

Ethnicity Meets Politics: One Hundred Years of Road Building in Kenya

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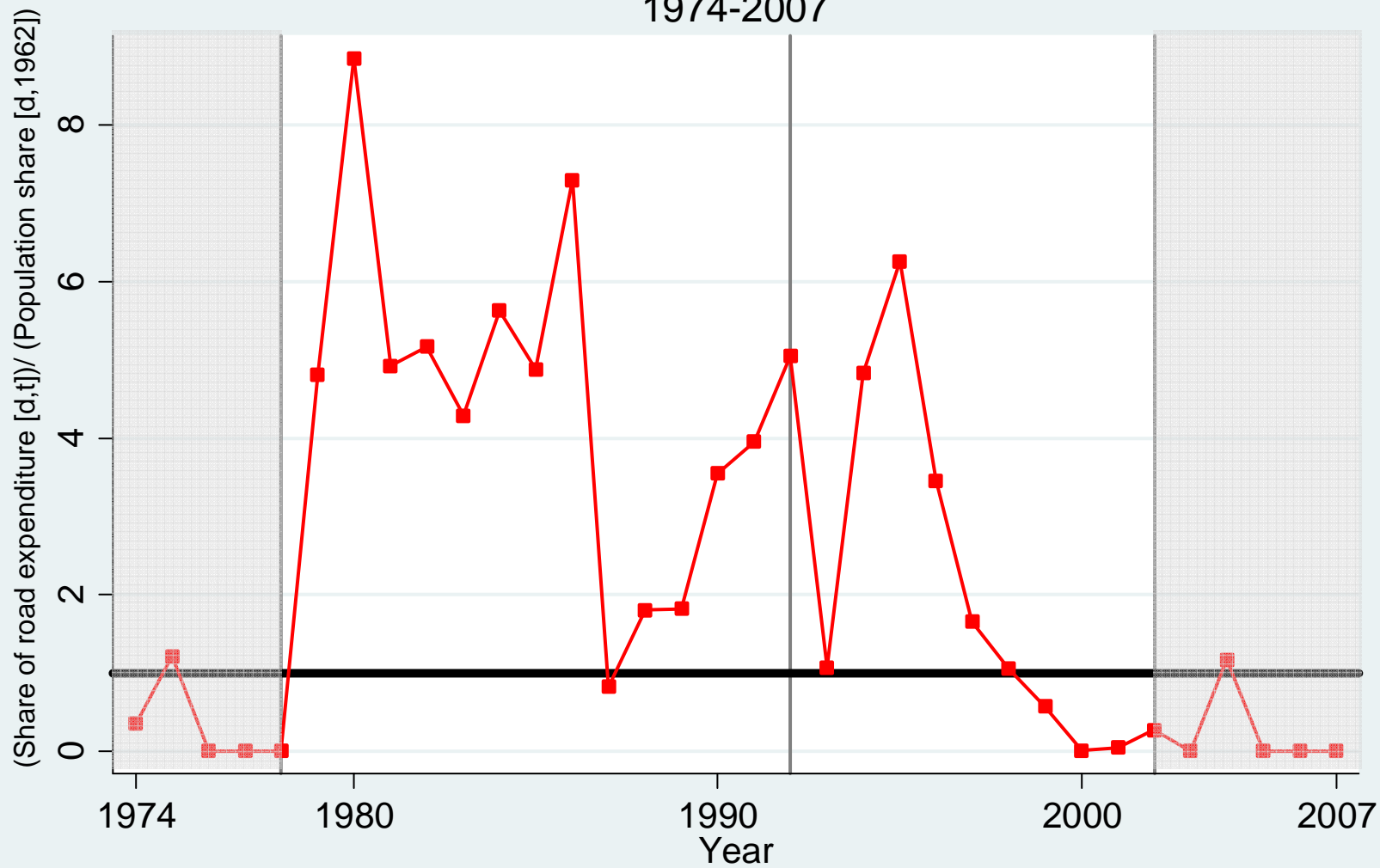
02 June 2010

ETHNICITY MEETS POLITICS

- ▶ take country highly segregated on tribal lines
- ▶ use road expenditure and road length as markers of (highly visible) public investment
- ▶ follows these markers (at the district level) across a hundred years from colonialism through independence to multiparty democracy
- ▶ see whether districts which share ethnicity with (post-independence) political leaders receive greater investments in roads
- ▶ panel data – 41 districts tracked over 118 years

Baringo district - Moi

1974-2007

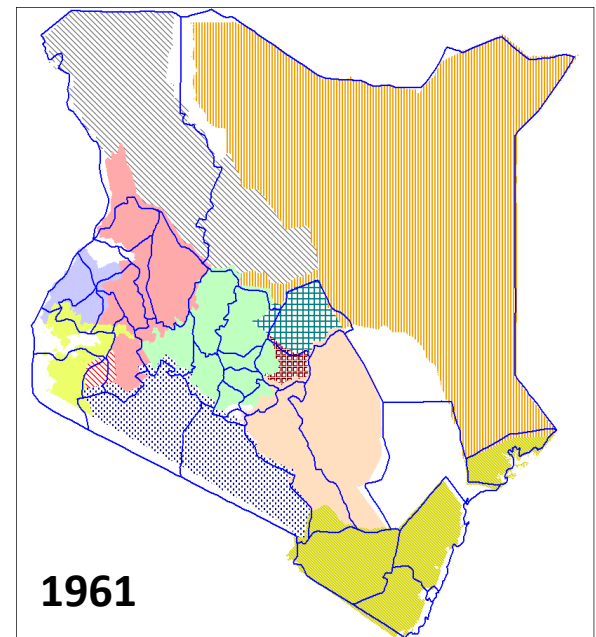
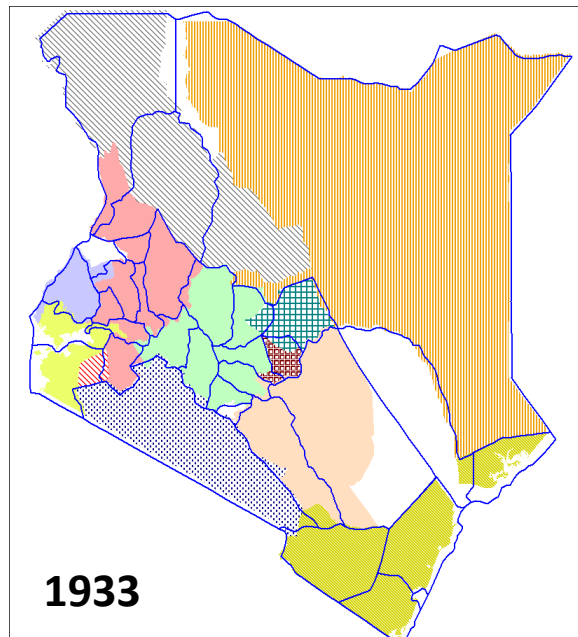
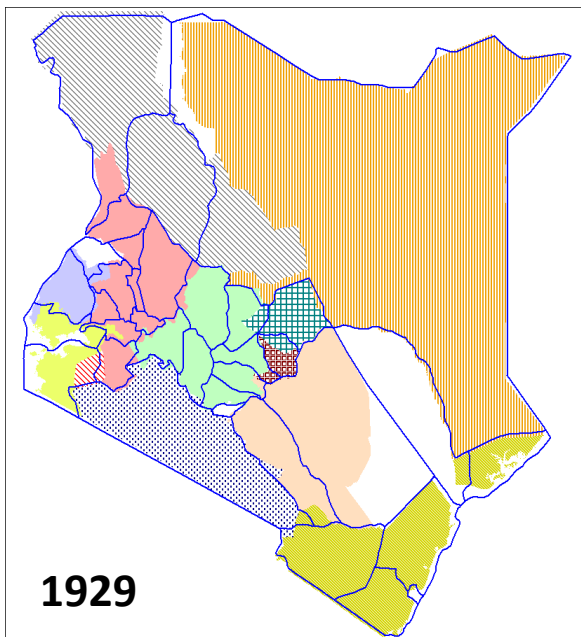
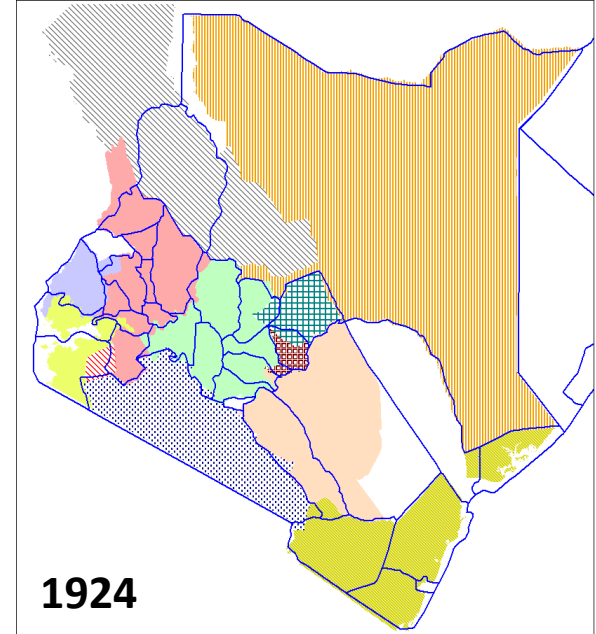
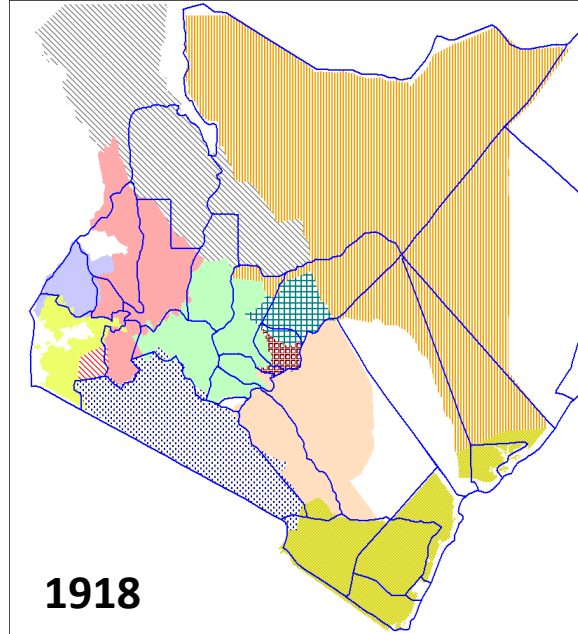
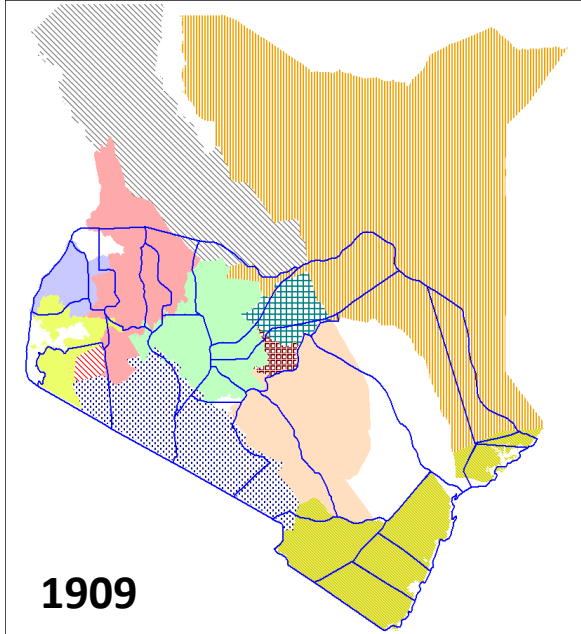


WHY IS THIS IMPORTANT

- ▶ data poverty in Africa has made it difficult to look at ethnic favoritism in public investment
- ▶ and yet such favoritism is often seen as root of underdevelopment in Africa
- ▶ we need to get some fix on whether such favoritism occurs (and on which scale)
- ▶ to do this we need three types of data
 - ▶ ethnicity
 - ▶ politics
 - ▶ roads

ETHNICITY

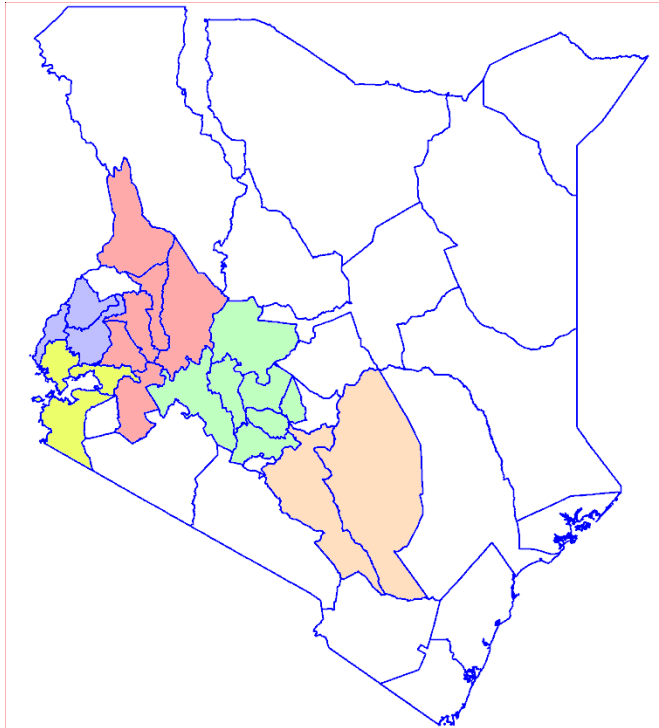
- ▶ ethnicity is the key marker of identity in most African societies (Mamdani 1996)
- ▶ in Kenya it is the tribe, in Zambia it is the language and in Somalia it is the clan (Posner 2005)
- ▶ setting of internal boundaries within Kenya was guided by desire of different tribal groups to remain separate ⇒ Boundary Commission Reports
- ▶ by 1961 (eve of Independence) district boundaries in Kenya largely reflect tribal boundaries ⇒ key to our analysis



- ▶ five main tribes – Kikuyu, Kalenjin, Luo, Luhya, Kamba constitute around 70% of the population
- ▶ live in geographically distinct areas arrayed over belt of land on route between Mobassa and Kampala (which contains best agricultural land)
- ▶ limited intermarriage, tribe is not fluid concept in Kenya
- ▶ highly segregated – only 4 out of the 41 districts do not have a tribal group that comprises $>50\%$ of the population
- ▶ shares in the overall Kenyan population have remained roughly constant over time (as did locations)

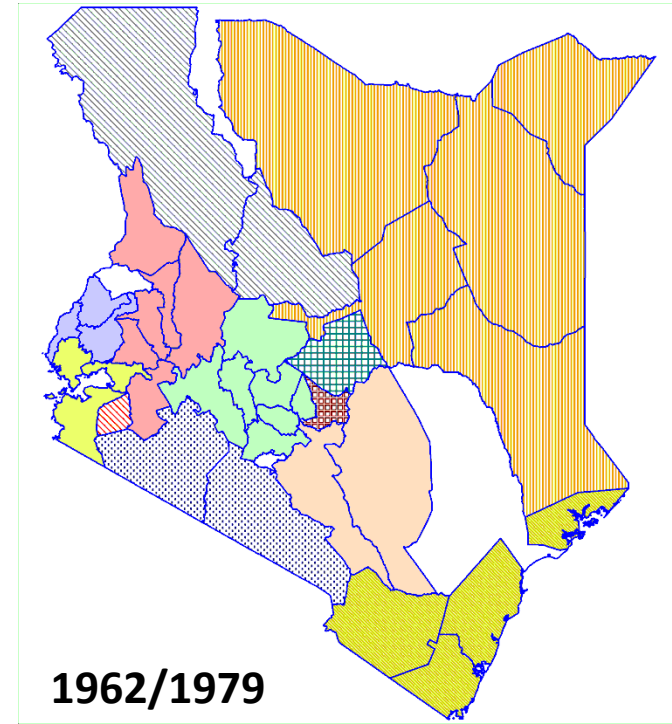
1962 District Boundaries (41) and Ethnic Groups

5 main ethnic groups



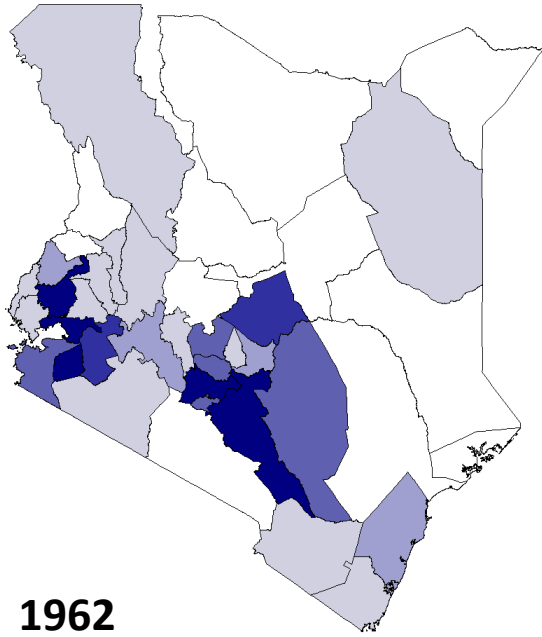
- Kikuyu
- Kalenjin
- Luo
- Kamba
- Luhya
- Meru
- Kisii
- Embu
- Coastal
- Maasai
- Somali
- Turkana-Samburu
- District Boundaries

12 ethnic groups

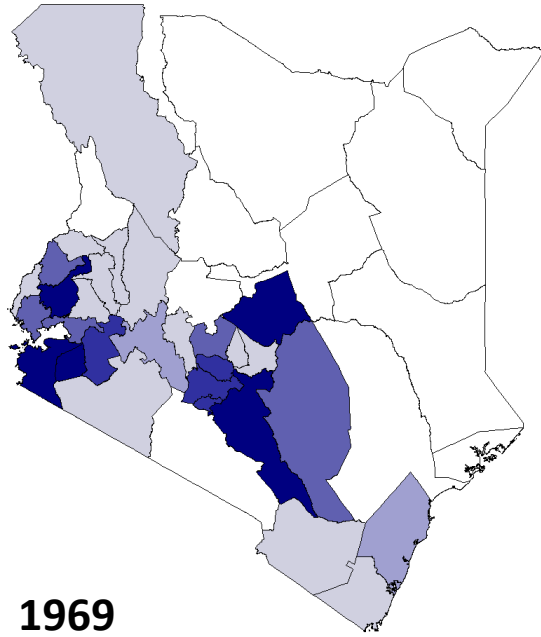


A district is defined as being of ethnicity “e” if more than 50% of its population comes from ethnic group “e”. Those districts with no ethnic group being more than 50% of their population are in white.

