is minimized by the fact that Kenyatta's departure from power was caused by his death in office. Moreover, Moi was permitted to assume the presidency precisely because his ethnic group was viewed as economically and educationally backward, and his succession as unthreatening to Kikuyu interests (Branch, 2011; Hornsby, 2012). Moi's political opponents believed (incorrectly as it turns out) that this would make it easy for them to control him. Hence, Moi's ascension to the presidency cannot plausibly be attributed to the expanding educational attainment of his ethnic group. In the case of the transition from Moi to Kibaki, this concern looms larger. Indeed, as Arriola's (2012) analysis makes clear, financial support from well-educated Kikuyu business elites was central to Kibaki's electoral victory in 2002. However, the Moi-Kibaki transition plays only a small part of our analysis, and our results are unchanged if we drop the data from the Kibaki presidency.[9]

In addition to ethnic-group fixed effects, each model also includes year of birth fixed effects, whose inclusion helps to control for time-specific shocks that might impact primary education attainment differently across age cohorts. This might be an issue if, for example, a president's tenure in office coincided with a severe economic downturn that caused parents to keep their children home from school because they could not afford school fees or uniforms or so that the children could contribute to household income. In such a scenario, it would be impossible to separate out the impact of the president's efforts to help his group from the impact of the negative shock that happened to coincide with his presidency.[10] We also include robust standard errors

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[9]The lesser importance of the Moi-Kibaki transition stems from the fact the that most recent available DHS survey was conducted in 2008–2009, just five years after the start of the Kibaki presidency. This means that the number of individuals in our sample who had completed the majority of their primary or secondary school years under Kibaki is small — just under five and ten percent of our sample, respectively.

[10]Our results are also robust to the addition of both linear and quadratic ethnic group-specific time trends (see Appendix B). Including such group-specific time

clustered at the ethnic group-president level (since this is the level at which the treatment — presidential favoritism — is applied).[11] The equation we estimate is therefore

$$Y_{ijt} = \alpha + \theta M_{ijt} + \beta X_i + \gamma_j + \delta_t + \varepsilon_{ijt},$$

where Y_{ijt} is the educational outcome for the individual i in ethnic group j born in year t; M, our ethnic match indicator, takes a value of 1 if people from ethnic group j born in year t spent the majority of their primary or secondary school-aged years with a coethnic president; X is a vector of individual-level controls (gender, religion, born in a rural area); γ are ethnic group fixed effects; and δ are the year of birth (cohort) fixed effects. All models are estimated using OLS.[12]

3   Results

3.1   *Evidence for Presidential Ethnic Favoritism*

In column 1 of Table 2, we test for the impact of presidential ethnic favoritism on an individual's number of primary school years. The *presidential ethnic match* variable is statistically significant, with a point estimate of 0.36. The interpretation is that, controlling for an individual's religion, urban or rural upbringing, gender, ethnic group membership, and year of birth, having a president from one's own ethnic group in power during one's primary school years is associated with an

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trends would allow us to control for time-varying factors that affect school enrollment rates but that, due to ethnic groups' geographic segregation, economic specialization, or other factors, affect ethnic groups differently. For example, the boom in coffee prices in the mid-1970s raised income in Kikuyu areas (where coffee production is concentrated) but had a much smaller impact on the incomes of members of other ethnic groups. To the extent that household incomes are related to educational attainment, the coffee boom plausibly affected Kikuyu children's schooling outcomes more strongly than that of children from other ethnic communities. The inclusion of these group-specific time trends will, however, absorb some of the effects of having a coethnic president (which is, of course, another group-specific time varying factor), so we do not include them in our main specification.

[11]This is a conservative specification. Our results are identical in an alternate specification in which we cluster at the ethnic group-age cohort level (see Appendix C). The results are also robust to bootstrapped standard errors, as suggested by Bertrand *et al.* (2004).

[12]Appendix D replicates the main results using logistic regression.

Table 2: Presidential ethnic favoritism and primary education outcomes.

	(1) Primary years	(2) Primary years	(3) Primary attendance	(4) Primary attendance	(5) Primary completion	(6) Primary completion	(7) Primary years (census)	(8) Primary completion (census)
Presidential ethnic match	0.359*** (0.032)		0.054*** (0.008)		0.031*** (0.005)			
# of presidential ethnic match years		0.049*** (0.010)		0.008*** (0.001)		0.003** (0.001)		
District ethnic match							0.221*** (0.049)	0.018* (0.010)
Observations	47,275	47,275	47,275	47,275	47,275	47,275	3,236,101	3,236,101
R-squared	0.270	0.270	0.230	0.229	0.117	0.117	0.359	0.173

Robust standard errors, clustered at ethnic group-president level. Columns 1–6 include ethnic group fixed effects, age cohort (year-of-birth) fixed effects, and controls for childhood in rural area, gender, and religion. Columns 7–8 include district and age cohort (year-of-birth) fixed effects and standard errors clustered by district. All models are estimated using OLS. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

increase of just over a third of a year of primary schooling. This is a substantively meaningful effect: since the average Kenyan in our sample has 5.71 years of primary schooling, this is equivalent to a 6.3 percent increase in the number of primary school years that a child receives. In column 2, we revisit this result but redefine our ethnic match variable slightly to reflect the number of years (from among a child's seven or eight primary school-age years) in which a coethnic was president, and generate a nearly identical finding.[13]

Thus far, we have investigated the impact of having a coethnic president on the intensive margin: the number of years of primary schooling a child completes. In columns 3 and 4 of Table 2, we test for the impact of having a coethnic president on the extensive margin: the likelihood that a child has any primary schooling at all. We find here that having a coethnic president is associated with a 5.4 percent increase in the likelihood that a child attends at least some primary school. However, while just about all children start school, not everyone completes it, and the results in columns 5 and 6 suggest that having a coethnic president is associated with whether or not one does. Inasmuch as finishing primary school may be necessary for certain employment, this measure has the advantage of capturing something tangible and potentially important for real world outcomes. However, unlike the *primary years* variable, the primary completion measure cannot distinguish between children who completed six years of primary school and children who completed none, which may be quite important for the level of skills that a child acquires in school. In any case, the results are very similar: measured either in terms of whether a coethnic was president for a majority of one's primary school-age years (as in column 5) or in terms of the number of years in which a coethnic was president during one's primary school-age years (as in column 6), we find that having a president from one's own group in power is associated with a significant increase in a child's likelihood of having completed primary school.

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[13]The two operationalizations are identical for the majority of individuals whose primary school-age years coincide with the tenure of a single president (subject to the two year lag). Only in situations where an individual's primary school-age years occurred under two different leaders (as is the case for children born between 1974 and 1983 and after 1997) does the number of *presidential ethnic match* years variable generate a slightly different result, but this is a quite small share of our sample.

While primary schooling is critically important from a developmental standpoint and, as a consequence, is highly demanded, secondary education is perhaps even more powerfully associated with job opportunities. Space in secondary schools is also much more limited than space in primary schools. Hence, at least for those who have completed primary school, and thus qualify to continue their schooling, secondary school attendance may be even more powerfully subject to political (and ethnic) favoritism. Secondary schooling also has the advantage of being less affected by ceiling effects: even the group with the highest rates of secondary school attendance and completion, the Kikuyu (42 percent secondary school attendance rate and 25 percent secondary school completion rate), still have much room for improvement.

We test for the impact of having a coethnic president on secondary school attendance and completion in Table 3. Columns 1 and 2 report, using slightly different operationalizations of the dependent variable, that having a coethnic as president during one's secondary school-aged years is associated with the completion of an additional 0.12 years of secondary school. Given that the average Kenyan completes just 0.93 years of secondary school, this amounts to a 12.4 percent increase in secondary schooling years. We find, similarly, that individuals are 3.3 percentage points more likely to attend secondary school when they have a coethnic in power during their secondary school-age years (columns 3 and 4). We find no effect, however, of having a coethnic in the presidency on rates of secondary school completion (columns 5 and 6).

The size of these estimated effects are comparable to those reported in several education-related interventions in developing countries. For example, Miguel and Kremer (2004) find that administering de-worming drugs to Kenyan pupils decreases absenteeism by 7 percentage points. Evans *et al.* (2009) find that distributing free school uniforms increases attendance by about 6 percentage points. Duflo (2001) finds that each school constructed per 1000 children in Indonesia increases schooling by between 0.12 to 0.19 years. Schultz (2004) finds that the cash payments to parents under the PROGRESA program in Mexico increases enrollments by about 3 percentage points. And Angrist *et al.* (2002) find that a lottery in Colombia that randomly subsidized private schooling for some students increases completion of the eighth grade by 10 percentage points. The fact that ethnic favoritism by the president can generate effects on educational attainment that are roughly the same magnitude

Table 3: Presidential ethnic favoritism and secondary education outcomes.

