

Economics 270B
Ph.D. Development Economics

Professor Ted Miguel
Department of Economics
University of California, Berkeley

Lecture 12 – April 27, 2015

Economics Online Course Evaluations

1. Please take out your electronic device: laptop, tablet, phone, etc.
2. Open up a web browser; Chrome and Firefox work best.
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I. Overview of International Economic Development

Lecture 1: Understanding economic growth and development (1/26)

Lecture 1B: Persistence of historical institutions and shocks
(read during holiday week of 2/16)

Lecture 2: The Psychology of Poverty (2/2)

II. Human Capital in Economic Development

Lectures 3-4: Education (2/9, 2/23)

Lectures 5-7: Health and nutrition (3/2, 3/9, 3/16)

III. Political economy

Lectures 8-9: Democracy, Corruption and Development (3/30, 4/6)
(guest lectures by Prof. Fred Finan)

Lectures 10-11: The Political Economy of Conflict (4/13, 4/20)

Lecture 12: Ethnic and Social Divisions (4/27)

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Lecture 12: Ethnic and Social Divisions (4/27)

- Prerequisites: Graduate economic theory, econometrics
- Grading:
 - Four referee reports – 40%
 - Two problem sets – 20%
 - Research proposal – 30%
 - Due Friday 5/1
 - Class participation – 10%
 - No final exam
- All readings are available on bCourses

Any questions?

Lecture 12 outline

(0) Course evaluations

(1) Overview of ethnic divisions and economic development
(Easterly and Levine 1997, Miguel 2004)

(2) The role of democratic institutions, Burgess et al (2015)

(3) Efficiency consequences within firms, Hjort (2014)

(1) Ethnic divisions and development

- Easterly and Levine (1997, *QJE*) is a seminal contribution in this literature within Economics
- Documents the correlation between country level ethnic diversity and a range of economic and public policy outcomes 1965-1990
- Following Mauro (1995), they get around the endogeneity issue in cross-country regression by using ethnolinguistic fractionalization (ELF), which was measured decades earlier and that they claim is historically determined and largely stable over time

(1) Ethnic divisions and development

- ELF was originally constructed by Soviet anthropologists in the 1960s
- Like a Herfindahl index of industry concentration, it takes on values from 0 (all individuals belong to the same ethnic group) to 1 (total diversity):

$$ELF = 1 - \sum_i (p_i)^2$$

where the proportion of each ethnic group i is denoted p_i

TABLE III
ETHNOLINGUISTIC FRACTIONALIZATION INDEX (ETHNIC)
(66 COUNTRIES, 1960)

Country	ETHNIC	Country	ETHNIC
<i>15 Most fractionalized:</i>		<i>15 Least fractionalized:</i>	
Tanzania	93	Haiti	1
Uganda	90	Japan	1
Zaire	90	Portugal	1
Cameroon	89	Hong Kong	2
India	89	Yemen	2
South Africa	88	Germany	3
Nigeria	87	Burundi	4
Ivory Coast	86	Dominican Republic	4
CAR	83	Egypt	4
Kenya	83	Ireland	4
Liberia	83	Italy	4
Zambia	82	Norway	4
Angola	78	Iceland	5
Mali	78	Jamaica	5
Sierra Leone	77	Jordan	5

ETHNIC measures the probability that two randomly selected persons from a given country will not belong to the same ethnolinguistic group. The more groups there are, the higher ETHNIC. The more equally distributed the groups, the higher the ETHNIC.

Source. Taylor and Hudson [1972].

(1) Ethnic divisions and development

- Main result: high levels of ELF are associated with much slower economic growth during 1965-1990

$$GDP \text{ per capita growth}_i = a + b(ELF)_i + cX_i + e_i$$

- Their estimate is $b = -0.02$ (t-statistic = 3.2). So going from $ELF=1$ to $ELF=0$ increases annual per capita growth by around 2 points on average

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polarization

- They then relate ethnic diversity to a range of public policy and political outcomes, and argue that effects mainly work through public investment, rather than through political instability or violence – a result that surprised many:
“Ethnically fragmented economies may find it difficult to agree on public goods and good policies.”

TABLE VI
DETERMINANTS OF ECONOMIC INDICATORS

Dependent variable	C	ETHNIC	R^2	Number of observations
Log of schooling	1.508 (17.12)	-0.991 (-6.21)	0.08,0.09,0.10	83; 85; 91
Assassinations	1.24E-05 (1.52)	1.03E-06 (0.07)	-0.01,-0.06,-0.02	98; 105; 105
Financial depth	0.417 (11.44)	-0.266 (-3.67)	0.09,0.06,-0.02	94; 100; 103
Black market premium	0.070 (1.82)	0.252 (3.39)	0.05,0.08;-0.04	97; 107; 106
Fiscal surplus/ GDP	-0.026 (-5.48)	-0.013 (-1.37)	-0.14,-0.02,-0.13	55; 87; 82
Log of telephones per worker	4.331 (18.95)	-3.067 (-7.17)	0.21,0.23,0.04	95; 103; 92

(1) Ethnic divisions and development

- Interpretation issues

(1) Is ELF really “exogenous”? What omitted variables could be related to ethno-linguistic diversity?