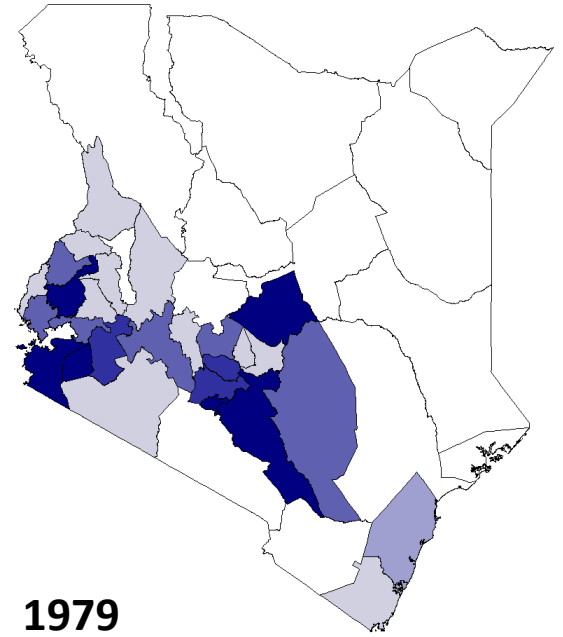
District Population Share (%) of Total Population, 1962-1999



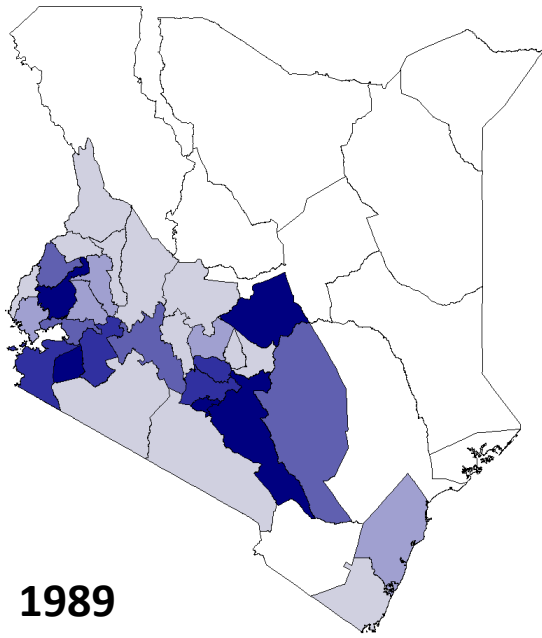
1962



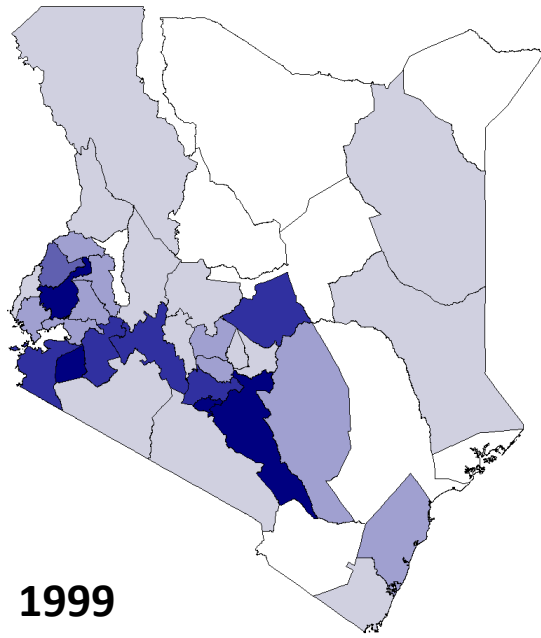
1969



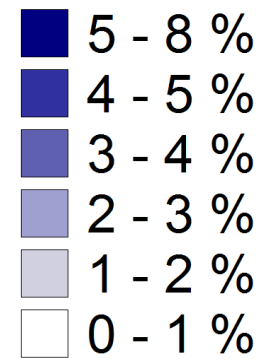
1979



1989



1999



ETHNIC CENSUS 1962-1989

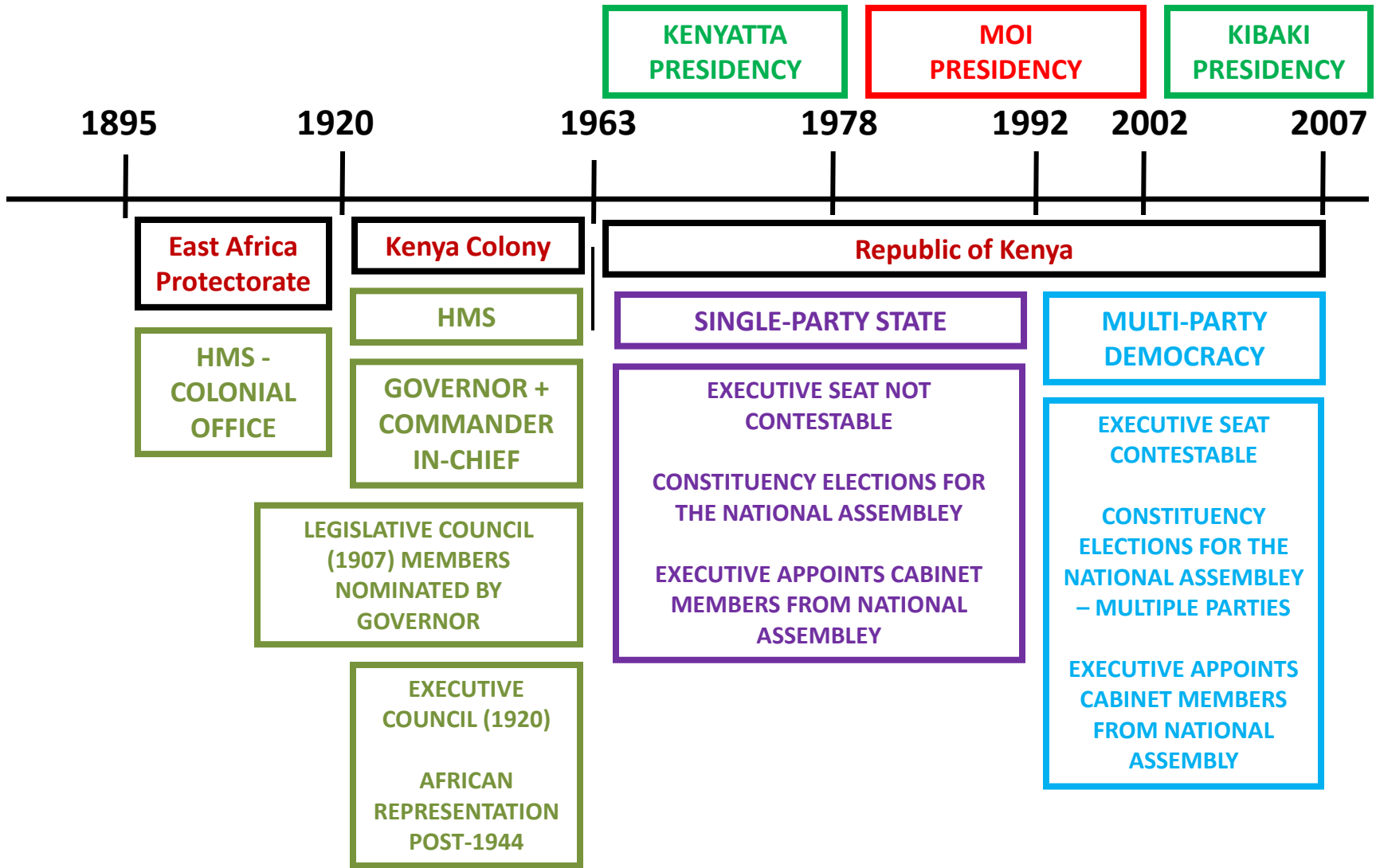
Census year	Kikuyu	Embu	Meru	Luo	Luhya	Kamba	Kalenjin	Kisii	Coastal	Turkana-Samburu	Somali	Masai	Total Population
1962	19.10%	1.50%	5.50%	13.30%	12.60%	10.80%	10.50%	6.70%	6.60%	4.00%	4.10%	1.80%	8,636,263
1969	20.10%	1.60%	5.60%	13.90%	13.30%	10.90%	10.90%	6.90%	6.50%	3.70%	2.80%	1.40%	10,956,501
1979	20.90%	1.58%	5.55%	12.76%	13.83%	11.26%	10.78%	6.74%	6.39%	2.94%	3.37%	1.57%	15,327,061
1989	20.78%	1.67%	5.53%	12.38%	14.38%	11.42%	11.46%	6.67%	6.86%	2.72%	2.92%	1.76%	21,448,774

Notes: The Embu are the Embu and Mbeere tribes; the Meru are the Meru and Tharaka tribes; the Luo are the Luo and Basuba tribes; the Kisii are the Kisii and the Kuria tribes; the Coastal are the Mijikenda, Pokomo/Riverine, Taveta, Taita, Swahili/Shirazi, Bajun and the Boni/Sanye tribes. Prior to the 1979 population census the Kalenjin category did not exist. The 1979 Population Census introduced the Kalenjin tribe which consisted of the Nandi, Kipsigis, Elgeyo, Marakwet, Pokot, Sabaot and Tugen tribes. The Turkana-Samburu tribes are the Samburu, Turkana, Teso, Nderobo, Njemps, Rendille and the El Molo tribes. The Somali are the Boran, Gabbra, Sakuye, Orma, Gosha, Ogaden, Ajuran, Gurreh and Other Somalis. Source: Kenya Population Census.

POLITICS

- ▶ British protectorate (1895-1920) and then colony (1920-1963)
- ▶ British Governor appoints Executive and Legislative Council
- ▶ after Independence Presidential system of government adopted – president appoints cabinet
- ▶ Kikuyu (Kenyatta 1963-1978) ⇒ Kalenjin (Moi 1978-2002) ⇒ Kikuyu (Kibaki 2002 - ?) pattern of presidents
- ▶ Kenya operates single party system and multi-party democracy does not come in until 1992
- ▶ we build up data base on ethnicities of each of the 13 cabinets between 1963 and 2007
- ▶ allows us to track tribal composition of cabinets across the post-Independence period

Political History Kenya



ROADS

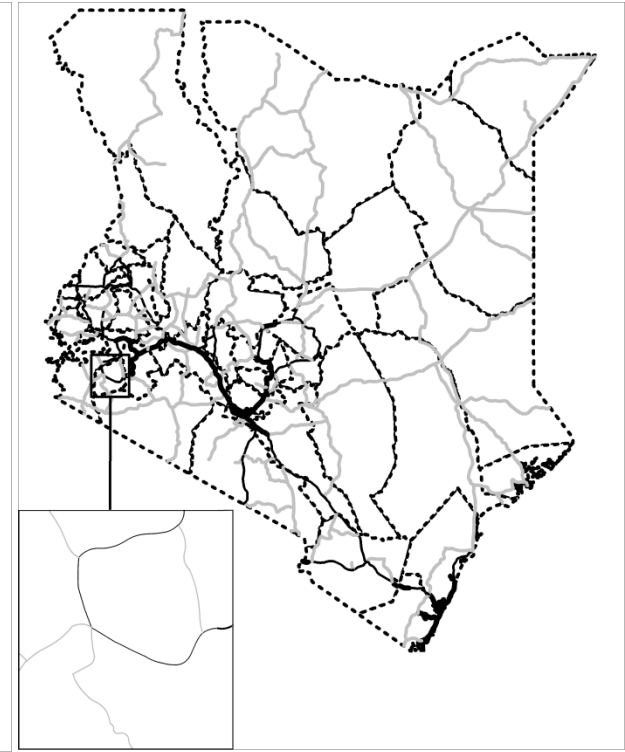
- ▶ first road 1890, first paved road 1945
- ▶ initially followed Mombassa-Kampala railway and extensions tended to built into areas demarcated for agricultural development by settlers
- ▶ two sources of data (for both pre and post-independence)
 - ▶ road expenditure – 1901 to 1962 from colonial reports and from 1974-2007 Kenya Development Estimates
 - ▶ road length – GIS road map layers built up from colonial reports, Michelin road maps and Survey of Kenya road map



A. Michelin map in 1961

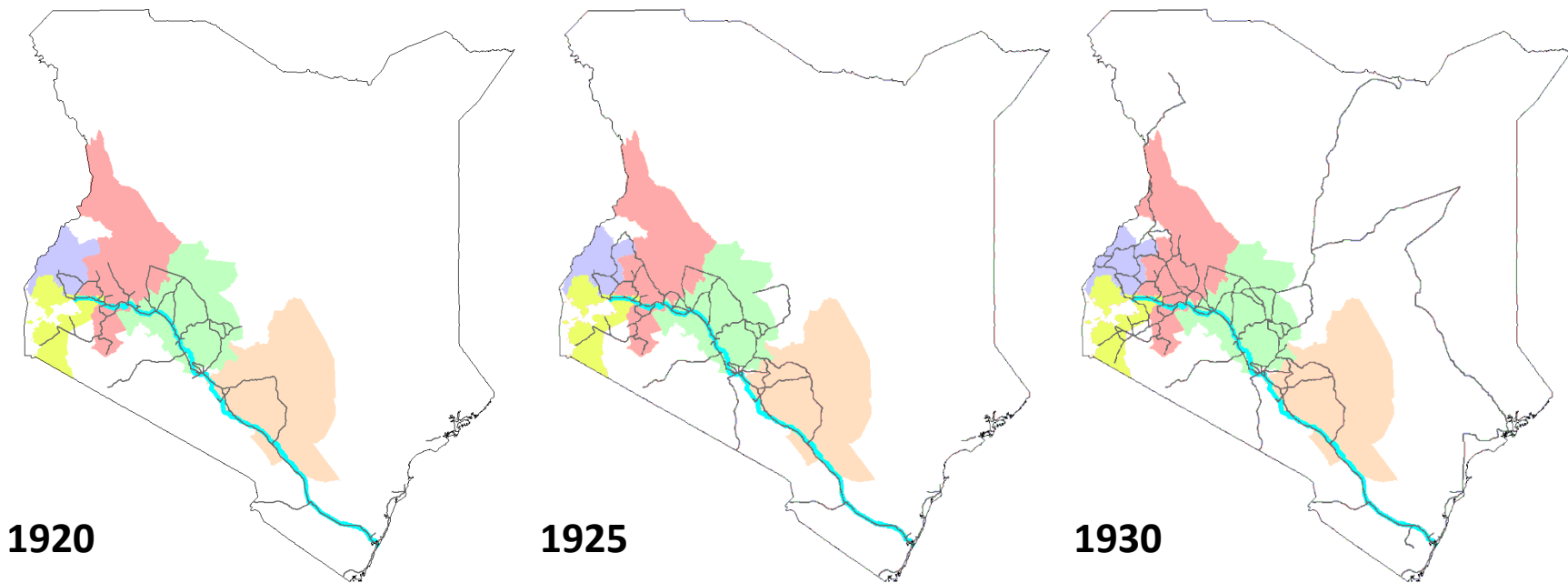
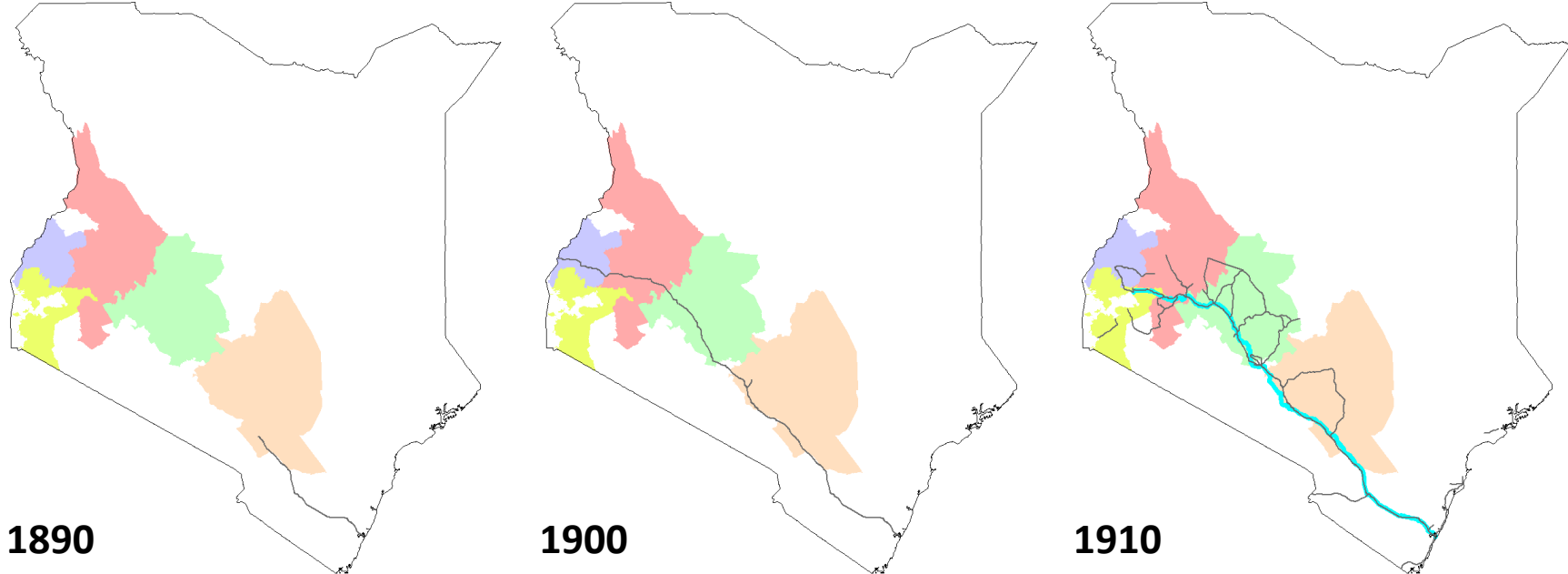