	(1) Secondary years	(2) Secondary years	(3) Secondary attendance	(4) Secondary attendance	(5) Secondary completion	(6) Secondary completion	(7) Secondary years (census)	(8) Secondary completion (census)
Presidential ethnic match	0.115*** (0.036)		0.033*** (0.011)		0.010 (0.008)			
# of presidential ethnic match years		0.032*** (0.010)		0.009** (0.003)		0.003 (0.002)		
District ethnic match							0.016 (0.037)	0.005 (0.009)
Observations	46,042	46,042	47,275	47,275	47,275	47,275	3,402,305	3,430,909
R-squared	0.093	0.093	0.085	0.085	0.072	0.072	0.117	0.102

Robust standard errors, clustered at ethnic group-president level. Columns 1–6 include ethnic group fixed effects, age cohort (year-of-birth) fixed effects, and controls for childhood in rural area, gender, and religion. Columns 7–8 include district and age cohort (year-of-birth) fixed effects and standard errors clustered by district. All models are estimated using OLS. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

as interventions explicitly designed to improve schooling outcomes attests to the importance of the phenomenon we are studying.

3.2 Out of Sample Validation

To validate our main results outside of the DHS sample, we employ a 5 percent sample from each of Kenya's decennial censuses conducted between 1969 and 2009 (Minnesota Population Center, 2014). We include only individuals who were of primary or secondary school age after independence, giving us a total sample size of just over 3 million people. A disadvantage of the census data is that the Kenyan government withholds individual-level information about ethnicity due to its political sensitivity. Hence, we combine information about district-level ethnic demographics (gathered separately) with respondents' district of birth to create a *district ethnic match* variable. This measure captures whether or not each respondent was born in a district in which the majority ethnic group shared an ethnicity with the president during the respondent's school-age years.[14] Note that the use of census data (and district level outcomes) is less advantageous than the DHS data, which provides individual level estimates without making an ecological inference. However the census data has the advantage of dramatically increasing our sample size and providing an out of sample robustness test.

Columns 7 and 8 of Tables 2 and 3 present the main results (for primary/secondary school years and completion) from our analysis of the census data. Our estimates include controls for the respondent's gender and district of birth (which play a role in the analysis analogous to ethnic group fixed effects in the DHS specifications), along with age cohort fixed effects. Standard errors are clustered at the district level. This specification, which replicates the main specification in the Burgess *et al.* (2015) study of district-level road construction in Kenya, allows us to interpret the *district ethnic match* coefficient as the effect of being born in a district with an ethnic connection to the

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[14]Our analyses assume that the person attended primary school in his/her district of birth and that the person's admission to secondary schooling is affected by his/her district of origin. As in our other analyses, we use a two year lag in accounting for the president under whom individuals attended school. The results are robust to changes in this lag.

president. Consistent with our findings using the DHS data, we find that being born in a district with such a connection is associated with an increase in a child's primary schooling of 0.22 years and an increase in the probability of completing primary school of 1.8 percentage points (columns 7–8, Table 2). We find no statistically significant effects on secondary schooling using these data, however (columns 7–8, Table 3).

3.3   Narrowing the Window of the Analysis

As an additional, and particularly stringent, test, we narrow the window of our analysis to the period immediately before and after the political transitions from President Kenyatta to President Moi and from President Moi to President Kibaki. If the patterns described thus far are really due to presidents favoring their ethnic kin, then we would expect to see differences in the educational attainment of Kikuyu and Kalenjin children in the years immediately preceding and following these political transitions. We should see the educational attainment of Kalenjin children improve after Moi comes to power and decline after Kibaki takes over, and we should see the educational attainment of Kikuyu children drop when Moi takes office and then begin to rise again under Kibaki. To test whether this is the case, we narrow our sample to include only those individuals who would have started or finished primary or secondary school in the three years immediately before or after the two political transitions (subject to the two year lag).[15] We code respondents as being an ethnic match with the president based on the identity of the president when respondents were 6 or 14 years of age — the years they are likely to have started primary or secondary school, respectively. For the purposes of estimating the impact of having a coethinc president on school completion, we identify the year in which our *presidential ethnic match* variable switches from indicating a majority of primary or secondary school-age years under one president to a majority under the other. We then constrain the sample to include only the final three cohorts who would have spent a majority of their primary school-aged

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[15]Kenyatta died in August 1978, so we code Moi's first year in office as 1979. Kibaki won the 2002 election but did not take office until 2003. So we code his first year in office as 2003.

years under Kenyatta (Moi) and the first three cohorts who would have spent a majority of their primary school-aged years under Moi (Kibaki).

Table 4 presents the results for the Kenyatta-Moi transition. Column 1 presents the main results, with different outcomes presented in Panels A–D. We find that, even among children who would have started or finished their schooling during this narrow time window around the Kenyatta-Moi transition, an ethnic match with the president significantly increases the probability of completing primary school and attending secondary school.[16]

We also conduct a set of placebo tests. In a first set of tests, we replicate our analyses while "incorrectly" coding the Kenyatta-Moi transition as having occurred in 1976, three years before the de facto transition. In a second set of tests, we "incorrectly" code the transition as having taken place in 1982, three years after the de facto transition. If our main analyses are picking up real changes in educational attainment that result from having a coethnic in power, we should not find that our incorrectly coded ethnic match variables predict school attendance or completion. As the results in columns 2 and 3 demonstrate, they do not. Indeed, in the case of primary school completion (our strongest finding in this part of our analysis), the estimated effect of having a coethnic president is significant and negative if we "incorrectly" code the Kenyatta-Moi transition as having taken place three years later than it actually occurred.

In Table 5, we replicate these analyses for the Moi-Kibaki transition. Given that the most recent available DHS is from 2008–2009 and that individuals had to be at least 15 years old to have been included in the 2008–2009 DHS sample, we have no observations of individuals who started primary school after Kibaki came to power. We therefore are not able to examine primary school attendance in these analyses. We also have too few observations of individuals who would have completed primary school or attended or completed secondary school in three years before and after 2005 to carry out the second placebo test. We can, however, estimate the other outcomes of interest for the Moi-Kibaki

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[16]The results for primary school attendance, while substantively meaningful, fall just below traditional levels of statistical significance (at $p < 0.2$).

Table 4: Educational attainment around the Kenyatta-Moi transition.

	(1) Main analysis	(2) Placebo test	(3) Placebo test
Panel A: **primary** **attendance**	Attendance three years before and after transition	Attendance three years before and after 1976	Attendance three years before and and after 1982
Presidential ethnic match at age 6	0.015 (0.009)	0.010 (0.011)	−0.003 (0.005)
Observations	10,968	9,745	9,085
Panel B: **primary** **completion**	Completion three years before and after transition	Completion three years before and after 1976	Completion three years before and and after 1982
Presidential ethnic match (primary years)	0.025*** (0.009)	0.010 (0.015)	−0.015* (0.009)
Observations	8,159	8,911	8,782
Panel C: **secondary** **attendance**	Attendance three years before and after transition	Attendance three years before and after 1976	Attendance three years before and and after 1982
Presidential ethnic match at age 14	0.020* (0.012)	0.010 (0.020)	−0.002 (0.010)
Observations	8,083	7,718	8,771
Panel D: **secondary** **completion**	Completion three years before and after transition	Completion three years before and after 1976	Completion three years before and and after 1982
Presidential ethnic match (secondary years)	−0.006 (0.028)	−0.007 (0.039)	0.034 (0.022)
Observations	2,545	1,877	2,954

Each model includes age cohort fixed effects, ethnic group fixed effects, and the covariates included in Tables 2 and 3. Panel A, column 1 includes only those individuals who would have started school during the final three years of the Kenyatta era and the first three years of the Moi era. Panel B, column 1 includes the last three cohorts with a majority of their primary school-age years under Kenyatta and the first three with a majority of primary school-age years under Moi. Panel B also only includes those who attended any primary school. Panel C, column 1 includes only individuals who would have started secondary school during the final three years of the Kenyatta era and the first three years of the Moi era. Panel D, column 1 includes the last three cohorts with a majority of their secondary school-age years under Kenyatta and the first three with a majority of their secondary school-age years under Moi. Panel D also only includes those who attended at least some secondary school. Robust standard errors clustered by ethnic-group-year-of-birth in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 5: Educational attainment around the Moi-Kibaki transition.

	(1) Main analysis	(2) Placebo test
Panel A: **primary completion**	Completion three years before and after transition	Completion three years before and after 1999
Presidential ethnic match at age 6	0.078*** (0.028)	0.008 (0.030)
Observations	3,091	4,471
Panel B: **secondary attendance**	Attendance three years before and after transition	Attendance three years before and after 1999
Presidential ethnic match (primary years)	0.012 (0.038)	0.001 (0.022)
Observations	4,471	6,540
Panel C: **primary completion**	Completion three years before and after transition	Completion three years before and after 1999
Presidential ethnic match at age 14	0.183*** (0.036)	−0.166*** (0.021)
Observations	1,663	2,107

Each model includes age cohort fixed effects, ethnic group fixed effects, and the covariates included in Tables 2 and 3. Panel A, column 1 includes the last three cohorts with the majority of their primary school years under Moi and the first three with the majority under Kibaki (with no lag). Panel A also includes only those who attended at least some primary school. Panel B, column 1 includes only individuals who would have started secondary school during the final three years of the Moi era and the first three years of the Kibaki era. Panel C, column 1 includes the last three cohorts with a majority of their secondary school-age years under Moi and the first three with a majority of their secondary school-age years under Kibaki. Panel C also only includes those who attended at least some secondary school. Robust standard errors clustered by ethnic-group-year-of-birth in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

transition using this approach. We find strong effects on primary and secondary completion in column 1 and null or significant negative effects for the placebo tests in column 2. The fact that our main results hold up in these analyses for both transitions underscores the robustness of our findings.