-- An important one might be the country's history of political centralization (a la Bockstette et al 2004), e.g., France in 1800 versus 1900

-- Empires lead to linguistic and cultural homogenization (contrast China with Zambia)

-- Nunn (2008, *QJE*) finds that areas more exposed to slave training are more ethnically diverse today, suggesting that adverse consequences of the slave trade are important

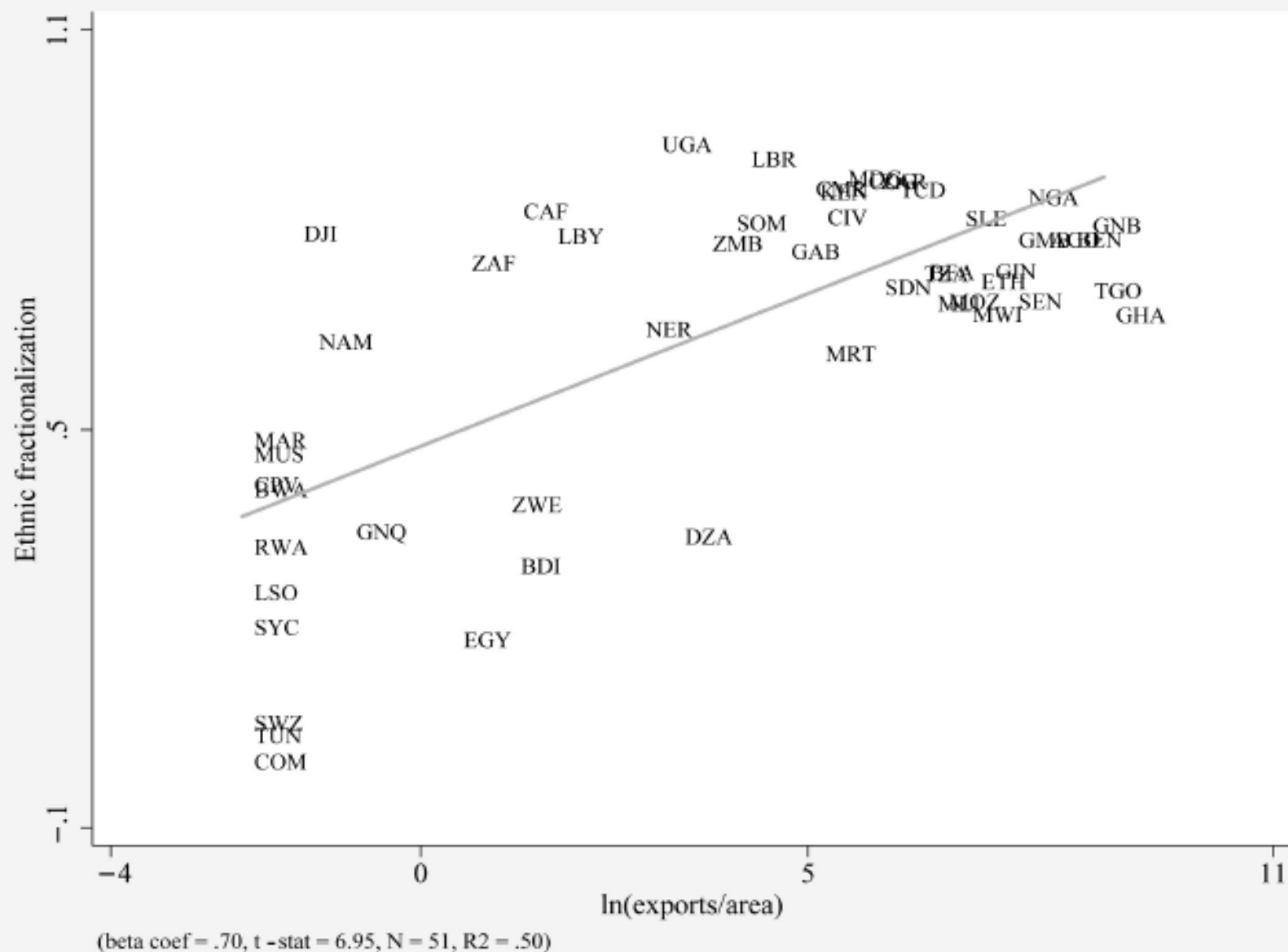


FIGURE VI
 Relationship between Slave Exports and Current Ethnic Fractionalization

(1) Ethnic divisions and development

- Interpretation issues (continued)

(2) What are the main channels for diversity effects?

-- What role for public policy, versus private sector productivity effects? (E.g., Hjort 2014, Burgess et al 2015)

(3) (Related) What is the “right” way to model and understand a negative diversity effect?

-- Some assume different preferences (Alesina et al 1999), others focus on differences in communication, coordination and sanctioning across groups (Miguel and Gugerty 2004)

(1) Ethnic divisions and development

- Interpretation issues (continued)

(2) What are the main channels for diversity effects?

-- What role for public policy, versus private sector productivity effects? (E.g., Hjort 2014, Burgess et al 2015)

(3) (Related) What is the “right” way to model and understand a negative diversity effect?

-- Some assume different preferences (Alesina et al 1999), others focus on differences in communication, coordination and sanctioning across groups (Miguel and Gugerty 2004)

(4) What can be done to address negative diversity effects?

-- Institutional solutions? (Segregation?)