B. GIS Database creation -
Digitization and
Standardization



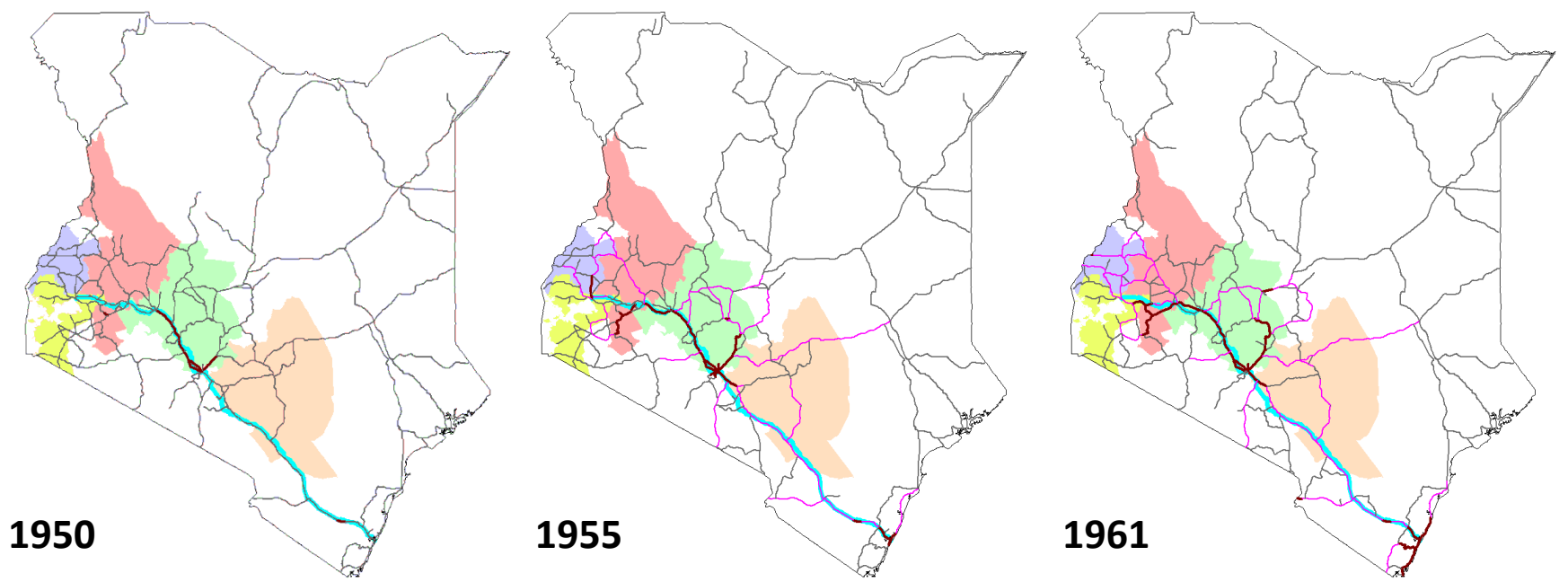
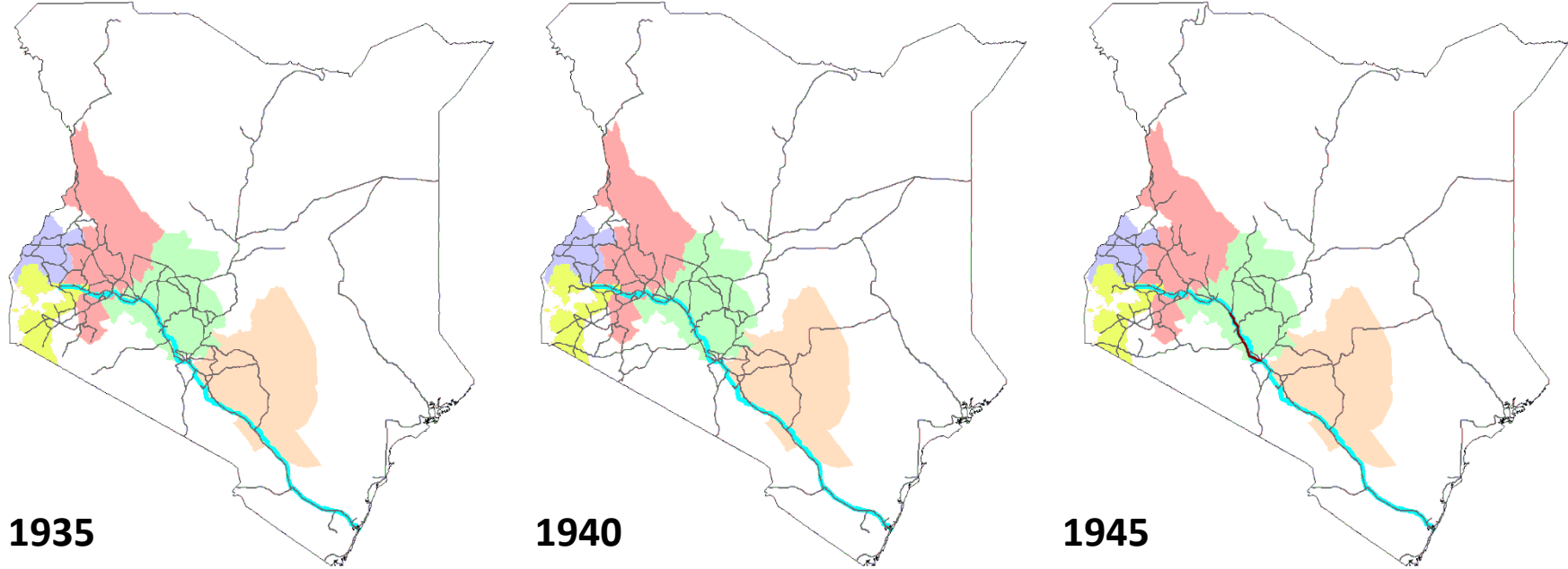
C. Overlay of district
boundaries on Road GIS
database

- ▶ big question – where did these roads go? and is this related to whether district shares ethnicity with political leaders
- ▶ road maps 1890-2002 suggestive
 - ▶ roads under british built to promote trade and agricultural export
 - ▶ if we compare 1964 and 1979 see more paved and improved roads appearing in Kikuyu districts relative to Kalenjin (or other districts)
 - ▶ however if we compare 1981 to 2002 we see this trend reverse with the paved/improved road network largely frozen in Kikuyu districts but with this network expanding dramatically in Kalenjin districts



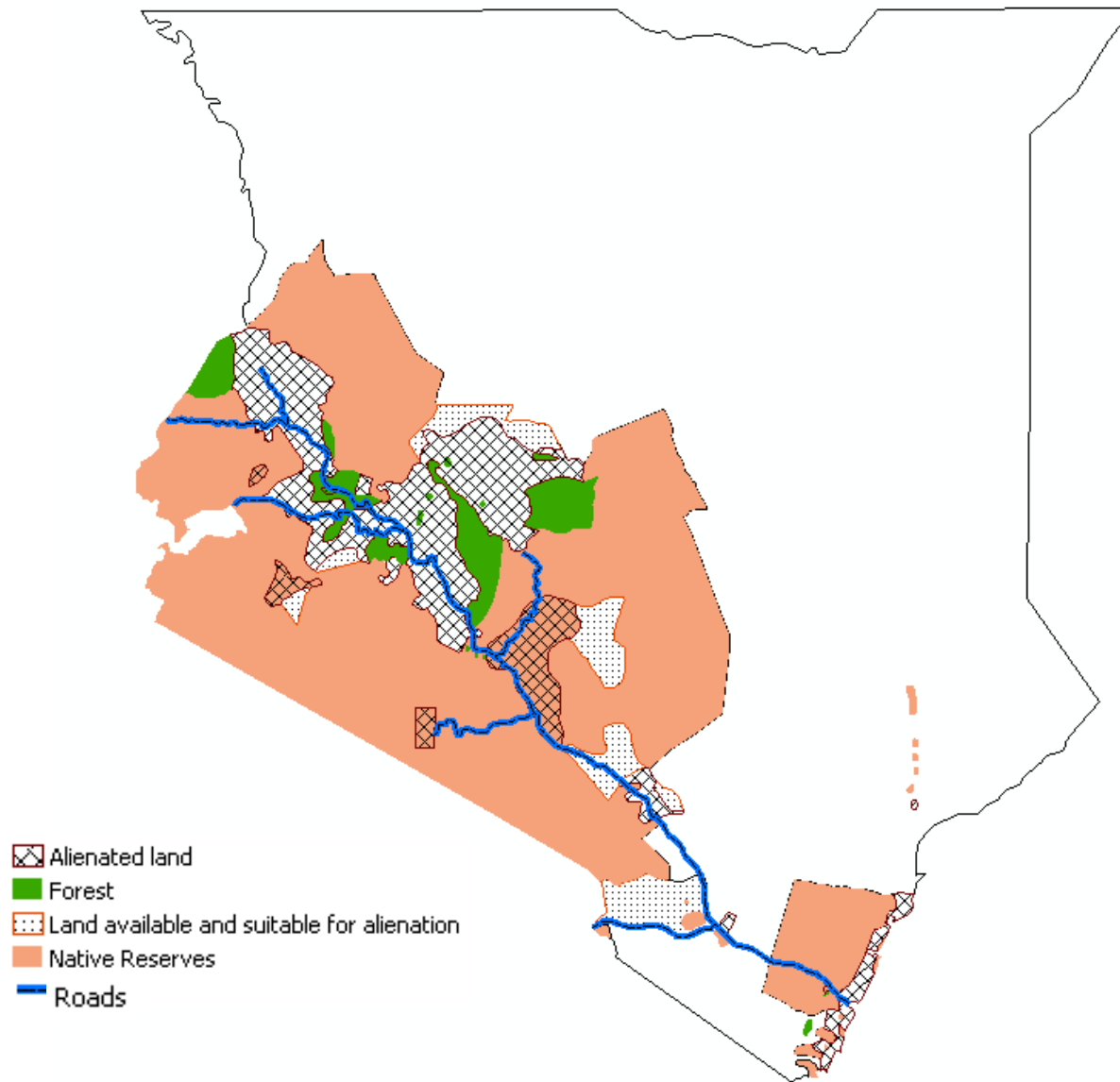
Kikuyu
 Kalenjin
 Luo
 Luhya
 Kamba

Paved Road
 Improved Road
 Tracks
 Railway



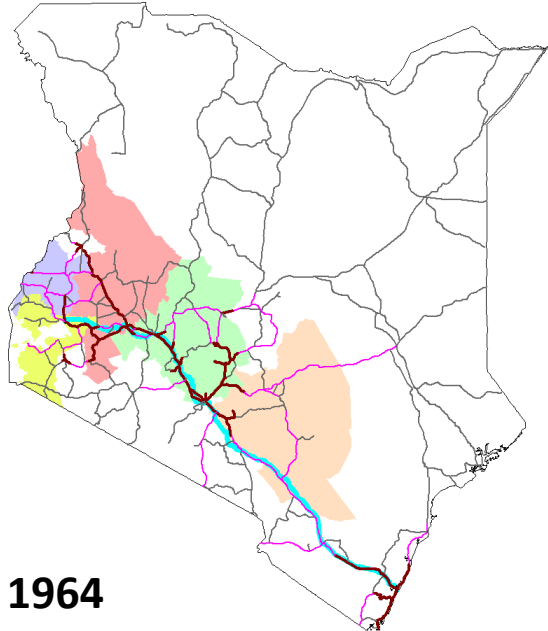
Kikuyu
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Paved Road
 Improved Road
 Tracks
 Railway

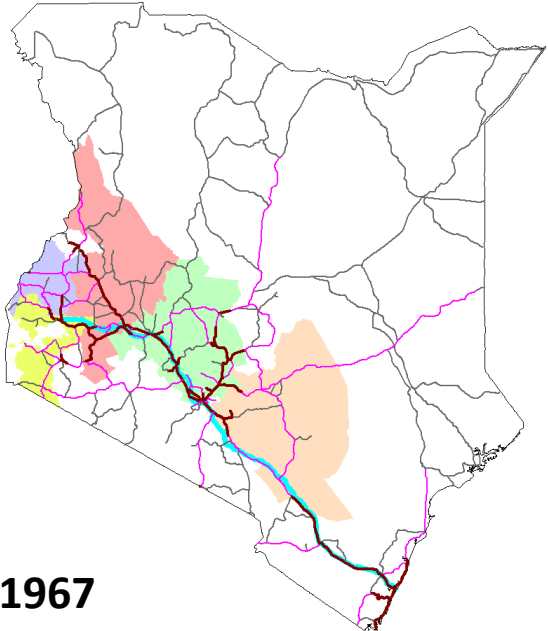


Land and Land Conditions

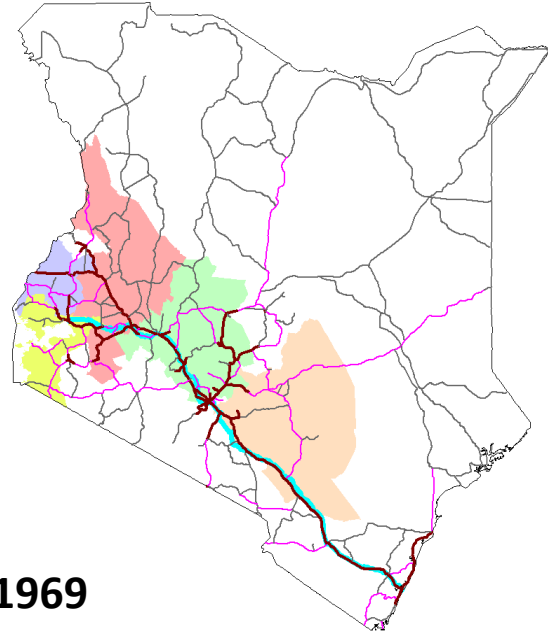
Source: Land Dept. Nairobi, Colony and Protectorate of Kenya (1936)



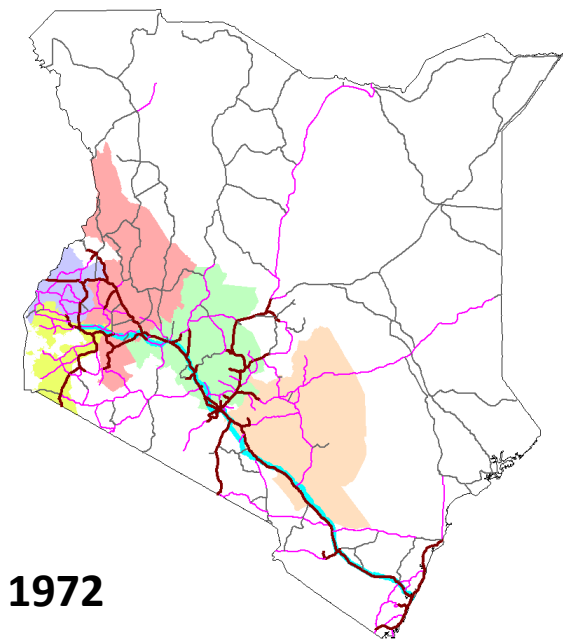
1964



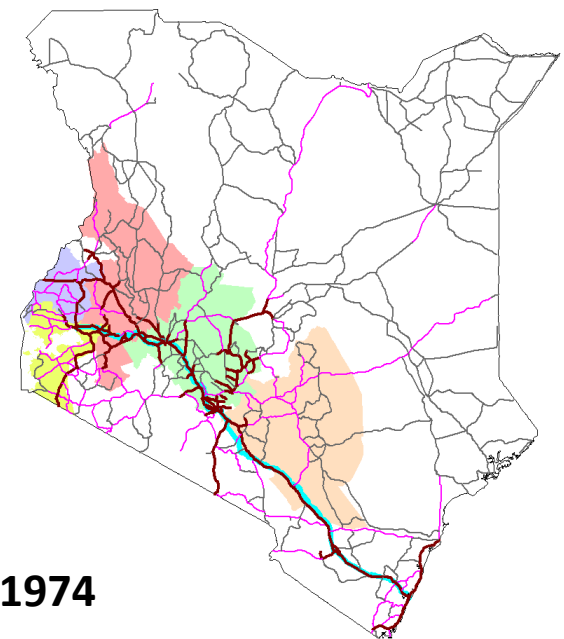
1967



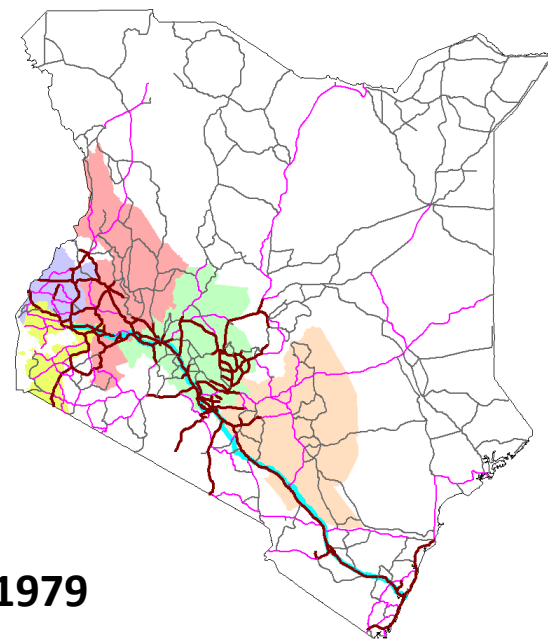
1969



1972



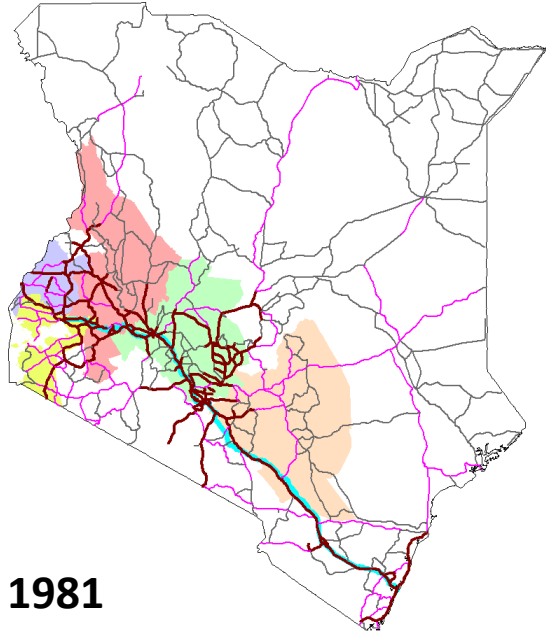
1974



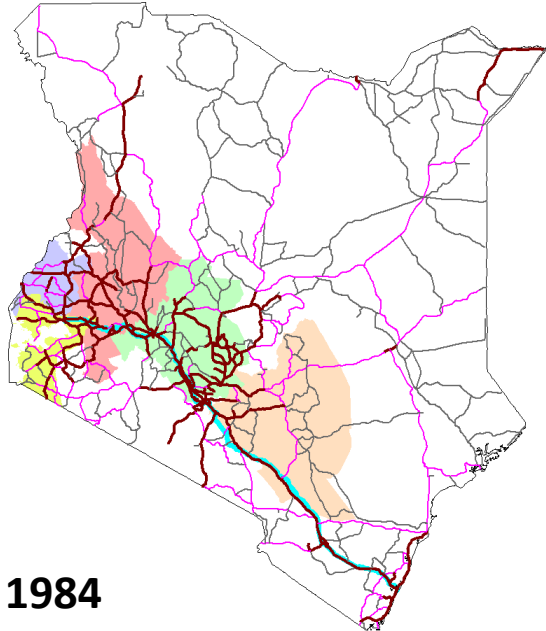
1979

■ Kikuyu ■ Kalenjin ■ Luo ■ Luhya ■ Kamba

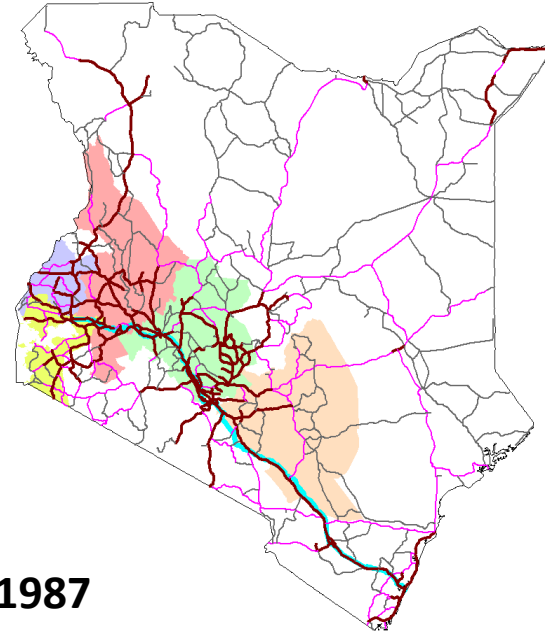
— Paved Road — Improved Road — Tracks — Railway