3.4   Narrowing (and Broadening) the Definition of the Ethnic Group

In generating our *presidential ethnic match* variable, we followed standard practice in the literature and matched survey respondents and presidents based on the ethnic categories used in the DHS (which, in turn, adopted the standard ethnic categories used in the Kenyan census). Thus, Presidents Kenyatta and Kibaki were coded as Kikuyu and President Moi was coded as Kalenjin. However, Kenyatta and Kibaki were each from different Kikuyu districts, Kiambu and Nyeri, each with its own distinct client networks, clan identities, and political allegiances (Throup and Hornsby, 1998). And while Moi was indeed a Kalenjin, he came from a particular sub-tribe of that larger umbrella category, the Tugen, centered in Baringo district. So while it is reasonable to investigate whether Kenyatta and Kibaki favored the Kikuyu and whether Moi favored the Kalenjin — these, after all, are the broad, politically meaningful units to which most Kenyans expected to see resources channeled by these presidents — it is also reasonable to wonder whether the real favoritism might have been toward each president's sub-group.

To test this intuition, we return to the census data and conduct analyses in which we interact the district ethnic match variable with dummy variables indicating birth in each president's home district: Kiambu for Kenyatta, Baringo for Moi, and Nyeri for Kibaki. We focus on the census data because the sample size is large enough to provide the statistical power required to determine whether families living in each president's home district benefited disproportionately from presidential ethnic favoritism in the education realm. In the DHS sample, there are too few individuals from each of these districts to carry out this test.

Columns 1 and 2 of Table 6 present these results for our main outcomes of interest: years of primary and secondary schooling. Taking primary schooling outcomes first, we find that the positive effect on schooling attainment of living in a district dominated by the president's coethnics is magnified considerably if we look at the presidents' own home districts. Living not just in a Kikuyu-dominated district but in Kiambu (during Kenyatta's presidency) or Nyeri (during Kibaki's presidency) doubles and triples, respectively, the effect for Kikuyu children of having a Kikuyu in the statehouse. This home district effect is even greater under Moi. During the Moi presidency, children living

Table 6: Narrowing and broadening the definition of the ethnic group.

	(1) Primary years (census)	(2) Secondary years (census)	(3) Primary years (DHS)	(4) Secondary years (DHS)	(5) Primary years (DHS)	(6) Secondary years (DHS)
District ethnic match	0.156**	−0.002				
	(0.052)	(0.037)				
District ethnic match*Kiambu	0.159**	−0.122**				
	(0.061)	(0.051)				
District ethnic match*Baringo	0.615***	0.440***				
	(0.115)	(0.104)				
District ethnic match*Nyeri	0.293**	0.111				
	(0.120)	(0.157)				
Presidential ethnic match			0.365***	0.116***	0.362***	0.116***
			(0.024)	(0.035)	(0.029)	(0.035)
Ethnic coalition partner match			0.106***	0.006	0.018	−0.000
			(0.032)	(0.042)	(0.051)	(0.045)
Ethnic coalition partner match* Moi era					0.515**	0.019
					(0.188)	(0.040)
Observations	3,236,101	3,402,305	47,275	46,042	47,275	46,042
R-squared	0.359	0.117	0.287	0.094	0.287	0.094

Note: All models estimated using OLS. Columns 1 and 2 include district and age cohort (year-of-birth) fixed effects and standard errors clustered by district. Columns 3-6 include ethnic group fixed effects, age cohort (year-of-birth) fixed effects, and controls for childhood in rural area, gender, and religion, with robust standard errors clustered at ethnic group-president level. Columns 5-6 include a dummy for the Moi era. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

in Moi's home district of Baringo (largely members of Moi's Tugen sub-group) received an average of 0.8 years of additional primary schooling — a fivefold increase over children living in other Kalenjin districts.

Our examination of secondary schooling also generates interesting results. In the census-based analyses presented earlier, we found no effect on secondary schooling outcomes of living in a district dominated by the president's coethnics. However, when we narrow the focus to the president's own home district, we do find significant effects — but only under Moi. Specifically, we find that even though Kalenjin in general did not benefit in terms of their secondary schooling attainment, Kalenjin living in Barengo received an additional 0.4 years of secondary schooling during the Moi years. Kikuyu living in Nyeri or Kiambu, meanwhile, either received no additional bump from being in the president's home district or, as in the case of the latter, appear to have acquired fewer years of secondary schooling than other Kikuyu children. One reason for this difference (as well as the much greater home district effects for Moi's sub-group in the primary schooling analyses) may be that the broader Kalenjin ethnic identity is a relatively recent construction that resulted from coalition-building among linguistically similar and smaller ethnic groups living in the Rift Valley Province (Lynch, 2011). As a result, the cultural difference between Moi's group, the Tugen, and the other Kalenjin sub-groups may be more politically meaningful than is the difference between the Kikuyu clans.

"Ethnic" categories that extend beyond the ethnic group — often to include other groups from the same region or from the same broad language family — may also be relevant for understanding patterns of resource allocation (Ahlerup and Isaksson, 2015). While "Kikuyu" and "Kalenjin" may be meaningful ethnographic classifications, members of these communities tend to coalesce with other groups in politics (Hornsby, 2012). The Kikuyu have historically joined forces with the Embu and Meru in an ethnic political coalition called GEMA (for the Gikuyu-Embu-Meru Association, a cultural/political organization formed after independence to promote the interests of the Kikuyu and associated communities). The Kalenjin, meanwhile, have historically banded together with the Masaii, Turkana and Samburu in a group dubbed KAMATUSA (Kalenjin, Maasai, Turkana, Samburu). Hence, it is reasonable to inquire whether the favoritism we have documented

thus far might mask a broader pattern of favoritism toward the broader GEMA or KAMATUSA coalitions.

We investigate this possibility in columns 3 and 4 of Table 6 by adding an *ethnic coalition partner match* variable that captures whether the respondent was Embu or Meru under Kenyatta/Kibaki or Maasai, Turkana, or Samburu under Moi, and including this variable alongside *presidential ethnic match*.[17] The significant coefficient on this variable in column 3 indicates that ethnic coalition partners are, in fact, favored alongside the president's more narrowly defined coethnics, at least with respect to primary schooling. We find no evidence, however, that ethnic favoritism in secondary schooling extends to the broader ethnic coalition (see column 4).

If we break down the primary schooling results by presidential regime, as we do in column 5 through the addition of an interaction term, we see that all of ethnic coalition effect is coming from the Moi era (the *ethnic coalition partner match* coefficient is now zero). Whereas the children of Moi's Masai, Turkana and Samburu coalition partners benefit from his tenure, the children of Kenyatta and Kibaki's Meru and Embu partners would appear not to. A plausible explanation is that because President Moi was from a smaller ethnic group, he felt the need to redefine the boundaries of his support coalition to include other ethnic communities. Presidents Kenyatta and Kibaki, on the other hand, were members of Kenya's largest ethnic group and felt no such need to expand their ethnic coalition. These results validate Posner's (2004) argument that the desire to build viable political coalitions, not simply ethnographic similarity, is what drives patterns of redistribution in settings like Kenya.

3.5 Is This Just Catch-Up?

A potential concern with the findings we have presented thus far is that they stem not from ethnic favoritism but from the fact that the country we study happens to be one in which a president from an educationally advantaged group was replaced by a president from an educationally disadvantaged group. In such a situation, the increase in schooling of the less advantaged group in the second period could be simply due

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[17]Sample sizes are large enough when we pool members of the different groups to be able to return to the DHS data for these analyses.

to the natural process of catch-up, and this effect would be magnified if the educational attainment of the more advantaged group had reached an upper bound by the time of the transition.

Although these facts might seem to describe the Kenyan case, four pieces of evidence point against such an alternative account. First, although Kikuyu children had come close to reaching the ceiling on primary schooling by the time of the Kenyatta-Moi transition, they were nowhere near that ceiling with respect to secondary schooling. Thus the fact that our findings hold for both primary and secondary schooling is inconsistent with this explanation. Second, the results of the analysis in which we narrow the time window, in which we find a significant difference in the educational achievements of children from different ethnic groups in the three years immediately before and after each presidential transition, suggest that catch-up by disadvantaged groups (a long-term process) is unlikely to be responsible for our findings. Furthermore, the fact that the results are similarly strong across the both political transitions — the second being one from a president from a less-advantaged group to a president from a more advantaged group — is inconsistent with the catch-up thesis. Finally, the broad process of catch-up story would imply that we would find a *stronger* effect under President Moi than under President Kenyatta — especially in the area of primary education. While we do find that coethnics of President Moi acquired more years of secondary schooling under his tenure, we find the opposite with respect to primary schooling: where we find a difference in the degree of favoritism across political regimes (only in the area of primary school attendance), the advantage of having a coethnic president is less under Moi than under the other presidents (see Appendix E). So we think it is not likely that our results are generated by the peculiarities of the Kenyan case.