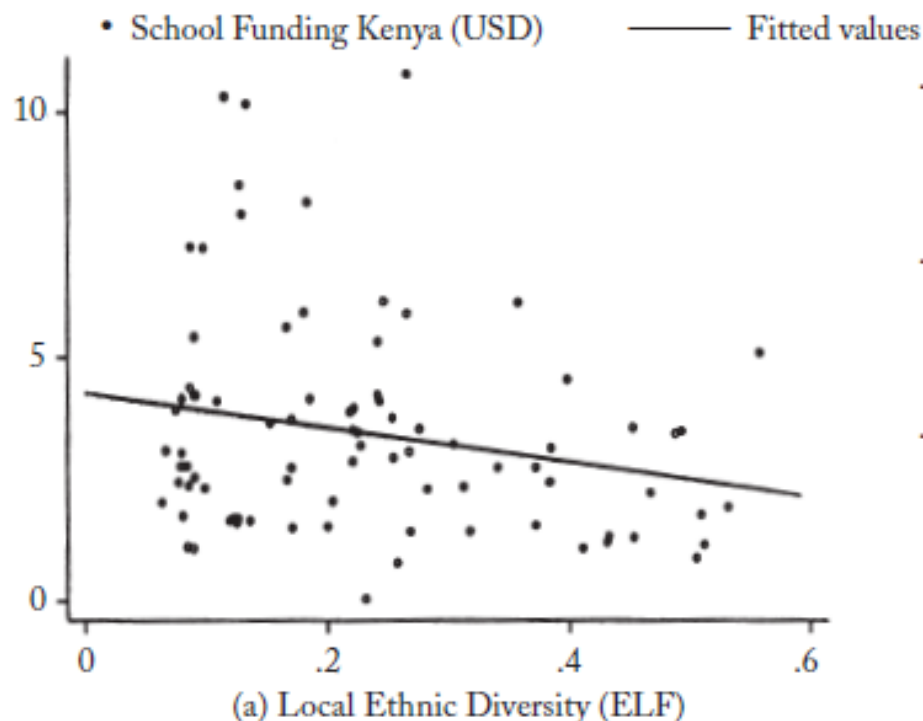
(1) Ethnic divisions and development

- Can national “political culture”, as shaped by leaders, play a role in dampening negative effects?
- Case study of Kenyan villages to the north of Lake Victoria, versus Tanzanian villages to the south (Miguel 2004)
- Similar ethnic diversity and political histories before independence, but sharp divergence after: Kenyan leaders consistently exploited ethnic divisions for short-run gains
- Tanzania’s independence leader (Julius Nyerere) launched an ambitious “**nation-building**” effort: promoting Swahili, abolishing traditional chiefs, equalizing public investments, placing civil servants and students across the country, etc.

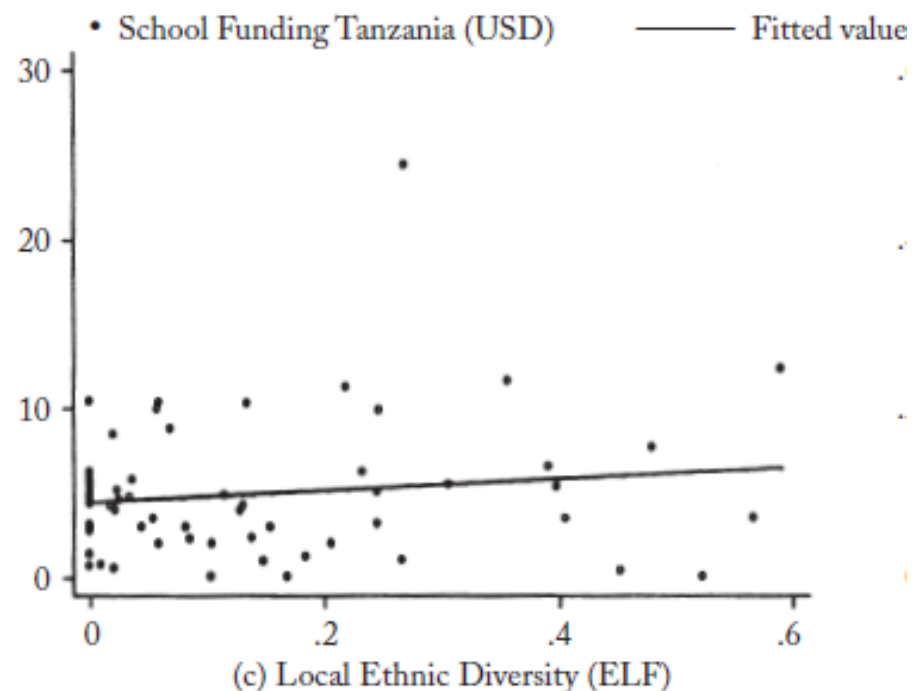
(1) Ethnic divisions and development

- Forty years later, ethnic diversity is associated with lower funding for schools and water wells across the Kenya villages, but not the Tanzanian communities

(1) Ethnic divisions and development



Busia, Kenya: total local primary school funds per pupil (2001 U.S. dollars) in 1995 versus local ethnolinguistic fractionalization



Meatu, Tanzania: total local school funds per pupil (2001 U.S. dollars) per year in 1997–2002 versus village ethnolinguistic fractionalization

(1) Ethnic divisions and development

- Forty years later, ethnic diversity is associated with lower funding for schools and water wells across the Kenya villages, but not the Tanzanian communities
- Structured interviews in both settings are suggestive:
 - In Kenya, extensive mistrust reported among parents due to “rivalry over ownership” of the school across tribes in one of the most diverse schools, leading to no classroom construction
 - In Tanzania, “We are all Tanzanians”, “This is Tanzania – we do not have that sort of problem here”; “They simply live as Tanzanians”

D. PDSner

Mandani

- Limitations include small sample (N=2 countries), possible non-random sorting across communities, other policies.