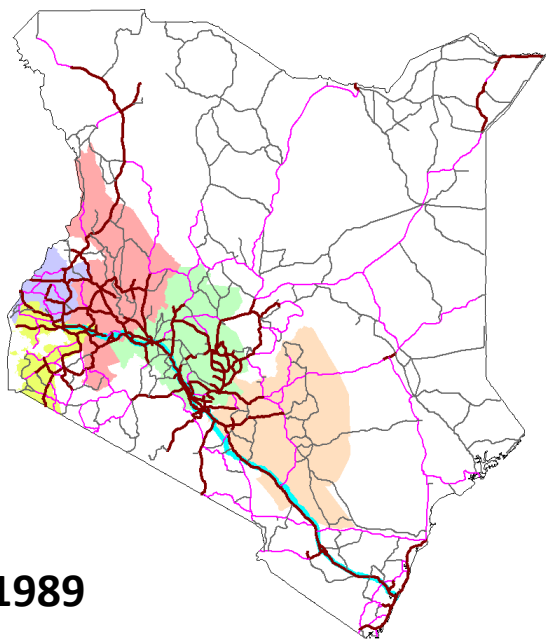
1981



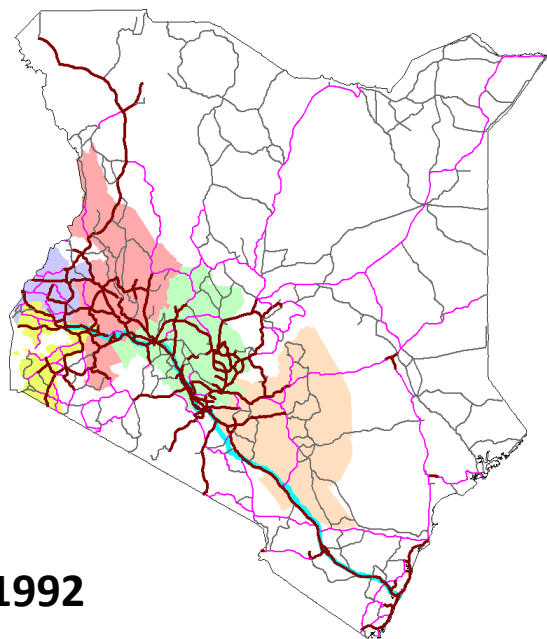
1984



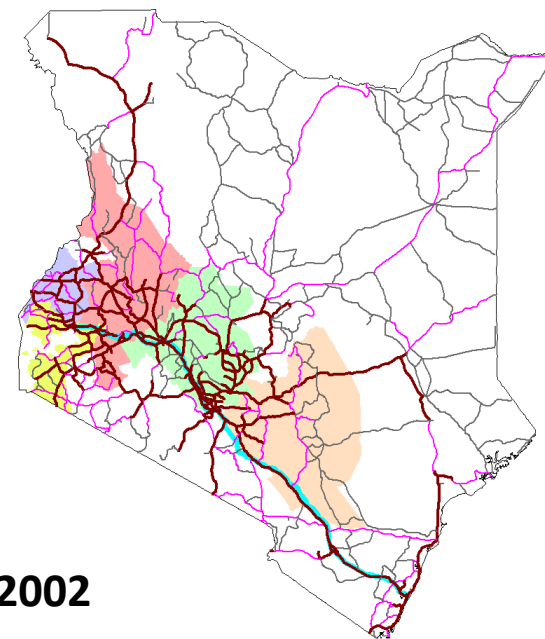
1987



1989







1992



2002

 Kikuyu  Kalenjin  Luo  Luhya  Kamba

 Paved Road  Improved Road  Tracks  Railway

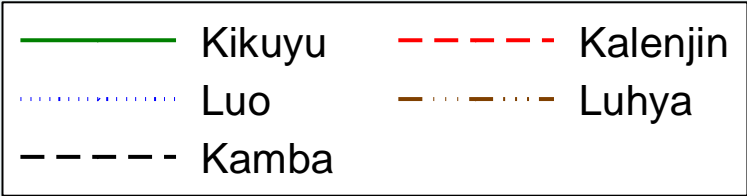
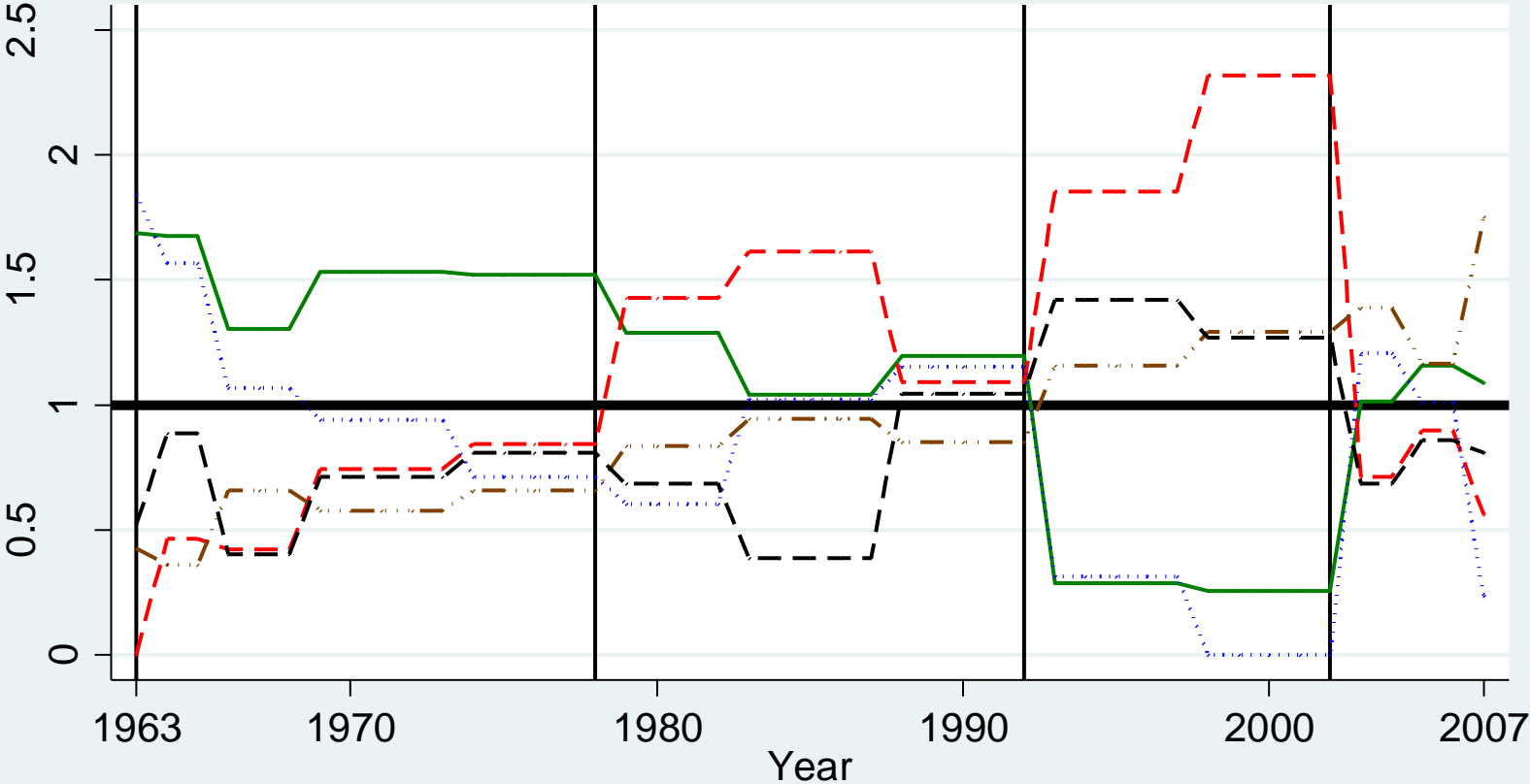
EMPIRICAL STRATEGY

- ▶ start by constructing measure of how well different tribes are presented in the cabinet relative to their share in the Kenyan population

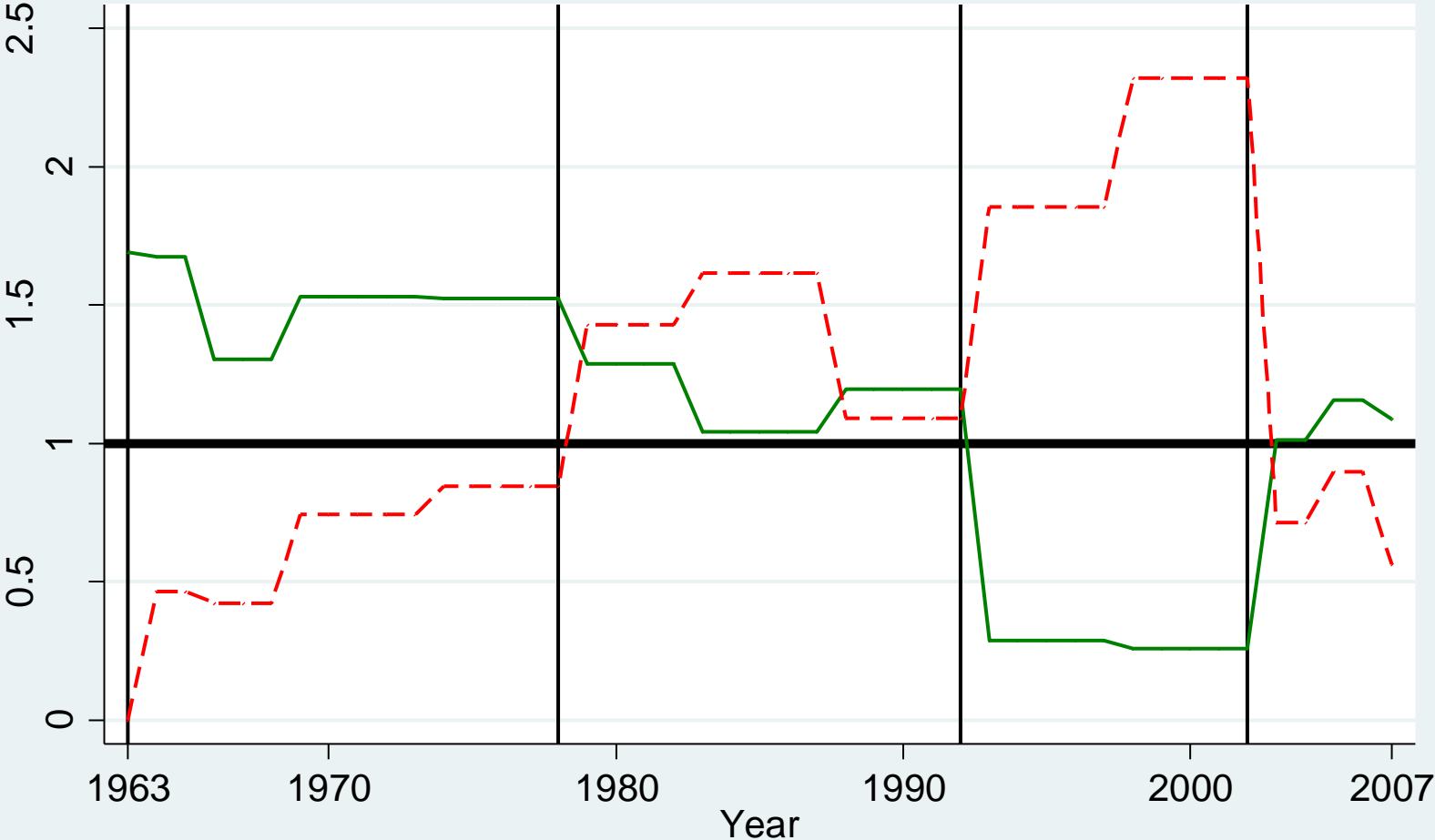
$$\frac{\text{cabinet share}_t^{tr}}{\text{population share}^{tr}}$$

- ▶ a value of 1 denotes political representation in line with population share
- ▶ we track the composition of the 13 cabinets between 1963 and 2007
- ▶ examine graphically how this measure of political representation changes across political transitions
- ▶ what is clear is that presidents stack cabinets with members of their ethnic group
- ▶ but we do not know whether this affects resources flowing to districts