3.6   *Beyond the President*

The analyses discussed thus far focus on the role of the president in favoring his ethnic kin in the education sphere. In this respect, our contribution is similar to that of other studies that present findings about presidential ethnic favoritism in other sectors. Our analyses draw on significantly more data and involve a much larger number of specifications, but the basic relationships being investigated are similar.

However, a novel extension is to examine the usually overlooked, but in principle equally relevant, effect of a child's ethnic connection with the person who controls the ministry of education.[18]

The idea that ministers will favor their ethnic kin has broad currency among students of African affairs. Scholars such as Joseph (1987), van de Walle (2007), and Arriola (2009) emphasize the extent to which presidents keep themselves in power by co-opting other powerful elites — usually elites who control ethnic or regional support bases that are distinct from their own — by granting them access to portions of the state (what Joseph, following Weber, calls prebends) in exchange for their loyalty and that of their followers. In practice, this is done by allocating cabinet positions with the understanding that the holders of those positions will use them to enrich themselves and shore up their own regional or ethnic support bases, and then deliver votes to the president from those bases when called upon. To the extent that such a system operates in Kenya, we would expect to see coethnics not just of the president but also of the minister of education receive disproportionate benefits in the education sector — even when the president and minister are from different ethnic groups.

To test for evidence of such a prebendal strategy, we identify and code the ethnicity of every minister who has served in the Kenyan cabinet since independence and then test whether children who shared an ethnic group membership with the minister of education during their school years completed more years of schooling than other Kenyan children. As Table 7 makes clear, education ministers usually are from different ethnic groups than the president. They also tend to hold their posts for relatively short periods. We therefore estimate the impact on educational attainment of the number of years during which a coethnic served as the minister of education during a person's primary and secondary school-aged years, rather than whether a person had a coethnic as education minister during the majority of his or her primary

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[18]Burgess *et al.* (2015) are an exception to the rule that analyses of favoritism focus solely on the president. They explore the impact on road spending and paved road construction of having a coethnic minister of public works or controlling other important cabinet portfolios, and find no effect. They do, however, find an effect of having a coethnic vice president.

Table 7: Ethnicity of the minister of education.

Year(s)	President	Regime	President's ethnic group	Education minister's ethnic group
1963	Kenyatta	Multiparty	Kikuyu	Luo
1964–65	Kenyatta	Multiparty	Kikuyu	Kikuyu
1966–68	Kenyatta	Multiparty	Kikuyu	Mbeere
1969	Kenyatta	Single Party	Kikuyu	Kikuyu
1970–73	Kenyatta	Single Party	Kikuyu	Kalenjin
1974–76	Kenyatta	Single Party	Kikuyu	Kisii
1977–79	Kenyatta	Single Party	Kikuyu/Kalenjin	Kalenjin
1980	Moi	Single Party	Kalenjin	Luhya
1981–85	Moi	Single Party	Kalenjin	Kalenjin
1986–91	Moi	Single Party	Kalenjin	Luo
1992–97	Moi	Multiparty	Kalenjin	Kikuyu
1998–2000	Moi	Multiparty	Kalenjin	Kamba
2001–02	Moi	Multiparty	Kalenjin	Kalenjin
2003–06	Kibaki	Multiparty	Kikuyu	Masai/Kikuyu

or secondary schooling.[19] Panel A of Table 8 presents the results of our analysis. Controlling for our usual set of covariates as well as an individual's ethnic match with the president (which we continue to find to be associated with improvements in both primary and secondary schooling outcomes), we find that having a minister of education from one's ethnic group in office is associated with 0.06 more years of primary and 0.02 more years of secondary schooling for every year in which the coethnic holds that office (columns 1 and 4). This effect is slightly greater than, though not statistically different from, that of having a coethnic as president, corresponding to a roughly 7 percent increase in a child's primary school years and a 9 percent increase in a child's secondary school years if the minister of education is a coethnic during the whole of a child's school-aged years.[20] We also find evidence that the

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[19]Note that this strategy biases against finding an effect of having a coethnic serving as the minister of education, as we are including cases where the impact on educational attainment is likely to be quite small.

[20]We cannot entirely rule out the possibility that the appointment of a member of a particular ethnic group as the minister of education is endogenous to that group's

Table 8: Ministerial ethnic favoritism.

Panel A	(1) Primary years	(2) Primary attendance	(3) Primary completion	(4) Secondary years	(5) Secondary attendance	(6) Secondary completion
Presidential ethnic match (primary years)	0.360***	0.056***	0.027***			
	(0.025)	(0.008)	(0.004)			
Education minister ethnic match years (primary years)	0.056***	0.004*	0.008***			
	(0.017)	(0.002)	(0.002)			
Presidential ethnic match (secondary years)				0.122***	0.034***	0.012
				(0.036)	(0.011)	(0.008)
Education minister ethnic match years (secondary years)				0.022*	0.005*	0.004
				(0.011)	(0.002)	(0.003)
Observations	49,171	49,171	49,171	46,042	47,275	47,275
R-squared	0.297	0.249	0.129	0.093	0.085	0.072

(Continued)

Table 8: (Continued)

Panel B	(1) Primary years	(2) Primary years	(3) Primary years	(4) Primary years	(5) Primary years
Presidential ethnic match	0.335***	0.411***	0.341***	0.358***	0.487***
	(0.045)	(0.037)	(0.080)	(0.027)	(0.051)
Permanent secretary ethnic match	0.001				
	(0.011)				
Health minister ethnic match		0.035**			
		(0.015)			
Agricultural minister ethnic match			0.063		
			(0.066)		
Works minister ethnic match				0.015	
				(0.016)	
Finance minister ethnic match					−0.041**
					(0.017)
Observations	47,696	46,467	42,959	42,852	43,405
R-squared	0.300	0.303	0.323	0.303	0.305

Robust standard errors, clustered at ethnic group-president level. All models include ethnic group fixed effects, age cohort (year-of-birth) fixed effects, and controls for childhood in rural area, gender, and religion. All models are estimated using OLS. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

impact of having a coethnic minister of education extends to primary school attendance and completion (columns 2 and 3) and secondary school attendance (column 5), but not to secondary school completion.

Although ministers in Kenya have significant discretion over how their ministries' resources are allocated, day-to-day administration is in the hands of the permanent secretary, almost always a career civil servant appointed by the president. The salient ethnic match might therefore be with the permanent secretary. To test this hypothesis, we collected information on the ethnic backgrounds of all permanent secretaries in the ministry of education since independence and calculated, for each respondent, the number of primary school-age years in which a coethnic occupied that position. Although we find no effect (see Table 8, panel B, column 1), we cannot rule out that this is because permanent secretaries are operating as instruments of the president, keeping tabs on ministers who are not wholly under their control (Leonard, 1991; Thies, 2001). Indeed, between 1963 and 2005, there is a nearly perfect correlation between the ethnic background of the president and that of the permanent secretary of education.[21] So once we control for coethnicity with the president, we have no ability to detect an effect of having a coethnic permanent secretary.

The impact of having a coethnic in the cabinet may also extend beyond the minister of education. Educational attainment is a product not just of books, desks, and teachers but also of a student's health and nutrition, her family's income, and the community's access to basic infrastructure such as roads, electricity, and water. It follows that communal ties to the ministers who control these other outputs may also matter for educational attainment. Columns 2–5 of panel B examine this possibility by analyzing the impact on primary schooling of coethnicity with the ministers of health, agriculture, works, and finance

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need to catch up educationally, and hence an indicator of the government's decision to try to improve educational outcomes among that group's children rather than the cause of that improvement. However, given the way cabinet appointments are typically made in Kenya (as political payoffs), the frequency of cabinet reshuffles revealed in Table 7, and the fact that ministers often come from educationally advanced ethnic groups, we think this is unlikely.

[21] The only period in which a permanent secretary of education did not share the ethnic background of the president was between 1979 and 1986, when, for all but one year, the minister of education himself was a coethnic of the president (and therefore presumably did not need to be monitored).

during a child's primary school-age years. We find that only coethnicity with the minister of health is significantly associated with improvements in primary schooling outcomes. Sharing an ethnic link with the minister of finance is actually negatively associated with primary schooling outcomes.

Taken together, these findings suggest that, while an individual's ethnic connection with the president matters, so too does his or her ethnic connection with the minister in charge of allocating resources in the area in question (and sometimes in related areas as well). In keeping with the logic of prebendalism, ministers do, in fact, seem to have significant discretion in affecting the welfare of their ethnic kin — even when those kin are of a different ethnic group than the president.