(2) Democracy and divisions (Burgess et al 2015)

(2) Democracy and divisions (Burgess et al 2015)

- Could other institutional changes (beyond nation-building policies) also reduce the salience or impact of ethnic divisions?
- This paper has two main goals:
 - Quantify ethnic favoritism in public investment
 - Examine whether democracy affects ethnic favoritism

(2) Democracy and divisions (Burgess et al 2015)

- The role of democracy in exacerbating or moderating these effects is important for Sub-Saharan Africa
 - The return of multiparty democracy to most of Africa in the 1990s is a milestone
 - Democratic institutions were common in the post-independence 1960s, but were rare in the 1980s, 1990s
- Democracy may impose constraints on rulers via multiple channels (electoral accountability, judiciary, media scrutiny)
- Model the constraints on the executive in a framework related to Padro i Miquel (2007), and then empirically quantify the impact of democracy on ethnic favoritism.

Figure 2: Evolution of Political Regimes in Sub-Saharan Africa, 1963-2011



Notes: This figure plots the revised combined polity score for Kenya and the population weighted average for the rest of Sub-Saharan Africa. Polity IV defines regimes in three categories: autocracies (-10 to -6), anocracies (-5 to +5) and democracies (+6 to +10). Red vertical lines indicate regime changes in Kenya: December 1969 is the transition from democracy to autocracy, while December 1992 is the return of democracy. Data sources and construction are described in Appendix A and Appendix E: Table A2.

(2) Democracy and divisions (Burgess et al 2015)

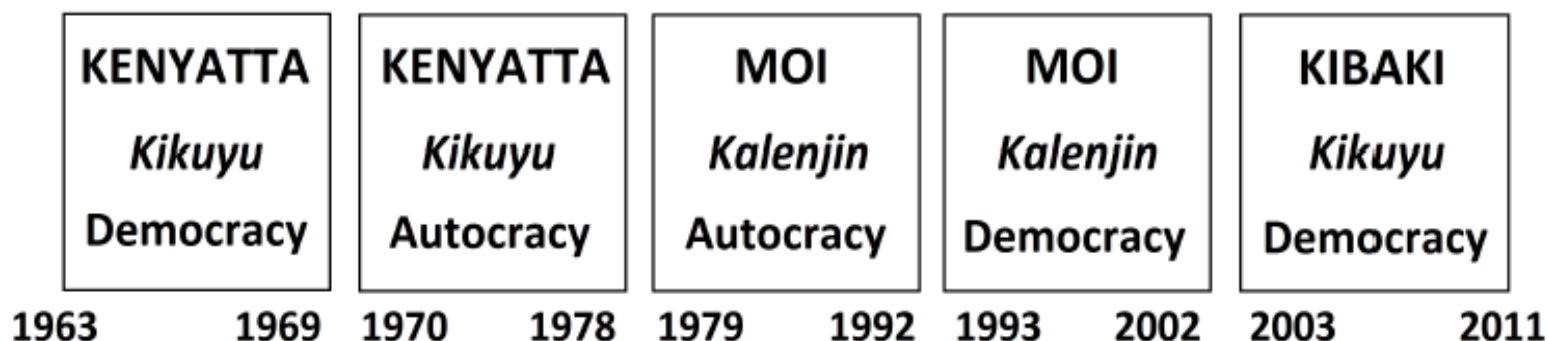
- Focus on road building in Kenya, which accounts for 15% of all development expenditures (health, education and water are roughly 5% each)
- Road building is centrally controlled
- Track total expenditures and length of roads constructed for 41 districts from independence (1963) to 2011
- Length based on non-governmental Michelin maps
- Due to the construction of boundaries by the British, each district is dominated by a single ethnic group (tribe)

(2) Democracy and divisions (Burgess et al 2015)

- Three presidents during the period (Kenyatta – Kikuyu, Moi – Kalenjin, Kibaki – Kikuyu) with a shift out of democracy under Kenyatta and into democracy under Moi, allowing us to identify the democracy “effect” under the same leader.

(2) Democracy and divisions (Burgess et al 2015)

Figure 1: Political and Leadership Transitions in Kenya, 1963-2011



Notes: This timeline illustrates the history of political transitions and leadership transitions in Kenya. Political transitions are as follows: December 1969 is the transition from democracy to autocracy, while December 1992 is the return of democracy. Leadership transitions: from Kenyatta (Kikuyu) to Moi (Kalenjin) in August 1978, and from Moi (Kalenjin) to Kibaki (Kikuyu) in December 2002.

DHS

Kwame
Pomer

(2) Democracy and divisions (Burgess et al 2015)

- Model builds on Padro i Miquel (2007), Besley and Persson (2011)
- Two ethnic groups living in distinct districts
- Derive the leader's optimal allocation of public resources across districts, and the tax rate, as a function of the strength of constraints on the executive
- Constraints formalized as how “biased” targeting can be
- Leaders take into account how their choices affect their ability to retain power (which is a function of citizen outcomes), while maximizing rent extraction

(2) Democracy and divisions (Burgess et al 2015)

- **Result (summary):** stronger constraints on the executive (θ in the model) limit the degree of ethnic favoritism in resource allocation
- Can empirically quantify θ under different regimes by estimating the extent of ethnic targeting of public resources.