Cabinet Representation 1963-2007



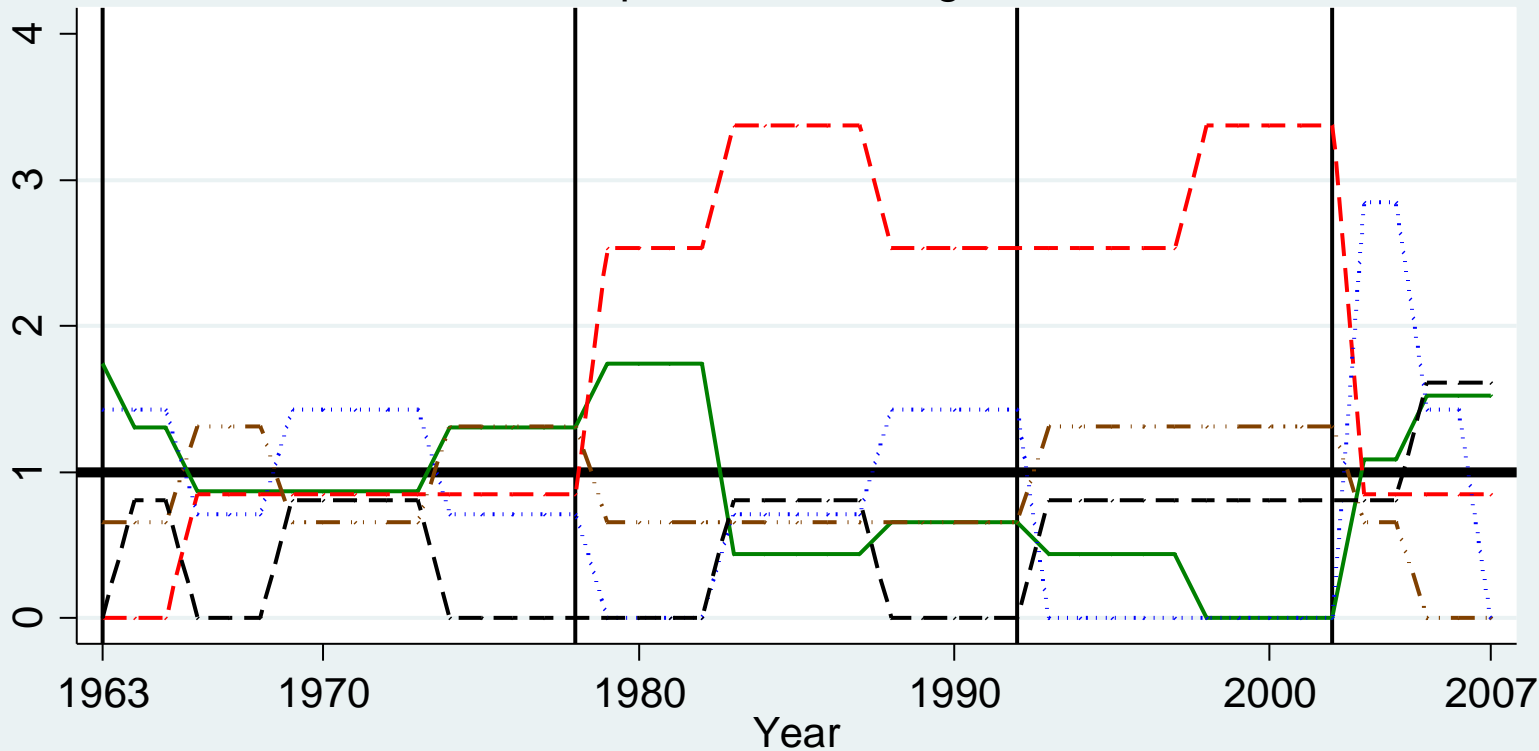
Cabinet Representation 1963-2007



— Kikuyu - - - Kalenjin

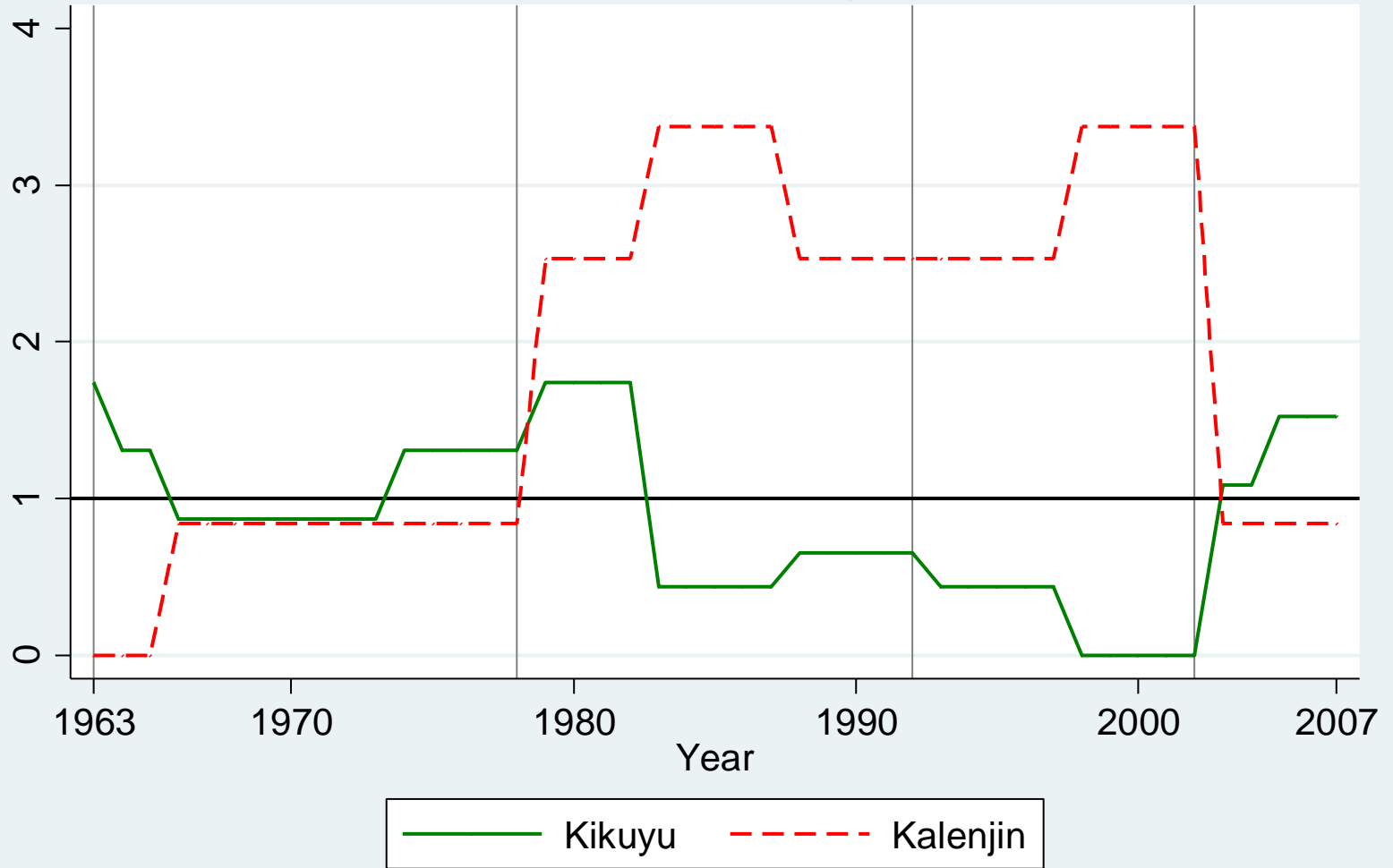
Cabinet Representation

Top 10 Fiscal Budgets



Cabinet Representation 1963-2007

Top 10 Fiscal Budgets

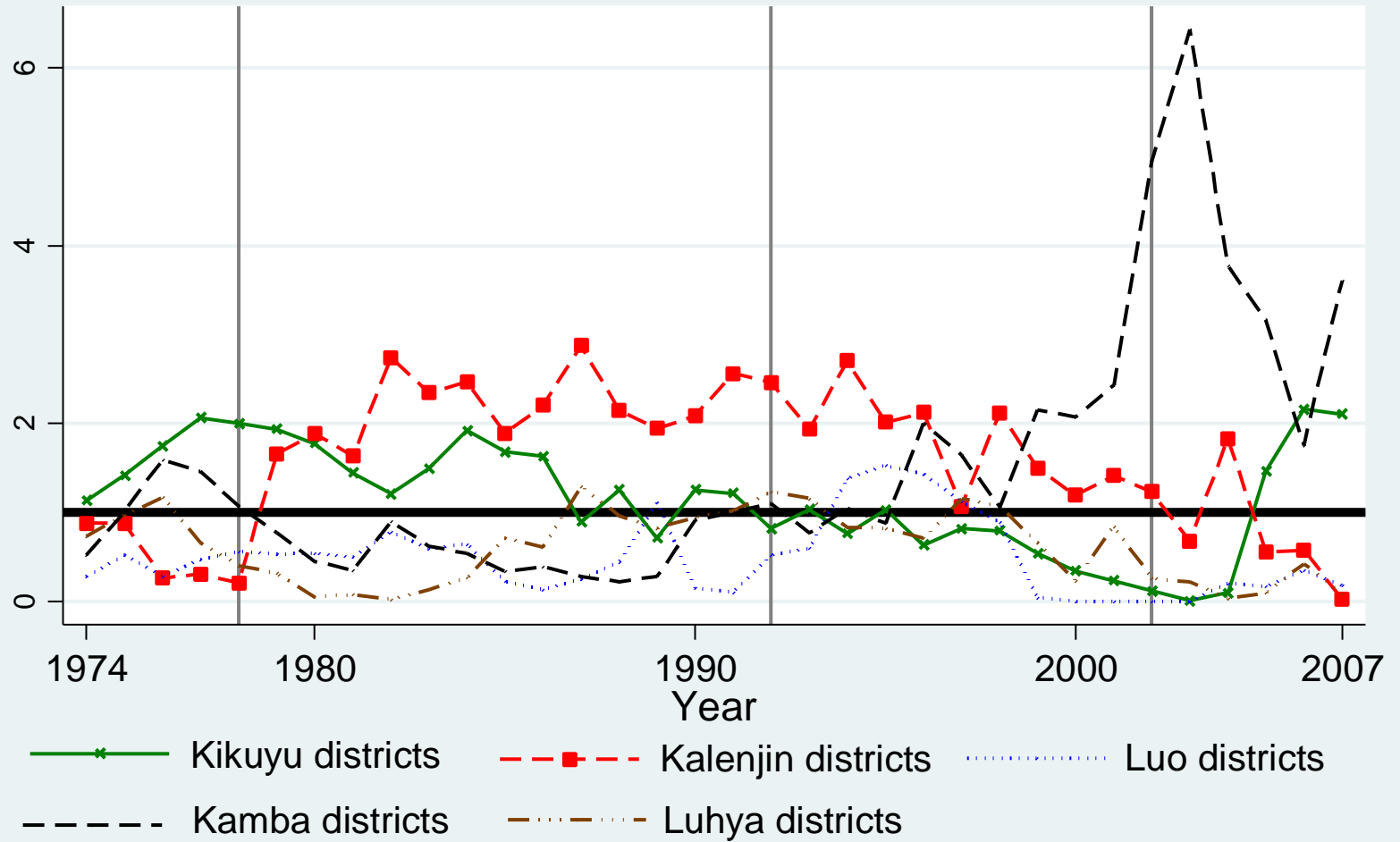


- ▶ we then construct district specific measures of whether the share of spending on roads in a district is in line with the population share of that district
- ▶ we divide up districts into those with Kikuyu, Kalenjin, Luo, Luhya and Kamba majorities and examine

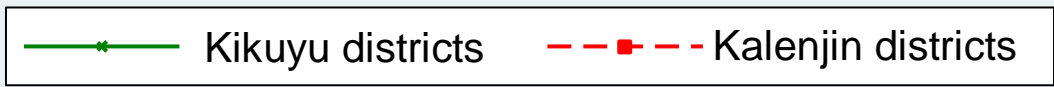
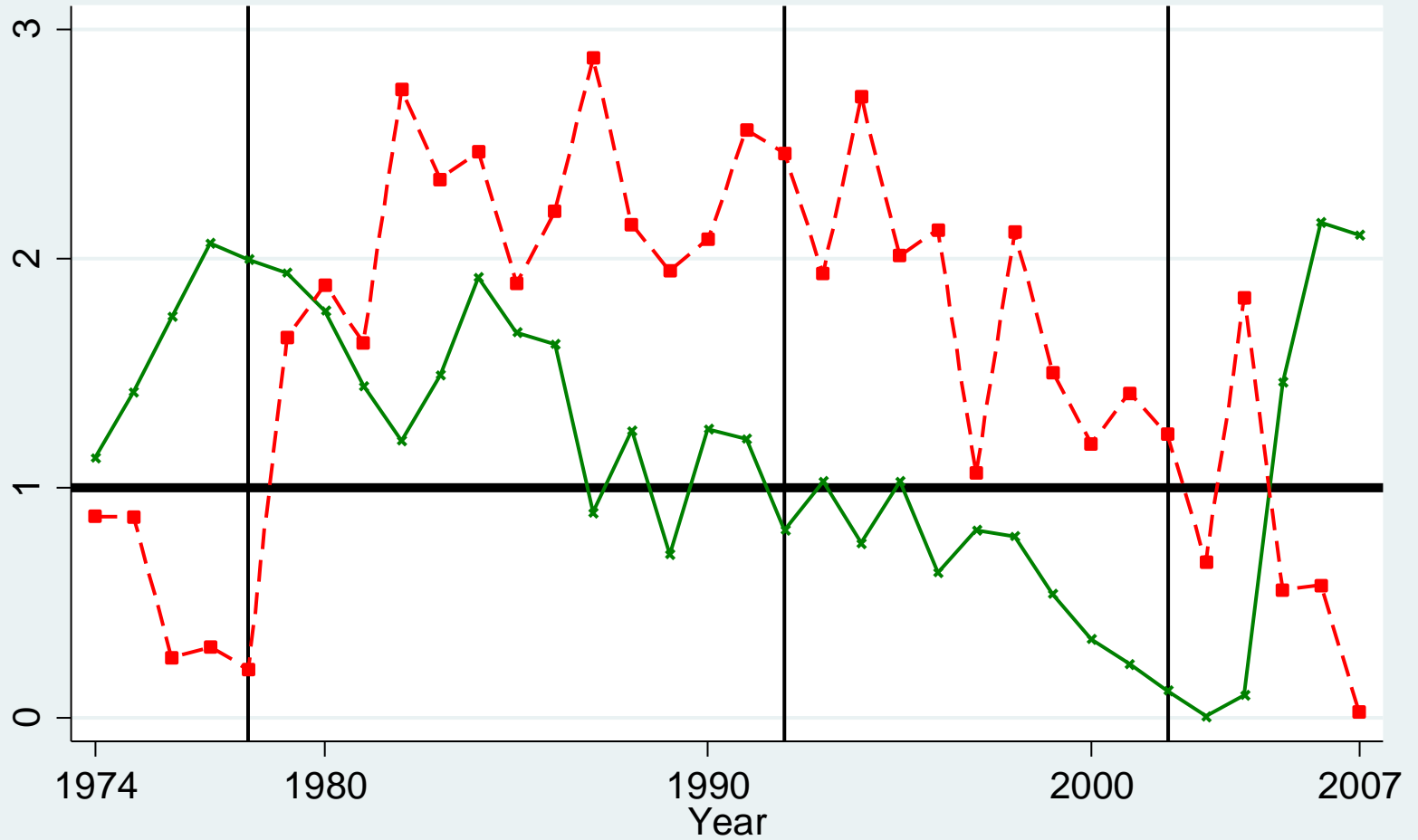
$$\frac{\textit{road spending share}_{dt}}{\textit{population share}}$$

- ▶ a value of above 1 denotes that a district is getting more of the national road budget relative to its population share, vice versa for values below 1
- ▶ we can then examine whether greater political representation leads to districts receiving a higher share of road spending than would be predicted by their population share
- ▶ similar graphical analysis can be done for road length

Road Expenditure 1974-2007

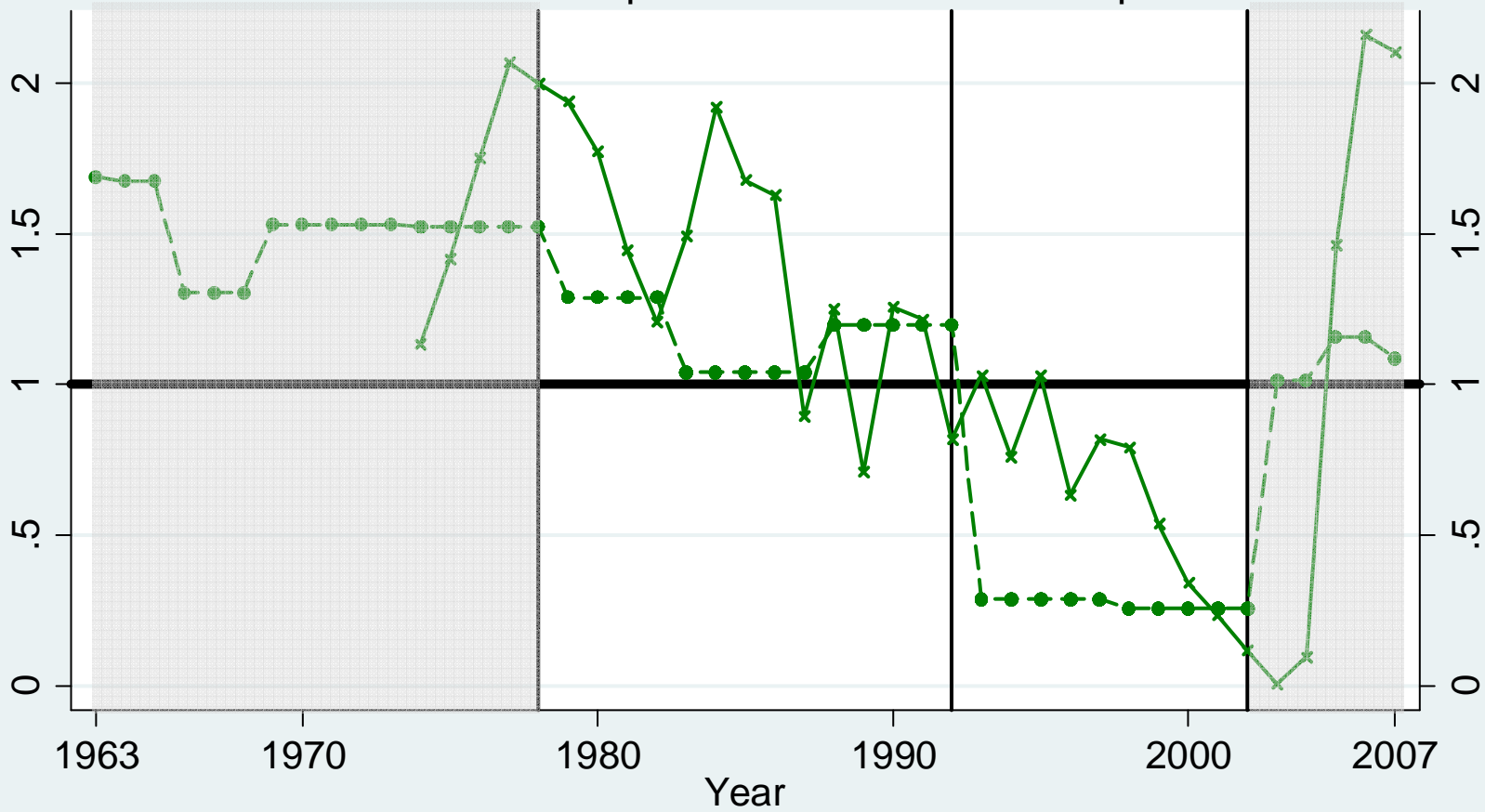


Road Expenditure 1974-2007



Kikuyu Districts

Evolution of Cabinet Representation and Road Expenditure

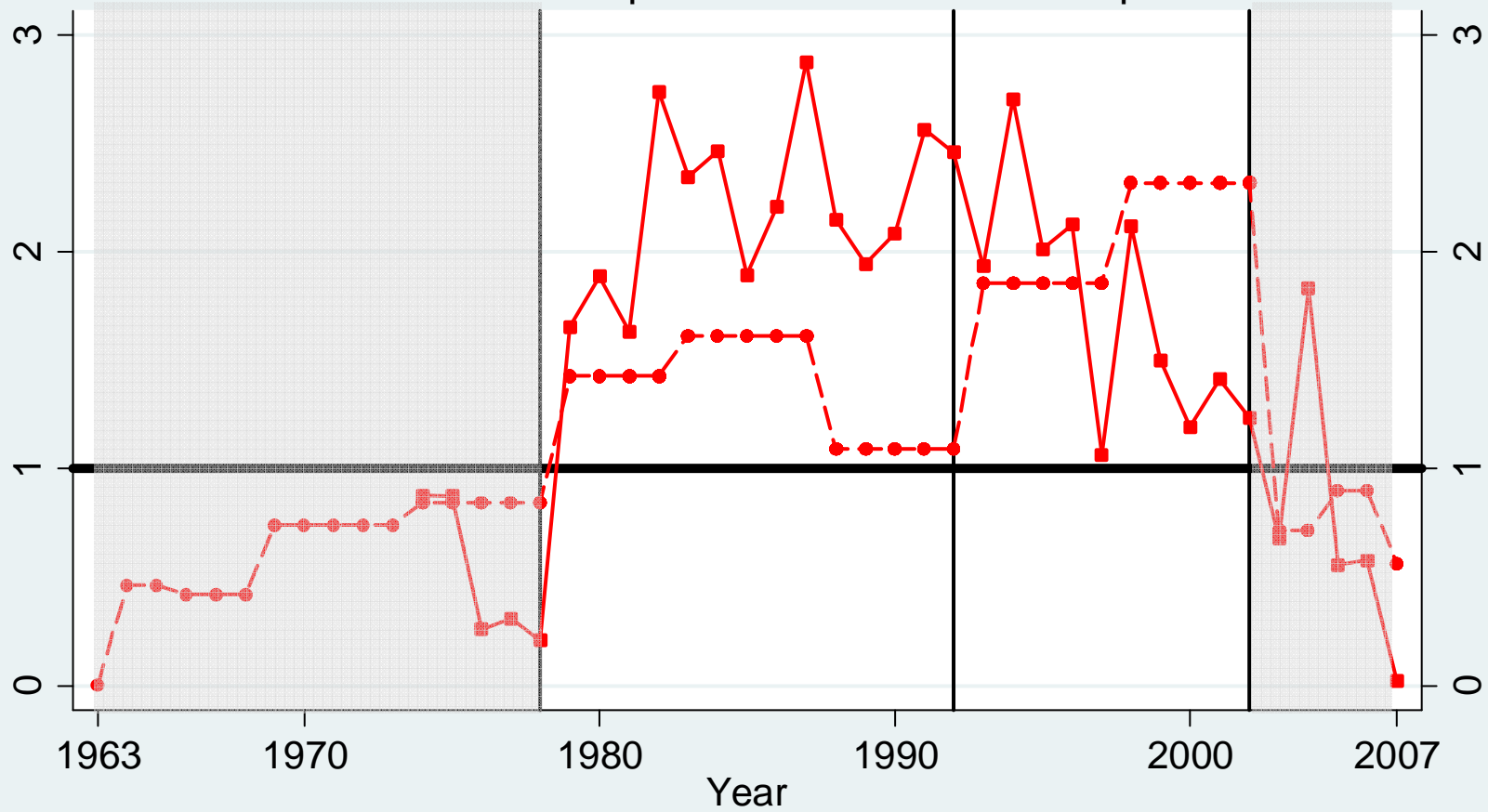


—●— Cabinet Representation

—x— (Share of road expenditure [e,t])/(Population share [e,1962])