3.7   The Impact of Regime Type

Our estimation strategy takes advantage of the fact that the ethnic affiliations of Kenya's presidents have varied over time. Another salient feature of Kenya's political landscape that has varied over time is the nature of its political institutions. Kenya began its post-independence life in 1963 as a multiparty regime but, by 1969, had become a de facto one party state. This single party era continued until the end of 1992, when popular pressure forced President Moi to reinstate multiparty elections. These shifts in formal political institutions, which occurred under both President Kenyatta and President Moi, make it possible to explore whether the patterns of ethnic favoritism identified thus far are affected by changes in regime type. We address this question by introducing a variable (*multiparty years*) that captures the number of an individual's primary or secondary school years that took place under a multiparty political system (1964–1969 or 1993–2008), and then testing to see how the ethnic favoritism of the president and the education minister is affected by this measure.

We interact the *multiparty years* variable with the *presidential ethnic match* and *education minister ethnic match years* variables. The results are presented in Table 9. In contrast to Burgess *et al.* (2015), who find that presidential ethnic favoritism in the allocation of roads in Kenya is strongly affected by regime type, but in keeping with the cross-national findings of Franck and Rainer (2012) and De Luca *et al.* (2015), we find no such evidence with respect to primary schooling and

Table 9: The impact of regime type.

	(1) Primary years	(2) Primary years	(3) Secondary years	(4) Secondary years
Multiparty years	0.505***	0.509***	−0.384***	−0.387***
	(0.040)	(0.037)	(0.082)	(0.090)
Presidential ethnic match	0.319***	0.355***	0.137***	0.132***
	(0.061)	(0.027)	(0.033)	(0.036)
Presidential ethnic match*multiparty years	0.028		−0.020*	
	(0.029)		(0.011)	
Education minister ethnic match years		0.067**		0.005
		(0.027)		(0.010)
Ed minister ethnic match years*multiparty years		−0.006		0.010*
		(0.006)		(0.005)
Observations	47,275	46,419	46,042	46,042
R-squared	0.270	0.273	0.093	0.093

Multiparty years are defined as years of schooling prior to 1969 or after 2002. Robust standard errors clustered by ethnic group-president in parentheses. Each model includes ethnic group fixed effects and controls for gender, religion, and childhood in a rural area. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

a weakly negative effect on secondary schooling — note the coefficient estimates on the interaction terms in columns 1 and 3. Where we do find (somewhat weak) evidence for a regime effect is with respect to the impact of having a coethnic minister of education, which is associated with a modest *increase* in the number of years of secondary schooling in a democratic setting (see column 4). The divergence between our findings and those of Burgess *et al.* (2015) underscores that patterns of distributive politics may vary substantially across outcomes, even within the same country (Kramon and Posner, 2013).[22]

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[22]Note that what changed in 1992 was the formal ability of multiple parties to compete for political power, not the degree of de facto competition in the political sphere. Most accounts of Kenyan politics suggest that real change in the competitiveness of the political system (and the emergence of something closer to real "democracy") did not occur until 1997, when Moi ran for re-election in a more open multiparty contest. Hence, in Appendix F, we test the robustness of the results reported in Table 9 to a pair of alternative measures of democracy: one using 1998 as the cut-off (the elections were not held until the very end of 1997); the other using the average POLITY score during a child's primary school-age years. The null findings on primary school years

In our earlier discussion of coalition politics, we speculated that the extension of primary schooling benefits to President Moi's broader ethnic coalition but not to President Kenyatta or Kibaki's stemmed from Moi's membership in a smaller ethnic group, which created incentives for him to expand his support coalition beyond his more narrowly defined kin community. These incentives may be especially strong in the multiparty era, since the size of a leader's coalition is more important when he needs it to win a competitive election. Figure 1, which plots the marginal effects on primary schooling years, primary attendance, and primary completion of being a member of the president's broad ethnic coalition in the Kenyatta/Kibaki and Moi eras during both multiparty and single-party periods, provides evidence that this is indeed the case.[23] For children whose primary school-age years took place completely under single-party rule (for whom the number of multiparty years is zero) being a member of the president's broader ethnic coalition is not associated with any change these outcomes. However, for children whose primary school years took place completely under multiparty rule (for whom the number of multiparty years is seven or eight), being a member of the president's broader ethnic coalition matters considerably — and differently under Moi and Kenyatta/Kibaki. Under Moi, membership in the broader ethnic coalition is associated with a significant increase in years of primary schooling, primary attendance, and primary completion, whereas under Kenyatta/Kibaki it is associated with a decrease. These results suggest that the findings reported earlier about the impact of being a member of the president's broader ethnic coalition were driven not just by the president (and, plausibly, the size of his ethnic group) but also by the nature of the political institutions under which he was operating. The results underscore that regime type may affect not just the degree of ethnic favoritism — a topic also explored by other researchers — but also the ways in which the groups to which that favoritism is targeted are defined by political actors. For leaders from small ethnic communities, multiparty competition creates incentives to redefine the boundaries of the ethnic community so as to make it more encompassing.

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are unchanged in these two alternative specifications, and the weak secondary school findings on favoritism by the education minister disappear.

    [23]There was, of course, no single-party era under Kibaki.
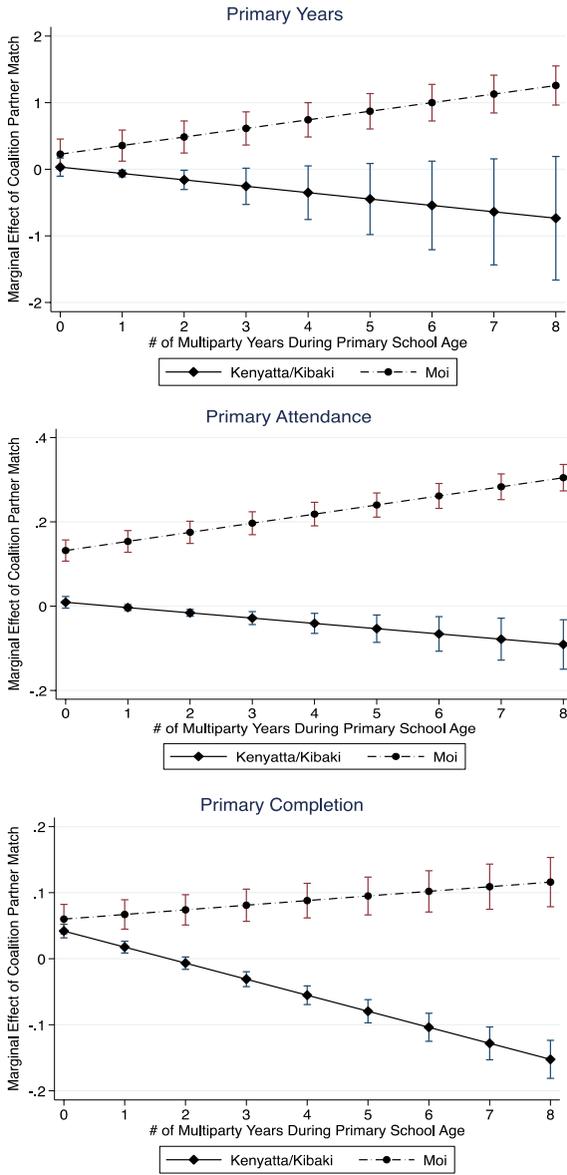
Figure 1: Marginal Effects of a Coalition Partner Match Under Kenyatta, Kibaki and Moi During Multiparty and Single-Party Rule.

4 Why Does Having a Coethnic in a Position of Political Power Matter for Educational Attainment?

What is the precise mechanism that links schooling outcomes with having a coethnic occupying the presidency or serving as the minister of education? In the case of favoritism with respect to road building or the provision of other infrastructure, the linkage is fairly straightforward since the outcome in question is largely a product of government allocation decisions. However in the realm of education, the link between political actors' decisions and observed outcomes is more complex and multifaceted. In the discussion that follows, we distinguish between three broad channels. The first emphasizes the greater supply of educational inputs to the president's or minister of education's coethnics. The second emphasizes the indirect effect on educational outcomes of favoritism by the president or other ministers in other domains. The third emphasizes the ways in which having a coethnic president or minister of education may affect the demand for education from among the officeholder's kin.

4.1   The Supply of Educational Inputs

With respect to the supply side, the most straightforward mechanism is preferential access to educational inputs such as schools, teachers, desks, books, or other materials. These inputs may be channeled directly to coethnics through the allocation of government funds or they may come indirectly through the president's or minister's donations to Harambee (self-help) groups. Such groups have played a central role in fundraising for educational infrastructure in Kenya and often receive substantial contributions from senior government officials (Hornsby, 2012; Widner, 1993). To the extent that presidents and ministers are able (and expected) to make large donations to Harambee campaigns, their coethnics may benefit disproportionately.

Unfortunately, comprehensive data on budgetary allocations for educational inputs or records of Harambee contributions are not available. To examine the evidence in favor of this mechanism, we therefore rely on data gathered from District Development Reports on the number of primary schools in each district at five-year intervals between 1974 and 2001 — a reasonably proxy for more general patterns of education

spending. We combine this information with population data from the most proximate Kenyan census to calculate the number of primary schools in each district per 1,000 residents for each five-year period. We then create a *district ethnic match* variable that captures whether (based on district-level ethnic demographic data from each Kenyan census held since 1969) the majority of the residents of the district were of the same ethnic group as the president at the time the schools were counted, and we regress the number of primary schools per 1,000 residents on this indicator measure. We include year fixed effects to control for year-specific shocks that might impact school construction, district fixed effects to insure that our comparisons are picking up changes over time within districts, and we cluster standard errors at the district level. Our total sample for the analysis is 232 district-years.