(2) Democracy and divisions (Burgess et al 2015)

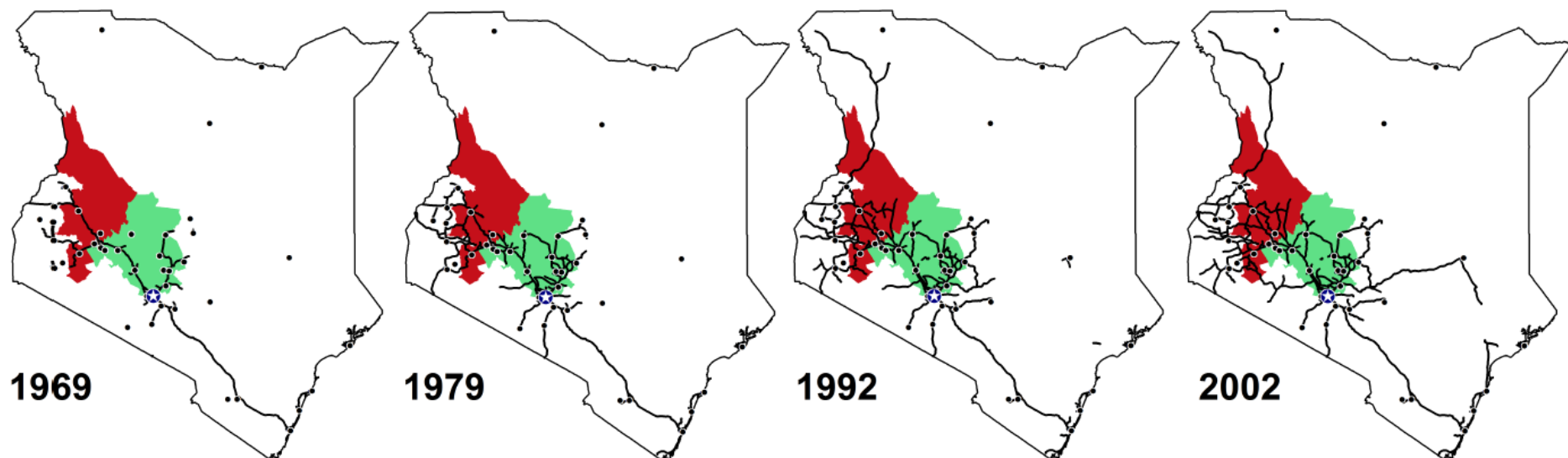
- The establishment of district boundaries by the British means that districts were largely ethnically homogeneous in 1963, and have remained so since then
- The alternation of Kikuyu and Kalenjin presidents allows us to test for ethnic favoritism

(2) Democracy and divisions (Burgess et al 2015)

- The establishment of district boundaries by the British means that districts were largely ethnically homogeneous in 1963, and have remained so since then
- The alternation of Kikuyu and Kalenjin presidents allows us to test for ethnic favoritism
- The shift between democracy and autocracy within the rule of particular presidents allows us to test to what extent democratic institutions constrain ethnic favoritism
- Roads are a natural arena to test for these effects, as the largest single central government development expenditure

Figure 3: Evolution of Kenya's Paved Road Network

Panel A: Actual Network



(2) Democracy and divisions (Burgess et al 2015)

- Road building increases substantially in districts dominated by the president's ethnic group: roughly a **doubling of road funding per capita**, and three times the length of road
- This increase occurs almost entirely in non-democratic periods, and falls close to zero during periods of multi-party democracy
- Consistent with the view that greater democratic accountability constraints leaders' ability to distort public investment allocations in favor of their own group.

Figure 4: Road Expenditure in Presidential Coethnic and Non-Coethnic Districts, 1963-2011