Kalenjin Districts

Evolution of Cabinet Representation and Road Expenditure

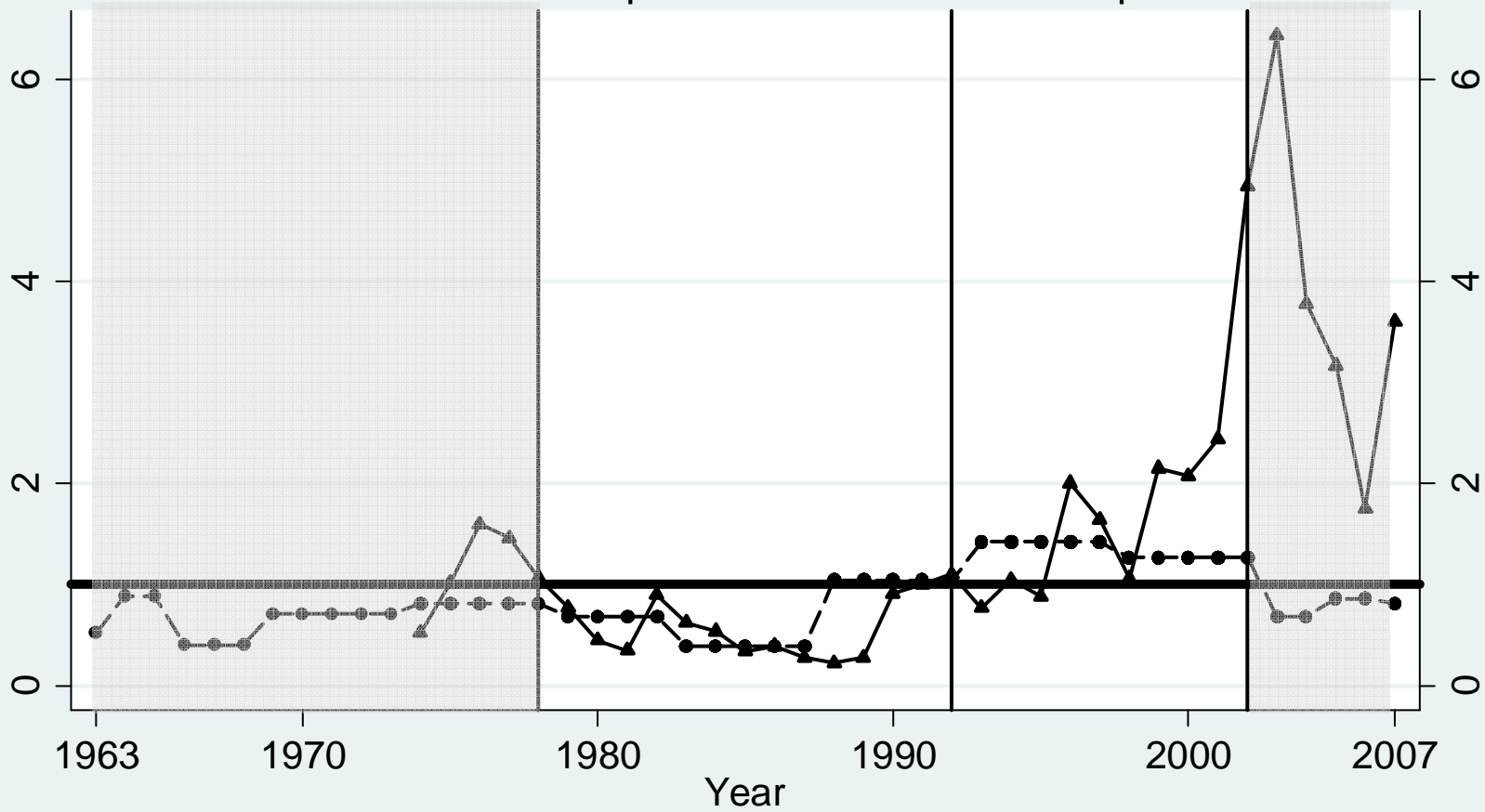


---●--- Cabinet Representation

—■— (Share of road expenditure [e,t]) / (Population share [e,1962])

Kamba districts

Evolution of Cabinet Representation and Road Expenditure

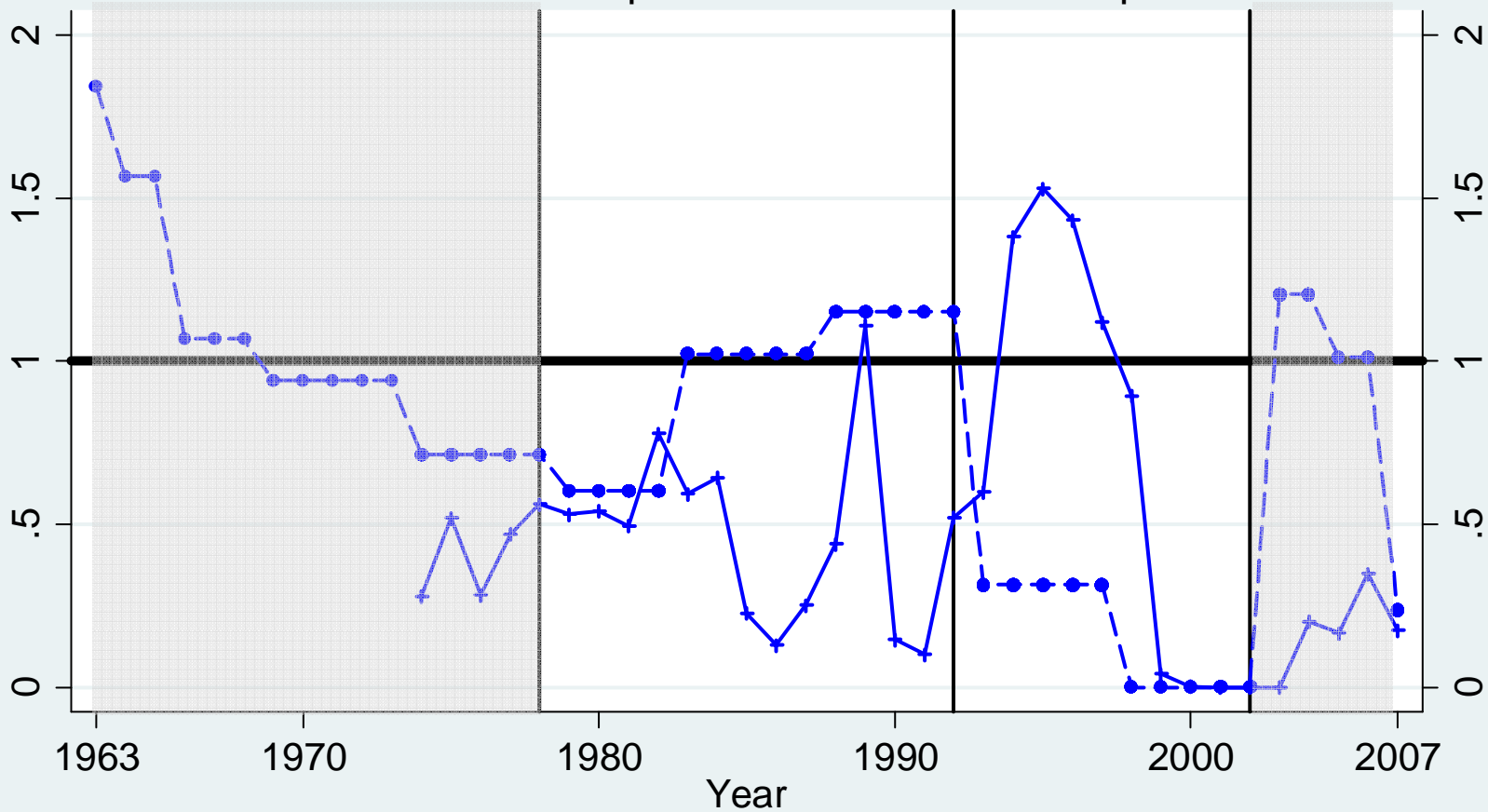


---●--- Cabinet Representation

—▲— (Share of road expenditure [e,t])/(Population share [e,1962])

Luo districts

Evolution of Cabinet Representation and Road Expenditure

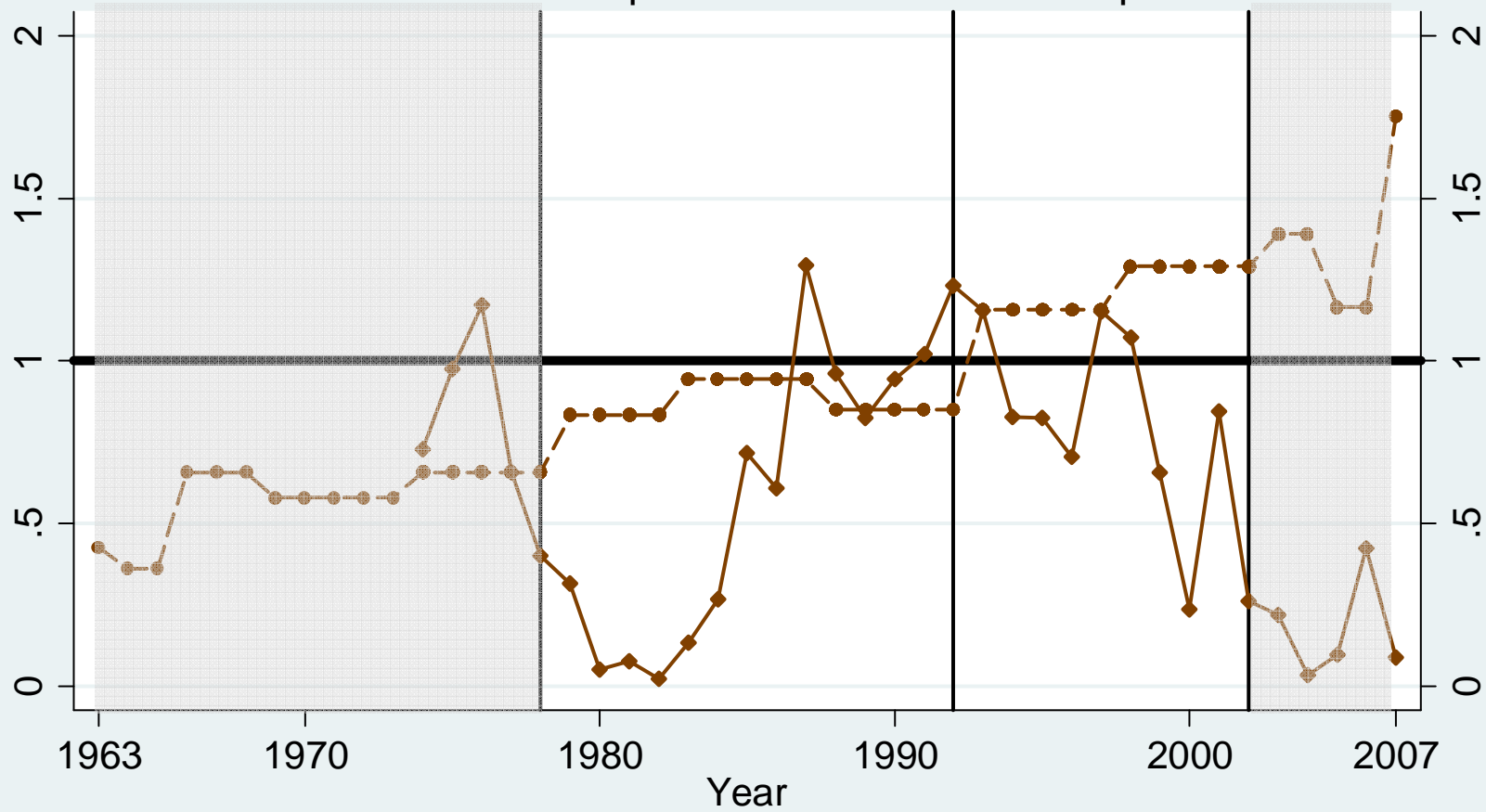


—●— Cabinet Representation

—+— (Share of road expenditure [e,t])/(Population share [e,1962])

Luhya districts

Evolution of Cabinet Representation and Road Expenditure



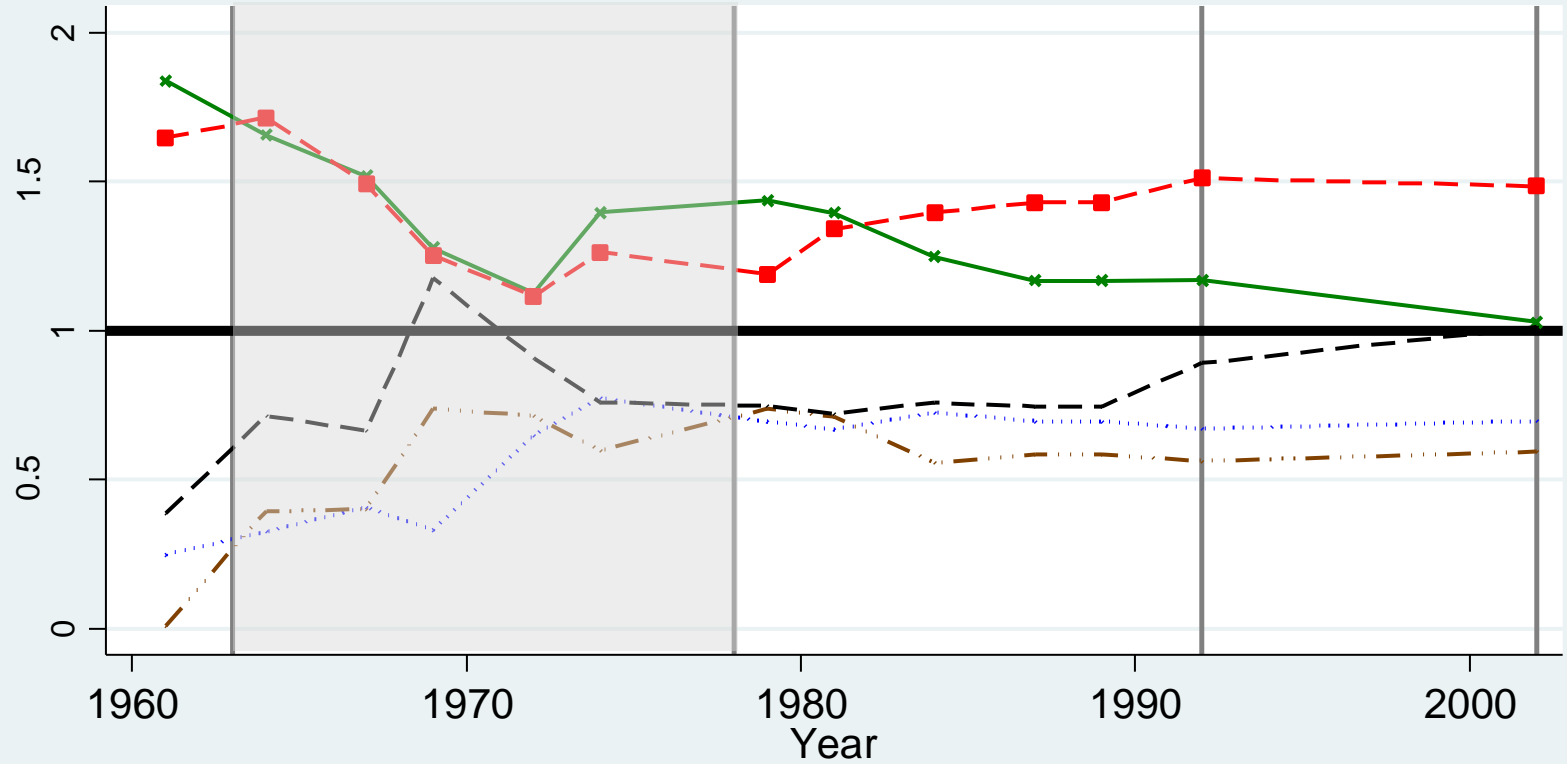
- Cabinet Representation
- ◆— (Share of road expenditure [e,t]/(Population share [e,1962]))

ROAD EXPENDITURE 1901-2007

<i>Dependent variable: Share of road expenditure [d,t]/Population share [d,1962]</i>						
	Colonial	Kenyatta	Moi	Moi-1992	Moi-2002	Kibaki
Kikuyu share [d,1979]	0.812 (0.534)	1.759** (0.741)	-0.343 (0.684)	0.138 (0.841)	-1.018 (0.874)	0.164 (0.981)
Kalenjin share [d,1979]	1.957* (0.971)	-0.240 (0.373)	1.561* (0.915)	2.212** (1.017)	0.649 (1.393)	-0.493 (1.235)
Luo share [d,1979]	-0.052 (0.388)	-0.430 (0.397)	-0.828 (0.657)	-0.818 (0.743)	-0.841 (0.952)	-1.140 (0.942)
Luhya share [d,1979]	0.185 (0.516)	0.649 (0.713)	-0.886 (0.679)	-0.748 (0.819)	-1.079 (0.997)	-1.334 (1.001)
Kamba share [d,1979]	0.029 (0.269)	0.122 (0.394)	-0.348 (0.584)	-0.786 (0.777)	0.266 (0.678)	1.497 (2.032)
R-squared	0.070	0.384	0.170	0.237	0.132	0.132
Observations	2419	205	984	574	410	205
District fixed effects	-	-	-	-	-	-
Year fixed effects	Y	Y	Y	Y	Y	Y
Controls	N	N	N	N	N	N
No. of districts	41	41	41	41	41	41
Sample	1901-1963	1964-1978	1979-2002	1979-1992	1993-2002	2003-2007
F-test [<i>p-value</i>]	1.45 [<i>0.235</i>]	7.68 [<i>0.008</i>]	6.55 [<i>0.014</i>]	6.61 [<i>0.014</i>]	2.03 [<i>0.162</i>]	0.26 [<i>0.616</i>]