As we show in Table 10, districts in which the majority of residents share an ethnic connection with the president have about 0.17 more schools per 1,000 residents. This effect corresponds to about 45 additional primary schools in the median district — roughly a 20 percent increase. These results suggest that the targeting of education inputs by presidents to their coethnics is certainly part of the story.

Further evidence in favor of the supply mechanism is provided in Figure 1, discussed earlier, where we showed that ethnic coalition partners were favored more heavily by Moi in the democratic era. This is

Table 10: Ethnic favoritism in primary school construction.

	Primary schools per 1,000 residents
District ethnic match	0.172*
	(0.098)
Constant	0.916***
	(0.116)
Observations	232
R-squared	0.458

Unit is the district-year. Dependent variable is the number of schools per 1,000 residents. District is coded as an ethnic match if the majority ethnic group shares an ethnicity with the president. Model includes district and year fixed effects. Robust standard errors in parentheses, clustered at the district level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

consistent with a supply mechanism for two reasons. First, we attribute
the result to Moi's need to build a larger coalition to contest multiparty
elections, which suggests that favoritism is being driven by strategic
allocations from the government. Second, it is highly unlikely that
members of Moi's broader ethnic coalition would experience significant
changes in the demand for education following democratization. Demand
mechanisms, which we discuss below, are therefore unlikely to explain
why the beneficiaries of ethnic favoritism shift following the transition
to more democratic politics.

4.2   Indirect Effects on Non-Educational Inputs

Coethnic favoritism may also impact schooling outcomes indirectly
through its effect on non-educational inputs that make it more likely that
children will stay in school. For example, having a coethnic president
or cabinet minister may lead to improvements in health and nutrition
(Franck and Rainer, 2012), which may improve pupil attendance and
make it more likely that children will progress up the educational ladder
(Alderman *et al.*, 2006; Martorell *et al.*, 2010; Miguel and Kremer,
2004). Or it may lead to increases in income among the president's or
minister's coethnics, which may make it easier for parents to pay school
fees, purchase school uniforms, or forego their children's labor in the
family's farm or business.

   We find mixed evidence for this indirect channel. On the one hand,
we find in Table 8, panel B that having a coethnic minister of health
is associated with more an additional 0.04 years of primary schooling
(or about an additional quarter of a year of primary schooling if the
coethnic occupies the health ministry during the whole of a child's
primary school-age years). On the other hand, however, we find no
relationship between primary schooling and having a coethnic controlling
the ministries of agriculture, works, or finance (the estimated impact of
having a coethnic minister of finance is, in fact, negative).

   In addition, we find no evidence that having a coethnic president
during one's childhood years is associated with better health or nutrition
outcomes. To test for this relationship, we employ information collected
in the DHS on female adult heights and infant survival rates, both of
which are highly correlated with health and nutrition during a child's

early years (Moradi, 2009; Silventoinen, 2003).[24] Using a similar ethnic group fixed effect set-up to ours, Franck and Rainer (2012) find a strong relationship between presidential coethnicity and infant survival in a cross-section of African countries. Our results, however, provide no evidence that Franck and Rainer's general findings hold in Kenya.[25] Nor do we find that the relationship holds when we examine female adult heights.[26] As we show in Table 11, having a coethnic president

Table 11: General improvements in well-being?

	(1) Infant survival	(2) Female adult height (cms)
Presidential ethnic match at childbirth	−0.090 (0.066)	
Number of ethnic match years age 0-4		0.025 (0.072)
Observations	116,122	20,267

Models include ethnic group and year of birth fixed effects. All models include robust standard errors, clustered at the ethnic group-president level. The infant survival model includes infant birth-year fixed effects, and controls for the gender of the infant, the birth order and its square, whether the birth was a multiple birth (twin, triplet, and so on), and the age of the mother and the age of the mother squared. Both ethnic match variables are lagged two years. The results are the same without the lag. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

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[24]To calculate group-specific infant mortality rates from the DHS data, we construct a dataset where the unit of observation is the live birth and where infant mortality is defined as death in the first twelve months of life. Using live births as the unit of analysis takes advantage of the fact that DHS collects retrospective information about all live births to adult females in the household, as well as information about each child's current mortality status (including the date of death, if applicable). Because each adult female household member reports multiple live childbirths, each in different years, this strategy permits us to generate annual estimates of infant mortality with a sample size that greatly exceeds that of the DHS sample itself (hence the very high number of observations in our analysis).

[25]Neither, it happens, do Franck and Rainer (2012), who provide country-by-country breakdowns of their analysis and show that Kenya is one of several countries that do not exhibit this general trend.

[26]Our analysis includes ethnic group fixed effects to control for group-specific genetic differences that might lead to cross-group variation in average heights.

at the time of a child's birth or during the child's first four years of life is not associated with either the likelihood that the child will die before reaching age one or, if she is a girl, her adult height.[27] These results cast doubt on the idea that presidents affect their coethnics' educational attainment indirectly via favoritism in other domains.

4.3   The Demand for Education

The president's ethnicity might also matter because of its impact on the demand for education. Education is a substantial, long-term investment that is made (or not) in view of its anticipated returns. A family's ethnic ties to the president or other high office holders may matter for this calculation by affecting perceptions about future job opportunities (Barkan and Chege, 1989; Wrong, 2009) — especially in the public sector, which, through the early 1990s, was the major source of formal employment in Kenya. Indeed, survey evidence suggests that 80 percent of Kenyans perceive that a person's ethnicity will affect his access to public sector jobs (KIPPRA Research Team, 2012). Combined with research that shows that perceptions about future returns to schooling are strongly associated with investments in schooling (Jensen, 2010), this public opinion data suggests the plausibility of the demand mechanism.

Since the public sector in Kenya has historically been dominated by men (Suda, 2002), investments in education made in light of expectations of benefitting from an ethnic tie should vary by gender. We can therefore evaluate the demand mechanism by investigating whether the effect on schooling outcomes of having a coethnic president is stronger for boys than for girls. We do this in the first six columns of Table 12, where we interact a dummy variable for whether the child was male with our dummy for *presidential ethnic match*. With the exception of one outcome, primary attendance (where we actually find modestly *lower* levels among boys), our results provide no support for this hypothesis.

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[27]A potential weakness in this analysis is that if infant mortality coincides with maternal mortality, we will not observe those cases of infant mortality in our data. Similarly, severe malnourishment in early childhood may lead not just to lower adult height but also reduced life expectancy, in which case we will again not observe some cases in our sample. However, these missing observations would only inflate our estimates of ethnic favoritism if coethnics of the president are *more* likely to experience maternal mortality or to have lower life expectancy, which we believe is unlikely.

Table 12: The impact of having a coethnic president, by gender.

	(1) Primary years	(2) Primary attendance	(3) Primary completion	(4) Secondary years	(5) Secondary attendance	(6) Secondary completion	(7) Primary years	(8) Primary attendance	(9) Primary completion	(10) Secondary years	(11) Secondary attendance	(12) Secondary completion
Male	0.801***	0.099***	0.131***	0.488***	0.114***	0.099***	0.765***	0.085***	0.145***	0.574***	0.123***	0.122***
	(0.189)	(0.026)	(0.026)	(0.047)	(0.016)	(0.007)	(0.149)	(0.021)	(0.020)	(0.039)	(0.013)	(0.007)
Presidential ethnic match	0.411***	0.063***	0.033***	0.126***	0.036***	0.011	0.356***	0.057***	0.028***	0.152***	0.033***	0.018*
	(0.066)	(0.008)	(0.009)	(0.044)	(0.013)	(0.010)	(0.062)	(0.006)	(0.007)	(0.038)	(0.011)	(0.009)
Presidential ethnic match *male	−0.222	−0.039*	−0.009	−0.048	−0.013	−0.003	−0.177	−0.030*	−0.008	−0.022	0.011	−0.004
	(0.184)	(0.022)	(0.026)	(0.064)	(0.019)	(0.014)	(0.128)	(0.017)	(0.033)	(0.054)	(0.020)	(0.005)
Multiparty years* male							0.019	0.007**	−0.008*	−0.047***	−0.005*	−0.013***
							(0.026)	(0.003)	(0.004)	(0.012)	(0.002)	(0.003)
Presidential ethnic match* multiparty years* male							−0.030	−0.004	−0.003	−0.014	−0.013	0.002
							(0.074)	(0.007)	(0.018)	(0.039)	(0.011)	(0.007)
Observations	47,275	47,275	47,275	46,042	47,275	47,275	47,275	47,275	47,275	46,042	47,275	47,275
R-squared	0.270	0.230	0.117	0.093	0.085	0.072	0.271	0.231	0.117	0.094	0.085	0.074

Robust standard errors, clustered at ethnic group-president level. All models include ethnic group fixed effects, age cohort (year-of-birth) fixed effects, and controls for childhood in rural area, gender, and religion. In columns 7-12, multiparty years does not enter the model individually because the variable is perfectly correlated with the age cohort fixed effects. We can, however, still estimate the interaction effects. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

A second piece of evidence against the demand channel can be found in the results reported earlier in Table 3, which explored the impact of a coethnic tie with the president on secondary schooling outcomes. Job opportunities are better for children who finish their secondary schooling than for those who do not. So if parents invest in their children's education so as to take advantage of a coethnic tie with the person controlling the government, then we would expect to see the strongest effects for secondary school completion. The fact that we find an effect of having a coethnic president on secondary school attendance but not on secondary school completion (see Table 3) is thus inconsistent with this story.