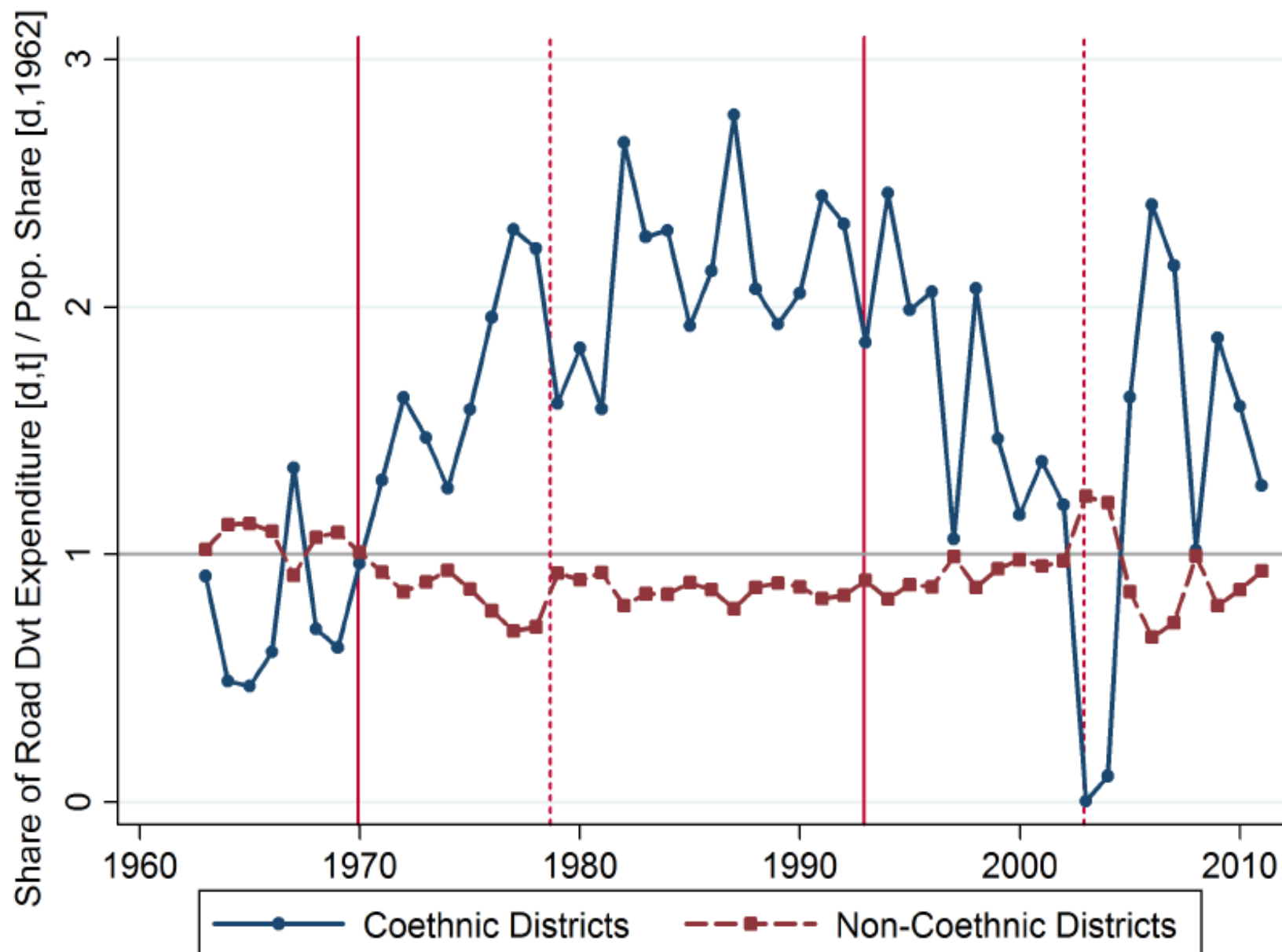
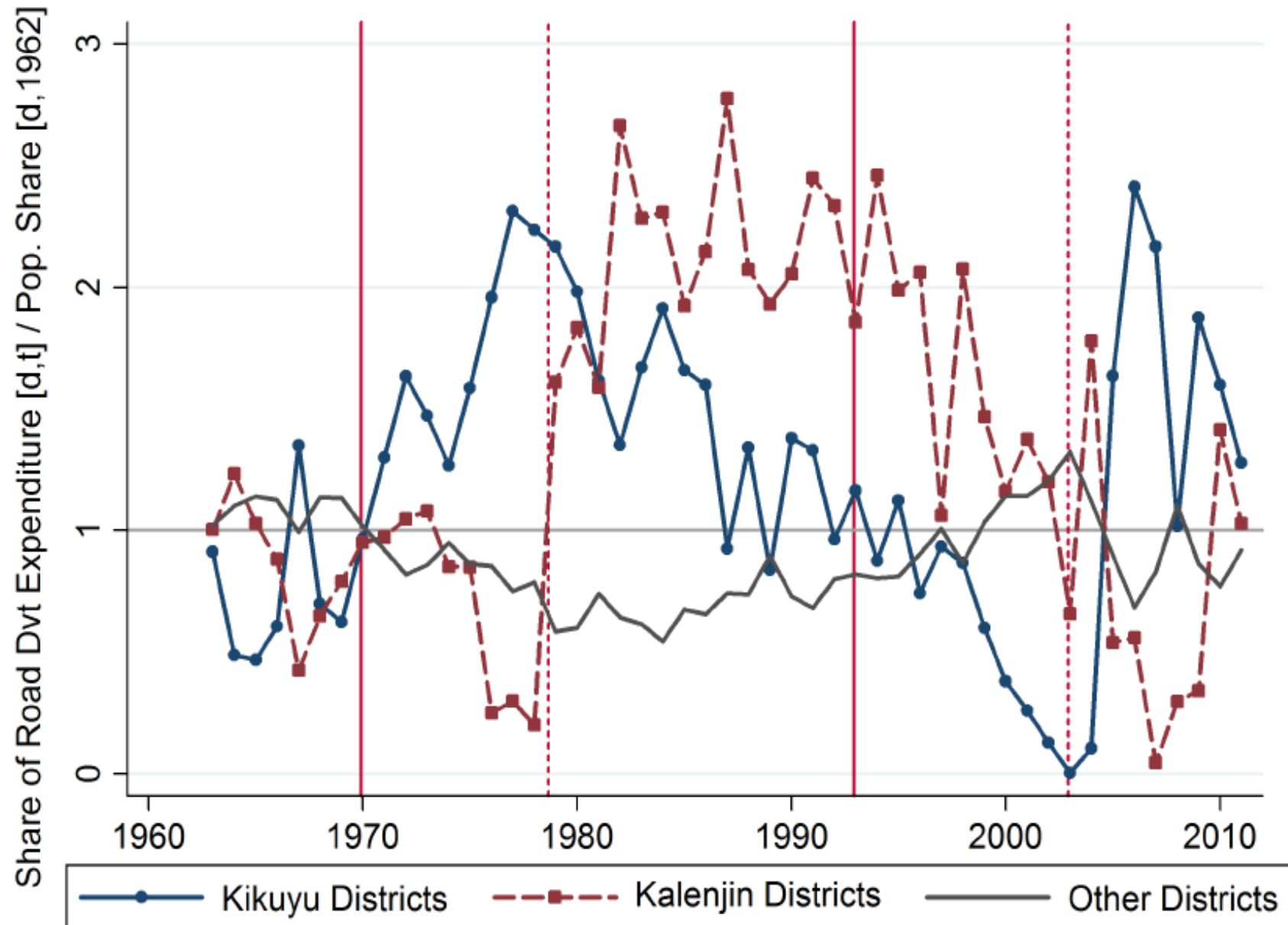