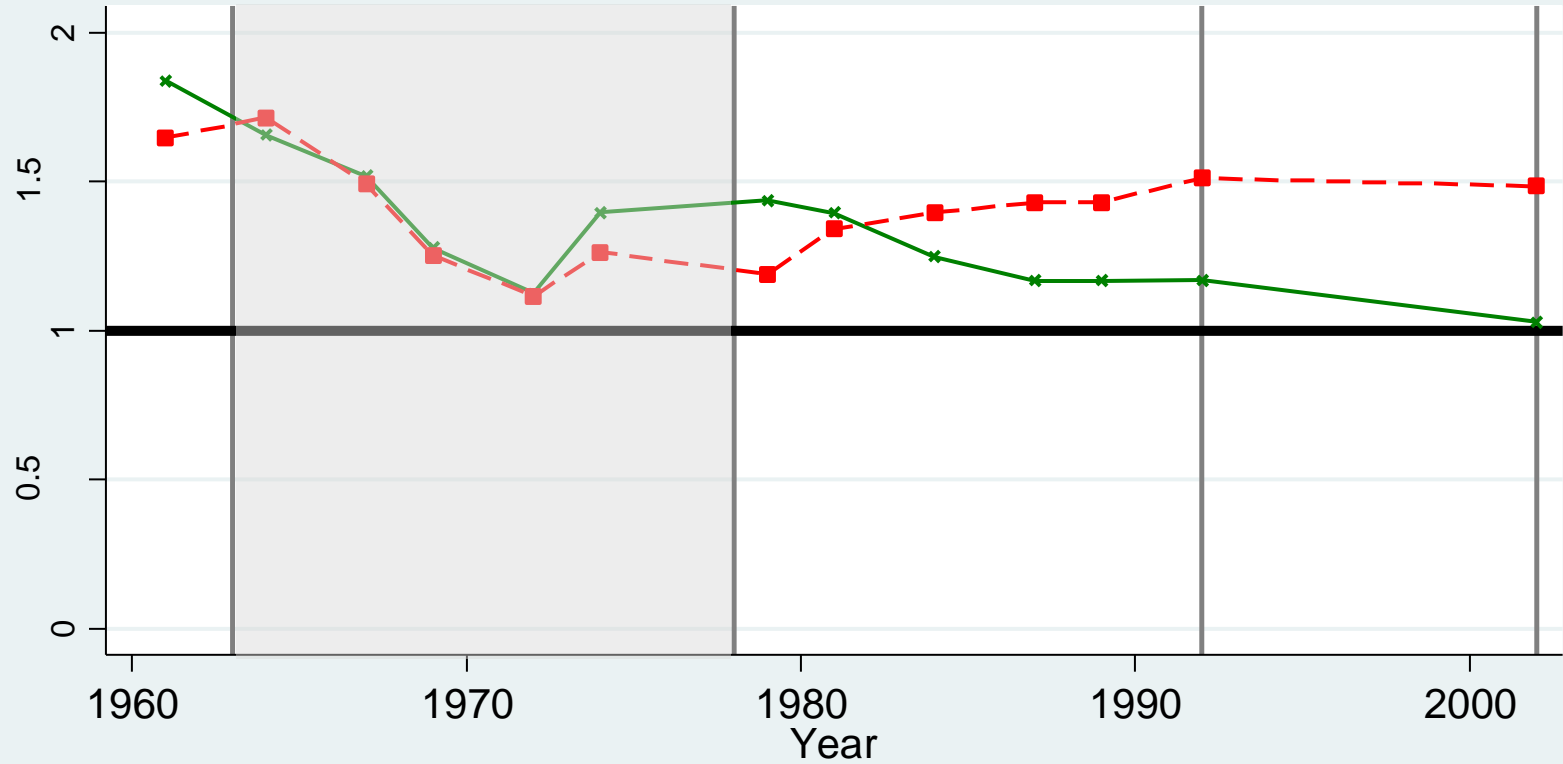
Notes: Standard errors corrected for clustering at the district level are reported in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Road length paved 1961-2002



- *— Kikuyu districts
- - - ■ - - - Kalenjin districts
- Luo districts
- . . . - . . . Luhya districts
- - - - - Kamba districts

Road length paved 1961-2002

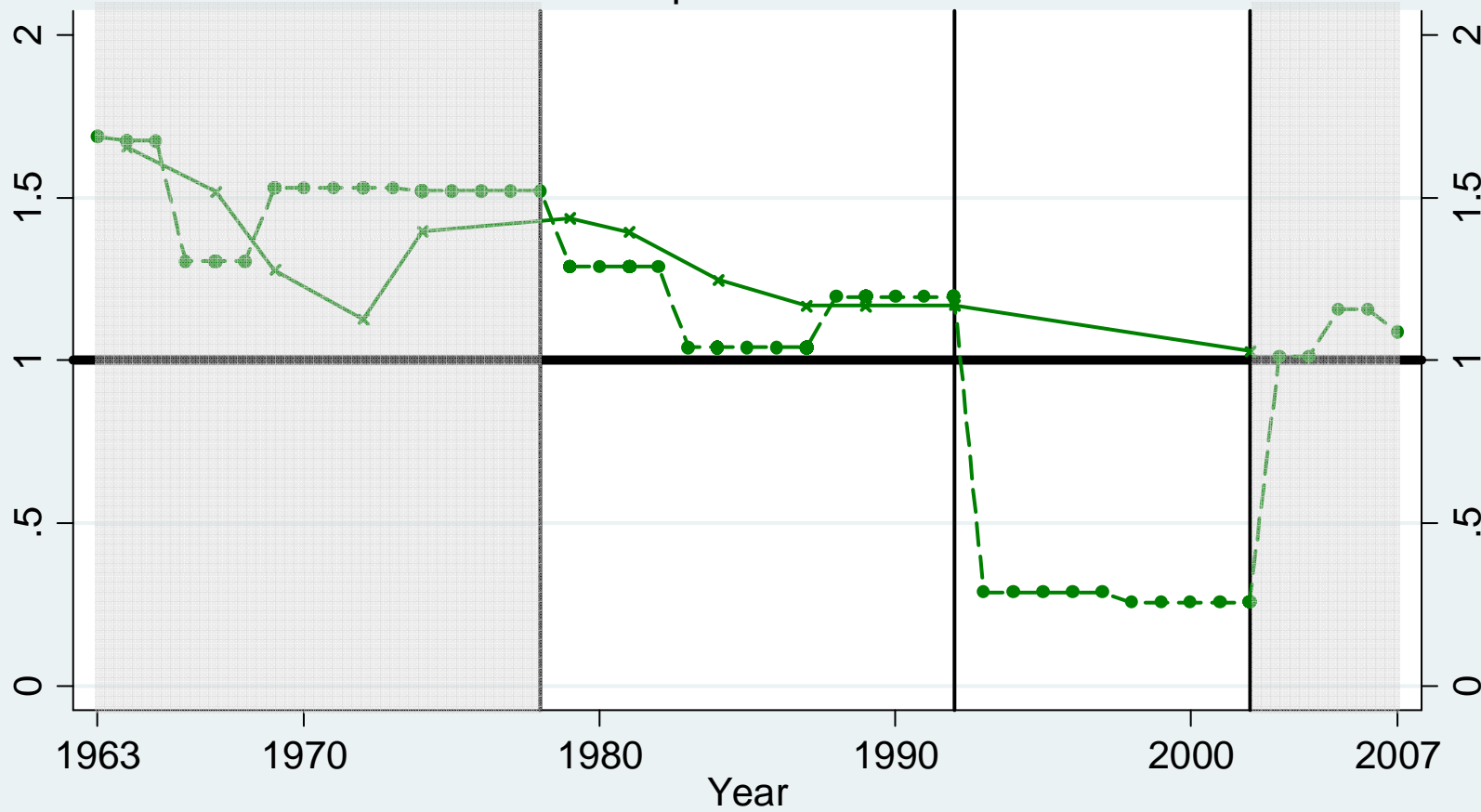


— x — Kikuyu districts

- - - ■ - - - Kalenjin districts

Kikuyu districts

Evolution of Cabinet Representation and Paved Roads

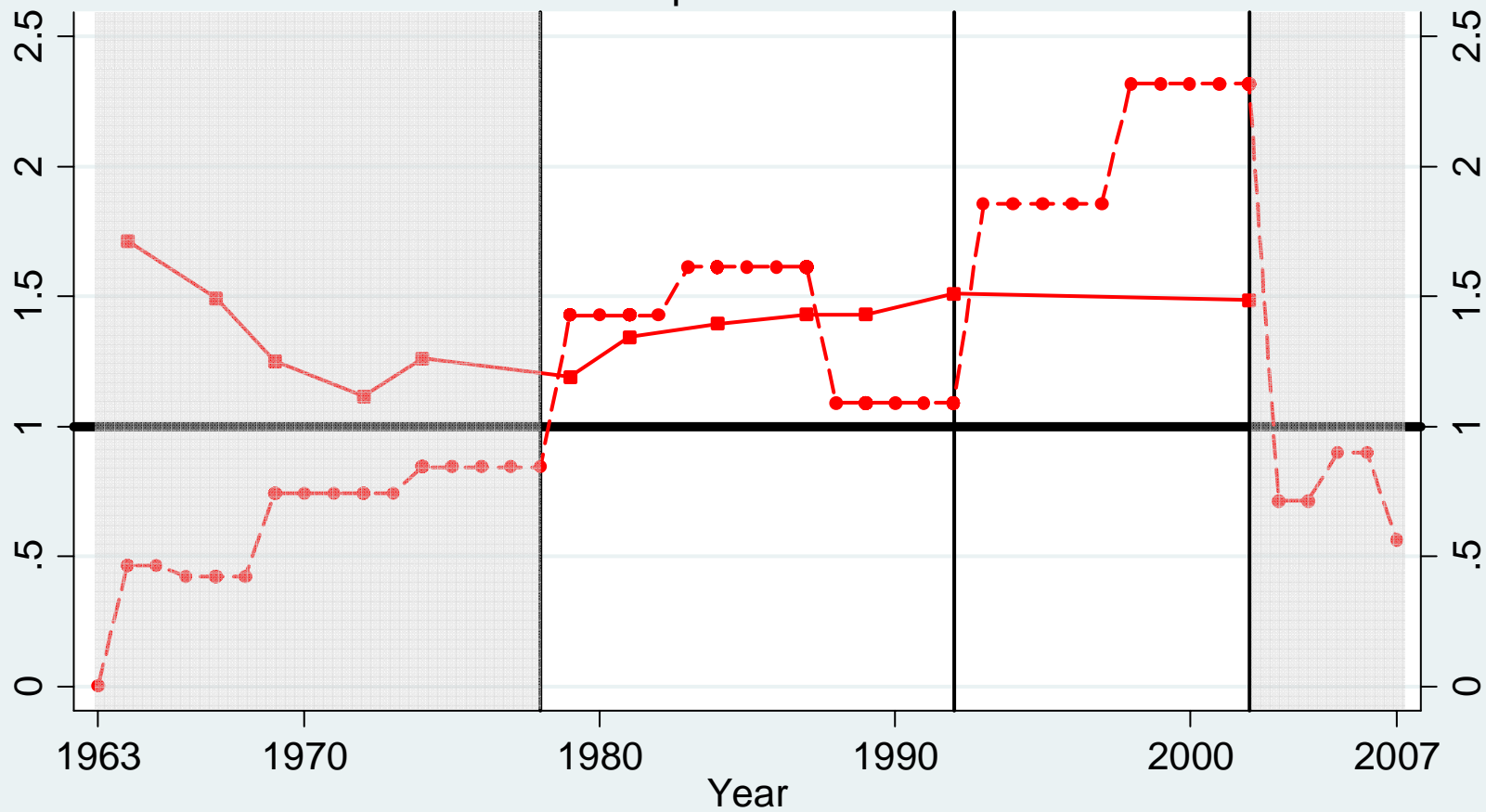


---●--- Cabinet Representation

---×--- (Share of road length paved [e,t]) / (Population share [e,1962])

Kalenjin districts

Evolution of Cabinet Representation and Paved Roads

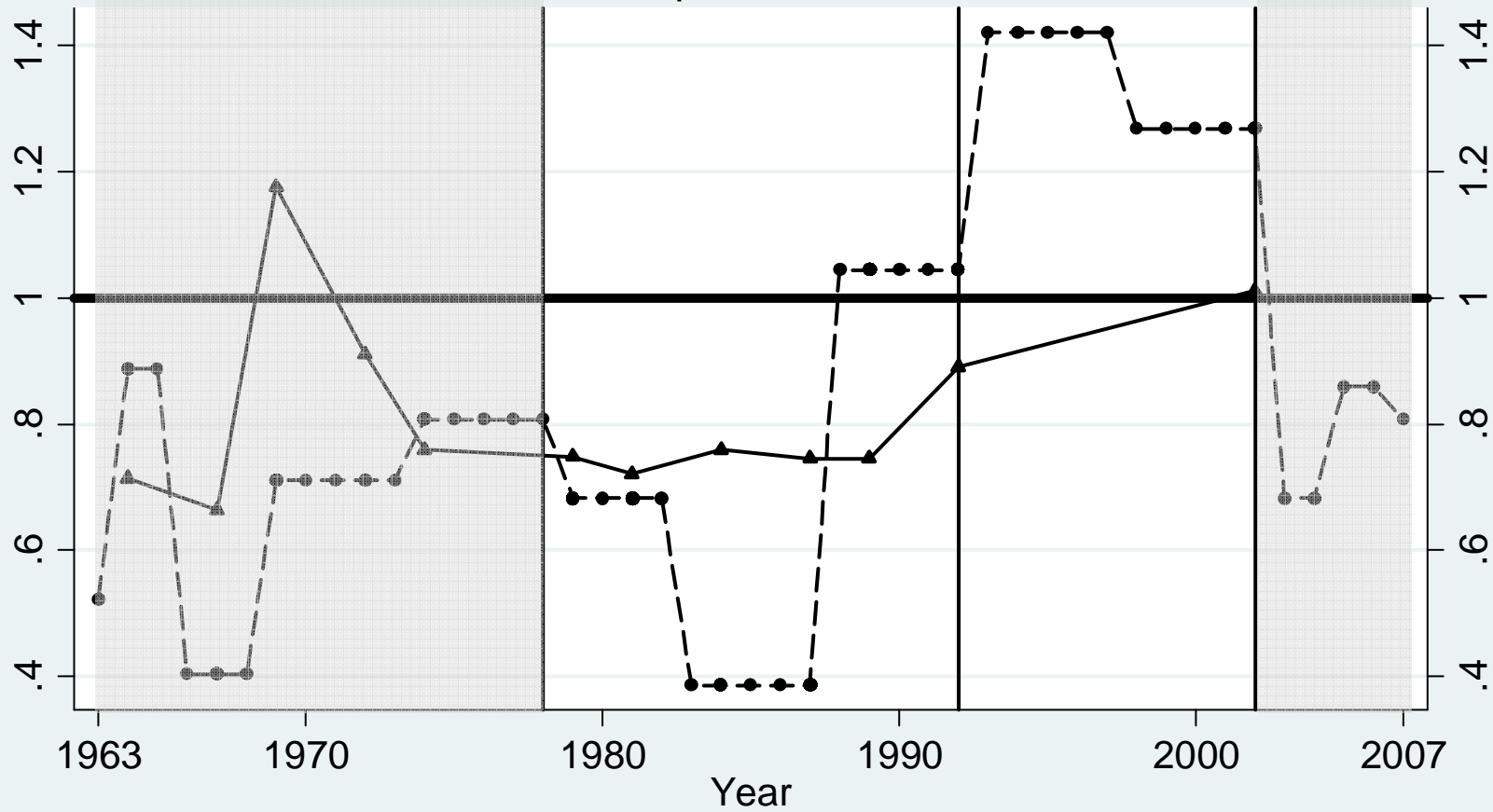


---●--- Cabinet Representation

---■--- (Share of road length paved [e,t])/(Population share [e,1962])

Kamba district

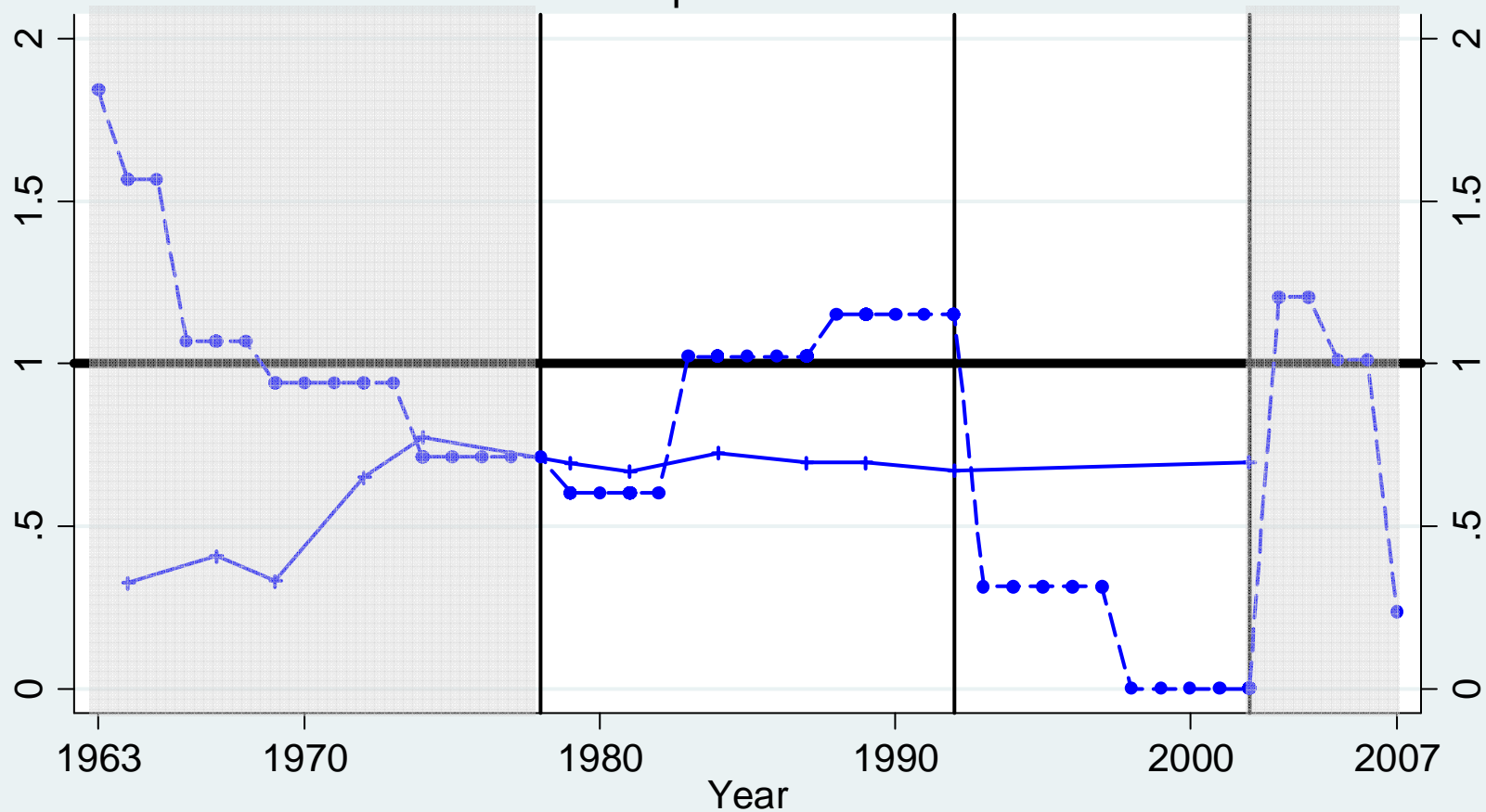
Evolution of Cabinet Representation and Paved Roads