Our strong findings regarding the impact of having a coethnic minister of education can also not be explained by expectations about future job opportunities since it is unlikely that parents will think that the minister of education, whose predominant employees (teachers) are not selected directly by the ministry, will have the significant discretion over hiring.[28] The fact that we find no relationship between schooling outcomes and having a coethnic controlling the ministries of agriculture or works — two ministries that hire many workers without advanced degrees — is also inconsistent with the demand thesis (see panel B of Table 8).

Finally, if parents condition their investments in their children's schooling on the likelihood that a coethnic leader will still be in power when their children are ready to enter the job market, then it is reasonable to assume that they will be more likely to do this if they think the leader will remain in power for some time. Such a belief is plausibly more likely in a non-democratic setting, since leaders in autocracies tend to stay in office longer than leaders in democracies (Chiozza and Goemans, 2004; Kono and Montinola, 2009; Marinov, 2005). Since male children are more likely to be candidates for jobs than female children, we might therefore expect to see a negative sign on the triple-interaction among *presidential ethnic match, male and multiparty years*. The fact that we do not see this in Table 12 (see columns 7–12) is therefore another piece of evidence that is inconsistent with the demand mechanism logic.

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[28]Teachers in Kenya are hired as civil servants through the Teacher's Service Commission (Duflo *et al.*, 2015).

4.4 Other Channels

Although the evidence is somewhat mixed, our results provide somewhat more support for supply- than demand-side mechanisms. There are, however, additional channels that our current data do not permit us to evaluate. For example, children may benefit from having coethnics in power not because of the greater amount of funding they are allocated but due to the efficiency with which these funds are translated into concrete outputs. Leakage and inefficiency are major problems in the education sector in African countries (Das *et al.*, 2003; Reinikka and Svensson, 2004). However, when presidents and ministers share an ethnic connection with the agents who implement education policies at the local level, they may be better able to monitor these agents' activities, and this may lead to less wastage and better outcomes.[29] Coethnic elites and agents may also be better able to cooperate (Habyarimana *et al.*, 2009) or may share similar preferences about education policy and its implementation (Lieberman and McClendon, 2013), which could also generate improved schooling outcomes.

Alternatively, having coethnics occupying senior government positions — especially the presidency — may matter by inspiring children from that group to succeed. Research in the United States suggests that Barak Obama's rise to national prominence, and eventually to the White House, had a positive effect on the school performance of traditionally underperforming African American children, who view him as a role model (Marx *et al.*, 2009). It is possible that similar dynamics lie behind the association we find in Kenya between having a coethnic president and school attainment among Kenyan children.

5 Implications

How should we think about the substantive importance of our findings? Since education affects other critical life outcomes, one way of answering this question is to estimate the impact of ethnic favoritism on these other outcomes *through its effect on schooling*. To do this, we draw on

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[29]The logic here echoes Kasara's (2007) argument about the greater efficiency of interactions between coethnic elites and agents in the area of tax collection. On the other hand, leaders may turn a blind eye to leakage in their home areas, knowing that local coethnic elites are the ones who are benefiting.

the results of a study that exploits the increase in the number of primary school years in Kenya from seven to eight in 1985 to estimate the causal effect of an additional year of primary schooling (Kramon, 2012). We combine our estimate of the impact of having a coethnic president on years of primary schooling (from column 1 of Table 2) with Kramon's estimates of the impact of primary schooling on infant mortality, age at first childbirth, total fertility and formal employment. We estimate that, through its effect on schooling, having a coethnic president during one's primary school years increases a woman's age at first childbirth by about 0.37 years, raises the probability that her children will survive their first year by 0.01 percentage points, and decreases her total fertility by about 0.42 children. In addition, we estimate that having a coethnic as president during one's primary school years increases the probability of formal employment later in life by about 10 percentage points (analyses available upon request). These are large effects, and they underscore the substantive importance of ethnic favoritism in the education sector.

Another way of thinking about the import of our results is to consider the share of an ethnic group's overall gains in educational attainment that can be attributed to ethnic favoritism. For example, we estimate that an ethnic match with the president increases the average number of primary school years that a child receives by 0.36 years. During the Kenyatta era, the average years of schooling among the Kikuyu increased from 4.6 to 6.1 years. An ethnic match therefore accounts for about 23 percent of this 1.5-year increase. During the Moi era, average years of schooling among the Kalenjin increased by 2.5 years (from 4.2 to 6.7 years). The ethnic match accounts for about 14 percent of this increase.

A third way of thinking about the impact of our findings is in terms of the broader impact of ethnic favoritism on Kenyan politics and society. Survey data reveal strong expectations of ethnic bias by state actors, with perceptions of fair treatment by the government strongly associated with whether or not the respondent is a member of the president's ethnic group (Afrobarometer, 2008). Although these perceptions are no doubt driven by factors that go beyond ethnic favoritism in educational attainment, inequality in the education sphere does nothing to weaken these perceptions, and quite likely reinforces them.

Perceptions of ethnic favoritism in the distribution of government resources have a number of important consequences. First, they

undermine trust between ethnic groups, which may have implications for market integration, collective action, and economic growth (Beugelsdijk *et al.*, 2004; Knack and Keefer, 1997; Robinson, 2013). Second, they substantially raise the stakes of presidential elections, as people fear exclusion from future benefits in the event that the candidate associated with their group is defeated. This has led to the emergence of a "do or die" mentality surrounding elections in Kenya (Mueller, 2011), which, in turn, generates incentives for vote-buying, electoral fraud, and other forms of election- (and non-election-) related corruption (Kramon, forthcoming; Wrong, 2009). High stakes elections can also fuel election violence. Most recently, this was manifested in the conflict that killed over 1,000 people and displaced roughly 700,000 after the disputed elections of 2007. Though the proximate cause was a dispute over the true winner of the election, the underlying grievances that facilitated the violence were related to perceptions of biased and inequitable distribution of resources across Kenya's ethnic groups. Thus, to the extent that ethnic favoritism in the education sector contributes to the perception that power-holders will discriminate on behalf of their kin, it may undermine development by generating mistrust, corruption, and instability.

6   Conclusion

Kenyan politics — like that of many developing countries — has long been characterized by favoritism of coethnics by political leaders. In this paper we document this phenomenon in the education sector by taking advantage of data on the primary and secondary school attainment of more than 50,000 Kenyans over five decades. Controlling for an array of individual- and group-specific determinants of educational attainment, and leveraging changes in the ethnic backgrounds of Kenyan presidents over time, we find a strong and robust relationship between schooling outcomes and whether or not a coethnic occupied the presidency during a person's school-age years.

Our deep examination of the Kenyan case has allowed us to advance the existing literature in a number of ways. First, we investigate the impact of kinship ties with political actors other than the president. It is well established that African presidents often allocate cabinet

positions to members of other ethnic groups in order to maintain their political coalition. Yet there is no empirical evidence on the distributive consequences of this strategy. This is an important omission because it could be that such appointments are mere window dressing with no real effect on the fortunes of the people who those ministers are ostensibly representing in the government. We show that having a minister of education from one's ethnic group is positively associated with both primary and secondary school attainment — evidence that cabinet positions come with real power to impact distributive politics.

Second, we explore how democratization affects ethnic favoritism. A number of studies ask how overall levels of public goods provision and wellbeing vary with regime type. Fewer ask how the transition from single-party to multi-party rule affects the way those public goods are distributed. We show, perhaps surprisingly (and in contrast to Burgess et al 2015), that ethnic favoritism by Kenyan presidents and ministers of education has persisted, and been of roughly the same magnitude, in the country's single- and multi-party eras. We do find, however, that democratization impacts the composition of the group that the president favors. Specifically, we find that the president of a small ethnic group expands favoritism to include members of closely related ethnic groups in the multiparty era. We interpret this finding as resulting from the incentives of electoral competition: in the multiparty era, leaders of smaller ethnic groups have incentives to broaden the definition of the "group" in order to enhance their electoral prospects. This result underscores the extent to which political strategy, rather than ethnolinguistic affinity, drives patterns of ethnic favoritism.

Third, we examine the mechanisms that lie behind these patterns. Our analyses suggest that the relationship between schooling outcomes and coethnicity is driven by targeted spending toward the president and minister's ethnic groups(s), not by the spillover of favoritism in other domains or by expectations of future job opportunities.

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Appendix

Appendix A: *Presidential ethnic match* and *presidential ethnic match years* coefficients with different lags and different models.