Figure 5: Road Expenditure in Kikuyu, Kalenjin and Other Ethnic Districts, 1963-2011



In the regression approach, our main estimating equation takes the following form:

$$\begin{aligned} road_{dt} = & \gamma_d + \alpha_t + \beta(coethnic\ district_{dt}) \\ & + \delta(coethnic\ district_{dt} \times democracy_t) + \theta(X_{d1963} \times [t - 1963]) + u_{dt} \end{aligned}$$

where the dependent variable is the road spending or road construction measure for year t and district d as described above.¹⁷ To capture coethnicity with the president, we use an indicator variable ($coethnic\ district_{dt}$) that takes a value of one for districts where at least 50% of the population has the same ethnic affiliation as the serving president. The $democracy_t$ term is an indicator variable which takes a value of one during periods of multiparty democracy (1963-1969 and 2003-2011).¹⁸ X_{d1963} is a vector of baseline demographic, economic and geographic variables all obtained in the early to mid 1960s that might affect road spending and construction. We interact these initial conditions with linear time trends $[t-1963]$ to allow their impact to vary over time. This allows us to control for a wide range of factors that might influence where road spending or road construction takes place. The regression also controls for district fixed effects (γ_d) and year fixed effects (α_t), and standard errors are clustered at the district level.

(2) Democracy and divisions (Burgess et al 2015)

- Econometric identification issues: are these patterns driven by omitted variables, or simply a coincidence (i.e., the areas coethnic with the sitting president just happened to be where roads were most useful?)
- Multiple ways to assess this:
 1. Robust to a large number of controls
 2. Robust to dropping the wealthiest areas (the former White Highlands, Nairobi)
 3. Counterfactual simulation: build roads sequentially post-independence in high market potential areas (based on population and distance) → same correlations?

(2) Democracy and divisions (Burgess et al 2015)

Table 1: Road Expenditure, Ethnicity and Democratic Changes in Kenya, 1963-2011

<i>Dependent Variable</i>	Share of road development expenditure [d,t]				
	Population share [d,1962]				
	(1)	(2)	(3)	(4)	(5)
<i>Panel A</i>					
Coethnic District [d,t]	0.97*** (0.36)	0.96*** (0.35)	0.96*** (0.35)	1.00*** (0.35)	0.97** (0.38)
<i>Panel B</i>					
Coethnic District [d,t]	1.57*** (0.49)	1.62*** (0.49)	1.64*** (0.49)	1.72*** (0.49)	1.56*** (0.51)
Coethnic District [d,t] * Democracy [t]	-1.11* (0.61)	-1.24* (0.63)	-1.27** (0.63)	-1.32** (0.62)	-1.08* (0.59)
F-test [<i>p-value</i>]	1.07	0.76	0.73	0.88	1.22
H ₀ : Coethnic + (Coethnic*Democracy) = 0	[0.31]	[0.39]	[0.40]	[0.36]	[0.28]
Observations	2009	2009	2009	2009	2009
Year and District fixed effects	Y	Y	Y	Y	Y
(Population, Area, Urbanization Rate)*trend	N	Y	Y	Y	N
(Earnings, Employment, Cash Crops)*trend	N	N	Y	Y	N
(Main Highway, Border, Dist. Nairobi)*trend	N	N	N	Y	N
District time trends	N	N	N	N	Y