- Cabinet Representation
- ▲--- (Share of road length paved [e,t]) / (Population share [e,1962])

Luo districts

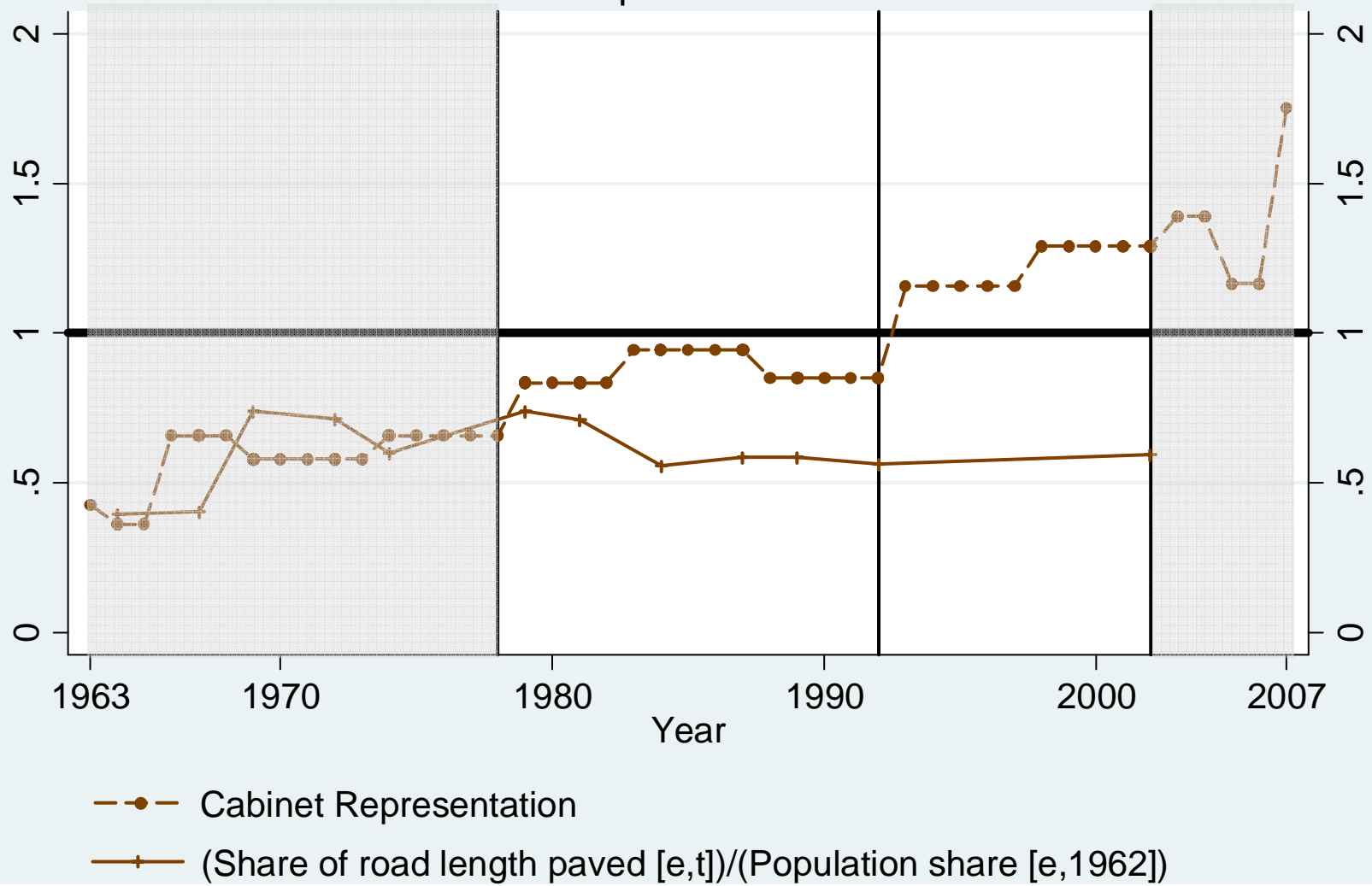
Evolution of Cabinet Representation and Paved Roads



- Cabinet Representation
- + (Share of road length paved [e,t]) / (Population share [e,1962])

Luhya districts

Evolution of Cabinet Representation and Paved Roads

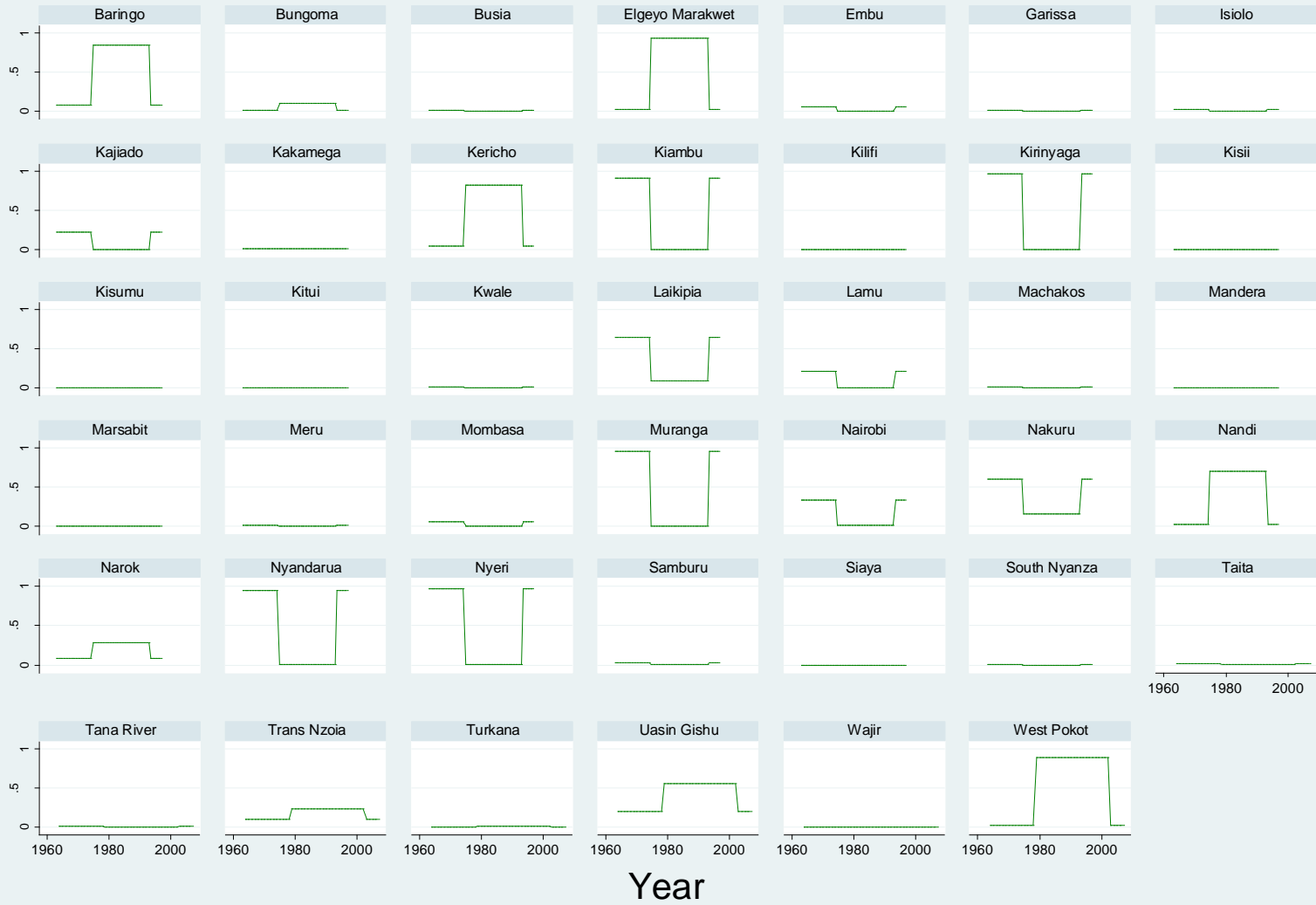


the graphical analysis suggests the following simple regression analysis

$$y_{dt} = \gamma_d + \alpha_t + \beta \textit{presshare}_{dt} + \epsilon_{dt}$$

where $\textit{presshare}_{dt}$ capture the extent to which a district shares the ethnicity of the president

President's Ethnicity



EFFECTS OF DISTRICTS SHARING PRESIDENT'S ETHNICITY ON ROAD EXPENDITURE 1974-2007

<i>Dependent variable: Share of road expenditure [d,t]/Population share [d,1962]</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
Share of president's ethnicity [d,t]	1.559*** (0.417)	1.493*** (0.438)	1.503*** (0.464)	1.449*** (0.485)	1.559*** (0.423)	1.449*** (0.492)
R-squared	0.184	0.212	0.231	0.261	0.328	0.396
Observations	1394	1394	1394	1394	1394	1394
District and year fixed effects	YES	YES	YES	YES	YES	YES
(population, area, urbanization rate)*year	NO	YES	YES	YES	NO	YES
(earnings, employment)*year	NO	NO	YES	YES	NO	YES
(main highway, border)*year	NO	NO	NO	YES	NO	YES
District time trends	NO	NO	NO	NO	YES	YES
No. of districts	41	41	41	41	41	41

Notes: Standard errors corrected for clustering at the district level are reported in parentheses; * p<0.10, ** p<0.05, *** p<0.01. Population, urbanization rate, earnings and employment are 1962 measures. Main highway is dummy if district is on the Mombasa-Kampala highway, border is a dummy if district is on the Uganda border or Tanzania border and area is district area.

EFFECTS OF DISTRICTS SHARING PRESIDENT'S ETHNICITY ON LENGTH OF PAVED ROADS 1963-2002

<i>Dependent variable: Road length paved [d,t]</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
Share of president's ethnicity [d,t]	12.666*** (4.312)	11.958** (4.661)	12.093** (4.680)	11.306* (6.093)	9.034 (10.398)	6.736 (10.775)
Road length paved [d,t-a]	0.812*** (0.054)	0.788*** (0.063)	0.801*** (0.064)	0.799*** (0.060)	0.609*** (0.067)	0.616*** (0.067)
R-squared	0.933	0.938	0.942	0.944	0.948	0.956
Observations	492	492	492	492	492	492
District and year fixed effects	YES	YES	YES	YES	YES	YES
(population, area, urbanization rate)*year	NO	YES	YES	YES	NO	YES
(earnings, employment)*year	NO	NO	YES	YES	NO	YES
(main highway, border)*year	NO	NO	NO	YES	NO	YES
District time trends	NO	NO	NO	NO	YES	YES
No. of districts	41	41	41	41	41	41

Notes: Standard errors corrected for clustering at the district level are reported in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Population, urbanization rate, earnings and employment are 1962 measures. Main highway is dummy if district is on the Mombasa-Kampala highway, border is a dummy if district is on the Uganda border or Tanzania border and area is district area.

CABINET COMPOSITION 1963-2007

Cabinet year	Kikuyu	Kalenjin	Luo	Luhya	Kamba	Kisii	Embu	Meru	Maasai	Coast	Somali	Turkana-Samburu	Other	Cabinet Size
1963	35.29%	0.00%	23.53%	5.88%	5.88%	5.88%	0.00%	5.88%	2.94%	5.88%	0.00%	0.00%	8.82%	17
1964	35.00%	5.00%	20.00%	5.00%	10.00%	5.00%	0.00%	5.00%	5.00%	5.00%	0.00%	0.00%	5.00%	20
1966	27.27%	4.55%	13.64%	9.09%	4.55%	9.09%	4.55%	4.55%	4.55%	13.64%	0.00%	0.00%	4.55%	22
1969	32.00%	8.00%	12.00%	8.00%	8.00%	8.00%	8.00%	4.00%	0.00%	8.00%	0.00%	0.00%	4.00%	25
1974	31.82%	9.09%	9.09%	9.09%	9.09%	9.09%	4.55%	4.55%	4.55%	9.09%	0.00%	0.00%	0.00%	22
1979	26.92%	15.38%	7.69%	11.54%	7.69%	11.54%	3.85%	3.85%	3.85%	7.69%	0.00%	0.00%	0.00%	26
1983	21.74%	17.39%	13.04%	13.04%	4.35%	4.35%	4.35%	4.35%	4.35%	8.70%	4.35%	0.00%	0.00%	23
1988	25.00%	11.76%	14.71%	11.76%	11.76%	5.88%	2.94%	2.94%	4.41%	5.88%	2.94%	0.00%	0.00%	34
1993	6.00%	20.00%	4.00%	16.00%	6.00%	8.00%	4.00%	8.00%	6.00%	8.00%	4.00%	0.00%	0.00%	25
1998	5.36%	25.00%	0.00%	17.86%	14.29%	7.14%	3.57%	3.57%	5.36%	10.71%	7.14%	0.00%	0.00%	28
2003	21.15%	7.69%	15.38%	19.23%	7.69%	0.00%	3.85%	7.69%	5.77%	11.54%	0.00%	0.00%	0.00%	26
2005	24.19%	9.68%	12.90%	16.13%	9.68%	3.23%	3.23%	6.45%	4.84%	6.45%	3.23%	0.00%	0.00%	31
2007	22.73%	6.06%	3.03%	24.24%	9.09%	6.06%	3.03%	3.03%	4.55%	0.00%	3.03%	0.00%	0.00%	33

EFFECTS OF DISTRICTS SHARING COALITION'S ETHNICITY ON ROAD EXPENDITURE 1974-2007

<i>Dependent variable: Share of road expenditure [d,t]/Population share [d,1962]</i>			
	(1)	(2)	(3)
Share of president's ethnicity [d,t]	1.614*** (0.424)		1.308* (0.716)
Share of coalition member's ethnicity [d,t]	0.174 (0.316)		
Aggregate representation [d,t]		1.134** (0.432)	0.374 (0.724)
R-squared	0.184	0.180	0.184
Observations	1394	1394	1394
District and year fixed effects	YES	YES	YES
Controls	NO	NO	NO
No. of districts	41	41	41

Notes: Standard errors corrected for clustering at the district level are reported in parentheses; * p<0.10, ** p<0.05, *** p<0.01.

EFFECTS OF DISTRICTS SHARING COALITION'S ETHNICITY ON PAVED ROADS 1963-2002

<i>Dependent variable: Road length paved [d,t]</i>			
	(1)	(2)	(3)
Share of president's ethnicity [d,t]	14.867** (5.530)		20.778*** (5.808)
Share of coalition member's ethnicity [d,t]	4.694 (5.021)		
Aggregate representation [d,t]		8.279 (8.030)	18.963 (11.290)
Road length paved [d,t-a]	0.812*** (0.054)	0.806*** (0.055)	0.812*** (0.054)
R-squared	0.933	0.932	0.933
Observations	492	492	492
District and year fixed effects	YES	YES	YES
Controls	NO	NO	NO
No. of districts	41	41	41

Notes: Standard errors corrected for clustering at the district level are reported in parentheses; * p<0.10, ** p<0.05, *** p<0.01.

Period	Districts	<i>Mean</i>	
		Share of road expenditure [d,t] /Population share [d,1962]	No. of Districts
1974-1978	Kalenjin	0.643	6
	Kikuyu	2.424	7
	Other	0.852	28
1979-2002	Kalenjin	2.607	6
	Kikuyu	1.098	7
	Other	1.203	28
2003-2007	Kalenjin	0.938	6
	Kikuyu	1.255	7
	Other	1.452	28

<i>Mean</i>			
Period	Districts	Share of road length paved [e,t] /Population share [e,1962]	No. of Districts
1964-1979	Kalenjin	1.31	6
	Kikuyu	1.45	7
	Other	0.95	28
1981-2002	Kalenjin	1.76	6
	Kikuyu	1.48	7
	Other	1.12	28

ROAD EXPENDITURE 1901-2007

<i>Dependent variable: Share of road expenditure [d,t]/Population share [d,1962]</i>						
	Colonial	Kenyatta	Moi	Moi-1992	Moi-2002	Kibaki
Kikuyu share [d,1979]	0.812 (0.534)	1.759** (0.741)	-0.343 (0.684)	0.138 (0.841)	-1.018 (0.874)	0.164 (0.981)
Kalenjin share [d,1979]	1.957* (0.971)	-0.240 (0.373)	1.561* (0.915)	2.212** (1.017)	0.649 (1.393)	-0.493 (1.235)
Luo share [d,1979]	-0.052 (0.388)	-0.430 (0.397)	-0.828 (0.657)	-0.818 (0.743)	-0.841 (0.952)	-1.140 (0.942)
Luhya share [d,1979]	0.185 (0.516)	0.649 (0.713)	-0.886 (0.679)	-0.748 (0.819)	-1.079 (0.997)	-1.334 (1.001)
Kamba share [d,1979]	0.029 (0.269)	0.122 (0.394)	-0.348 (0.584)	-0.786 (0.777)	0.266 (0.678)	1.497 (2.032)
R-squared	0.070	0.384	0.170	0.237	0.132	0.132
Observations	2419	205	984	574	410	205
District fixed effects	-	-	-	-	-	-
Year fixed effects	Y	Y	Y	Y	Y	Y
Controls	N	N	N	N	N	N
No. of districts	41	41	41	41	41	41
Sample	1901-1963	1964-1978	1979-2002	1979-1992	1993-2002	2003-2007
F-test [<i>p-value</i>]	1.45 [<i>0.235</i>]	7.68 [<i>0.008</i>]	6.55 [<i>0.014</i>]	6.61 [<i>0.014</i>]	2.03 [<i>0.162</i>]	0.26 [<i>0.616</i>]

Notes: Standard errors corrected for clustering at the district level are reported in parentheses; * p<0.10, ** p<0.05, *** p<0.01.

CONCLUSIONS

- ▶ strong evidence of ethnic favoritism in road spending and road building in Kenya
- ▶ clear Kikuyu-Kalenjin-Kikuyu pattern in graphical and regression analysis – having a member of your ethnic group in high office increases access to state resources
- ▶ magnitude of effects very large \Rightarrow districts which share the ethnicity of Kenyan presidents experience two to three times the spending on roads relative to those that do not
- ▶ what consequences this form of political patronage has for the development of different districts within Kenya still needs to be worked out