	(1) No lag	(2) 1 year	(3) 2 years	(4) 3 years	(5) 4 years
DV: primary years	0.385***	0.384***	0.359***	0.306***	0.284***
IV: dichotomous ethnic match	(0.055)	(0.053)	(0.054)	(0.058)	(0.057)
DV: primary completion	0.040***	0.035***	0.031***	0.020*	0.016
IV: dichotomous ethnic match	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
DV: primary attendance	0.053***	0.054***	0.054***	0.050***	0.049***
IV: dichotomous ethnic match	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
DV: primary years	0.061***	0.056***	0.049***	0.047***	0.044***
IV: ethnic match years	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
DV: primary completion	0.005***	0.004***	0.003**	0.002	0.002
IV: ethnic match years	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DV: primary attendance	0.009***	0.009***	0.008***	0.008***	0.008***
IV: ethnic match years	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Primary years (Poisson model)	0.088***	0.087***	0.083***	0.072***	0.067***
IV: dichotomous ethnic match	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Primary years (Poisson model)	0.014***	0.013***	0.012***	0.011***	0.010***
IV: ethnic match years	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DV: secondary years	0.101**	0.120***	0.115***	0.105***	0.101***
IV: dichotomous ethnic match	(0.039)	(0.036)	(0.035)	(0.034)	(0.034)
DV: secondary completion	0.008	0.015*	0.010	0.011	0.008
IV: dichotomous ethnic match	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)
DV: secondary attendance	0.031***	0.035***	0.033***	0.031***	0.027***
IV: dichotomous ethnic match	(0.011)	(0.010)	(0.010)	(0.009)	(0.009)
DV: secondary years	0.028***	0.032***	0.032***	0.032***	0.030***
IV: ethnic match years	(0.011)	(0.010)	(0.009)	(0.009)	(0.009)
DV: secondary completion	0.002	0.004	0.003	0.004*	0.003
IV: ethnic match years	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
DV: secondary attendance	0.009***	0.010***	0.009***	0.009***	0.008***
IV: ethnic match years	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)

Rows 1–6 replicate columns 1, 5, 3, 2, 6, and 4 in Table 2, respectively, using different lag coding rules. Rows 7–8 replicate columns 1 and 5 in Table 2 using a Poisson count model, rather than an OLS regression model. Rows 9–14 replicate columns 1, 5, 3, 2, 6, and 4 in Table 3, respectively, using different lag coding rules. Robust standard errors in parentheses, clustered at the ethnic group-president level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix B: Robustness to different group-specific time trends.

	(1) Linear group-specific time trends	(2) Quadratic group-specific time trends
DV: primary years	0.291**	0.121**
IV: dichotomous ethnic match	(0.126)	(0.051)
DV: primary completion	0.054***	0.039***
IV: dichotomous ethnic match	(0.016)	(0.010)
DV: primary attendance	0.030**	0.013*
IV: dichotomous ethnic match	(0.014)	(0.006)
DV: primary years	0.055***	0.055**
IV: # of ed. minister match years	(0.013)	(0.021)
DV: secondary years	0.086*	0.161***
IV: dichotomous ethnic match	(0.048)	(0.040)
DV: secondary completion	0.001	0.020**
IV: dichotomous ethnic match	(0.012)	(0.009)
DV: secondary attendance	0.034***	0.049***
IV: dichotomous ethnic match	(0.009)	(0.011)

Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Appendix C: Robustness to different ways of clustering the standard errors.

	(1) Ethnic group- age cohort	(2) Ethnic group- president
DV: primary years	0.359***	0.359***
IV: dichotomous ethnic match	(0.054)	(0.032)
DV: primary years	0.049***	0.049***
IV: ethnic match years	(0.008)	(0.010)
DV: primary completion	0.031***	0.031***
IV: dichotomous ethnic match	(0.010)	(0.005)
DV: primary completion	0.003**	0.003**
IV: ethnic match years	(0.002)	(0.001)
DV: primary attendance	0.054***	0.054***
IV: dichotomous ethnic	(0.007)	(0.008)
DV: primary attendance	0.008***	0.008***
IV: ethnic match year	(0.001)	(0.001)
DV: secondary years	0.115***	0.115***
IV: dichotomous ethnic match	(0.035)	(0.036)
DV: secondary years	0.032***	0.032***
IV: ethnic match years	(0.009)	(0.010)
DV: secondary completion	0.010	0.010
IV: dichotomous ethnic match	(0.008)	(0.008)
DV: secondary completion	0.003	0.003
IV: ethnic match years	(0.002)	(0.002)
DV: secondary attendance	0.033***	0.033***
IV: dichotomous ethnic	(0.010)	(0.011)
DV: secondary attendance	0.009***	0.009**
IV: ethnic match year	(0.003)	(0.003)

Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Note: Clustering of standard errors does not impact coefficient estimate, just the standard errors.

Appendix D: Robustness to estimation using logistic regression.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Primary attendance	Primary attendance	Primary completion	Primary completion	Primary completion (census)	Secondary attendance	Secondary attendance	Secondary completion	Secondary completion	Primary attendance	Primary completion	Secondary attendance	Secondary completion
Presidential ethnic match	0.117 (0.234)		0.143*** (0.020)		0.106*** (0.051)						0.119*** (0.015)		
# presidential match years		0.011 (0.038)		0.016*** (0.006)									
Presidential match secondary years						0.181*** (0.051)		0.182*** (0.052)				0.189*** (0.051)	0.193*** (0.051)
# of presidential match years, secondary							0.050*** (0.015)		0.049*** (0.016)				
Education minister match years										0.071 (0.066)	0.028** (0.013)		
Education minister match yrs, secondary												0.028** (0.012)	0.031 (0.020)
Observations	47275	47275	47275	47275	3,236,101	47275	47275	47275	47275	49171	49171	47275	47275

Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Appendix E: Presidential ethnic favoritism under Kenyatta v. Moi.

Primary education.

	(1) Primary years	(2) Primary years	(3) Primary attendance	(4) Primary attendance	(5) Primary completion	(6) Primary completion
Presidential ethnic match	0.326*** (0.062)		0.069*** (0.006)	0.029** (0.011)		
# of presidential ethnic match years		0.049*** (0.011)		0.011*** (0.001)		0.003* (0.002)
Presidential ethnic match* Moi era	0.089 (0.131)		−0.038*** (0.011)		0.003 (0.021)	
Ethnic match years* Moi era		−0.000 (0.022)		−0.007*** (0.001)		0.000 (0.003)
Observations	47,275	47,275	47,275	47,275	47,275	47,275
R-squared	0.270	0.270	0.230	0.230	0.117	0.117

(*Continued*)

Robust standard errors, clustered at ethnic group-president level. All models include ethnic group fixed effects, age cohort (year-of-birth) fixed effects, and controls for childhood in rural area, gender, and religion. All models are estimated using OLS. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Secondary education.

	(1) Secondary years	(2) Secondary years	(3) Secondary attendance	(4) Secondary attendance	(5) Secondary completion	(6) Secondary completion
Presidential ethnic match	0.050		0.021		−0.009	
	(0.042)		(0.015)		(0.008)	
# of presidential ethnic match years		0.017		0.006		−0.002
		(0.011)		(0.004)		(0.002)
Presidential ethnic match* Moi era	0.121**		0.022*		0.037***	
	(0.050)		(0.012)		(0.009)	
Ethnic match years* Moi era		0.029*		0.005		0.009***
		(0.014)		(0.004)		(0.003)
Observations	46,042	46,042	46,275	47,275	47,275	47,275
R-squared	0.093	0.093	0.085	0.085	0.072	0.072

Appendix F: Democracy robustness tests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Primary years (multiparty years, 1998 transition)		Secondary years (multiparty years, 1998 transition)		Primary years (average POLITY score)		Secondary years (average POLITY score)	
Democracy	0.748***	0.434***	−0.079**	0.067***	0.488***	0.586***	−0.004	0.031
	(0.049)	(0.027)	(0.029)	(0.014)	(0.040)	(0.039)	(0.010)	(0.022)
Presidential ethnic match	0.309***	0.372***	0.132***	0.066	0.447***	0.368***	0.151**	0.103**
	(0.065)	(0.024)	(0.032)	(0.045)	(0.097)	(0.024)	(0.055)	(0.043)
Presidential match* democracy	0.055		−0.013		0.017		0.005	
	(0.040)		(0.016)		(0.018)		(0.008)	
Education minister ethnic match years		0.061***		0.020		0.031		0.036**
		(0.021)		(0.015)		(0.021)		(0.015)
Ed minister ethnic match* democracy		−0.005		−0.001		−0.005		0.004
		(0.007)		(0.007)		(0.005)		(0.003)
Observations	46,818	48,714	45,591	50,255	47,275	48,666	44,993	47,810
R-squared	0.272	0.299	0.091	0.099	0.270	0.287	0.090	0.094

Multiparty years are defined in columns 1–4 as years of schooling prior to 1969 or after 2008 and in columns 5–8 as the average POLITY score in the country during the child's primary or secondary school-age years. Robust standard errors clustered by ethnic group–president in parentheses. Each model includes ethnic group fixed effects and controls for gender, religion, and childhood in a rural area. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.