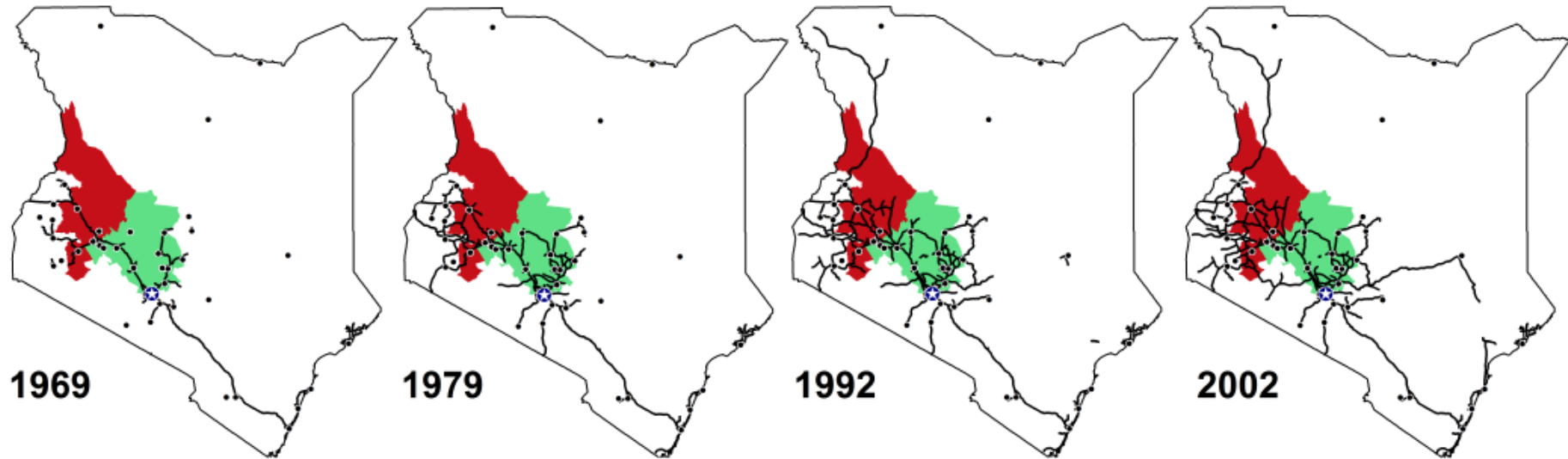
(2) Democracy and divisions (Burgess et al 2015)

Table 2: Road Building, Ethnicity and Democratic Changes in Kenya, 1964-2002

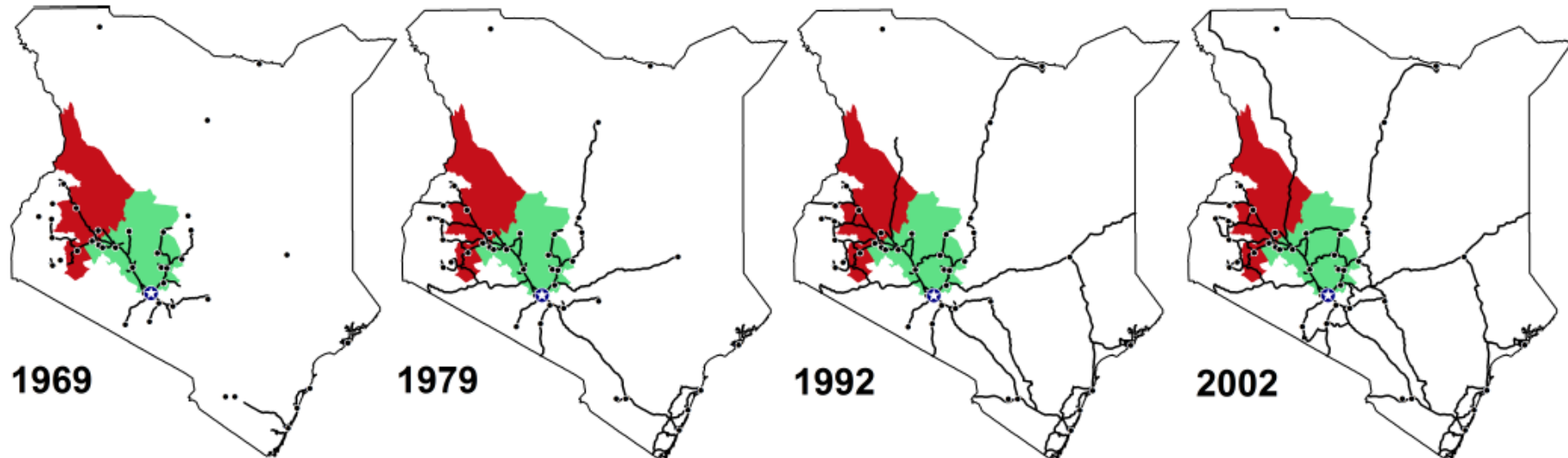
<i>Dependent Variable</i>	<div> <div>Share of paved road construction [d,t]</div> <div>Population share [d,1962]</div> </div>				
	(1)	(2)	(3)	(4)	(5)
Panel A					
Coethnic District [d,t]	1.91** (0.94)	1.94* (0.99)	2.20* (1.09)	3.71** (1.69)	3.92* (2.20)
Panel B					
Coethnic District [d,t]	3.00** (1.23)	3.03** (1.26)	3.19** (1.33)	4.26** (1.74)	3.28 (2.21)
Coethnic District [d,t] * Democracy [t]	-3.55** (1.38)	-3.61** (1.36)	-3.45** (1.32)	-2.38* (1.36)	-3.27** (1.39)
F-test [<i>p-value</i>]	0.44	0.49	0.10	0.98	0.00
H ₀ : Coethnic + (Coethnic*Democracy) = 0	[0.51]	[0.49]	[0.75]	[0.33]	[0.99]
Observations	410	410	410	410	410
Year and District fixed effects	Y	Y	Y	Y	Y
(Population, Area, Urbanization Rate)*trend	N	Y	Y	Y	N
(Earnings, Employment, Cash Crops)*trend	N	N	Y	Y	N
(Main Highway, Border, Dist. Nairobi)*trend	N	N	N	Y	N
District time trends	N	N	N	N	Y

Figure 3: Evolution of Kenya's Paved Road Network

Panel A: Actual Network



Panel B: Counterfactual Network based on Population and Distance (Market Potential)



— Paved Road Kikuyu Districts Kalenjin Districts ★ Nairobi • Town/City (1962)

(2) Democracy and divisions (Burgess et al 2015)

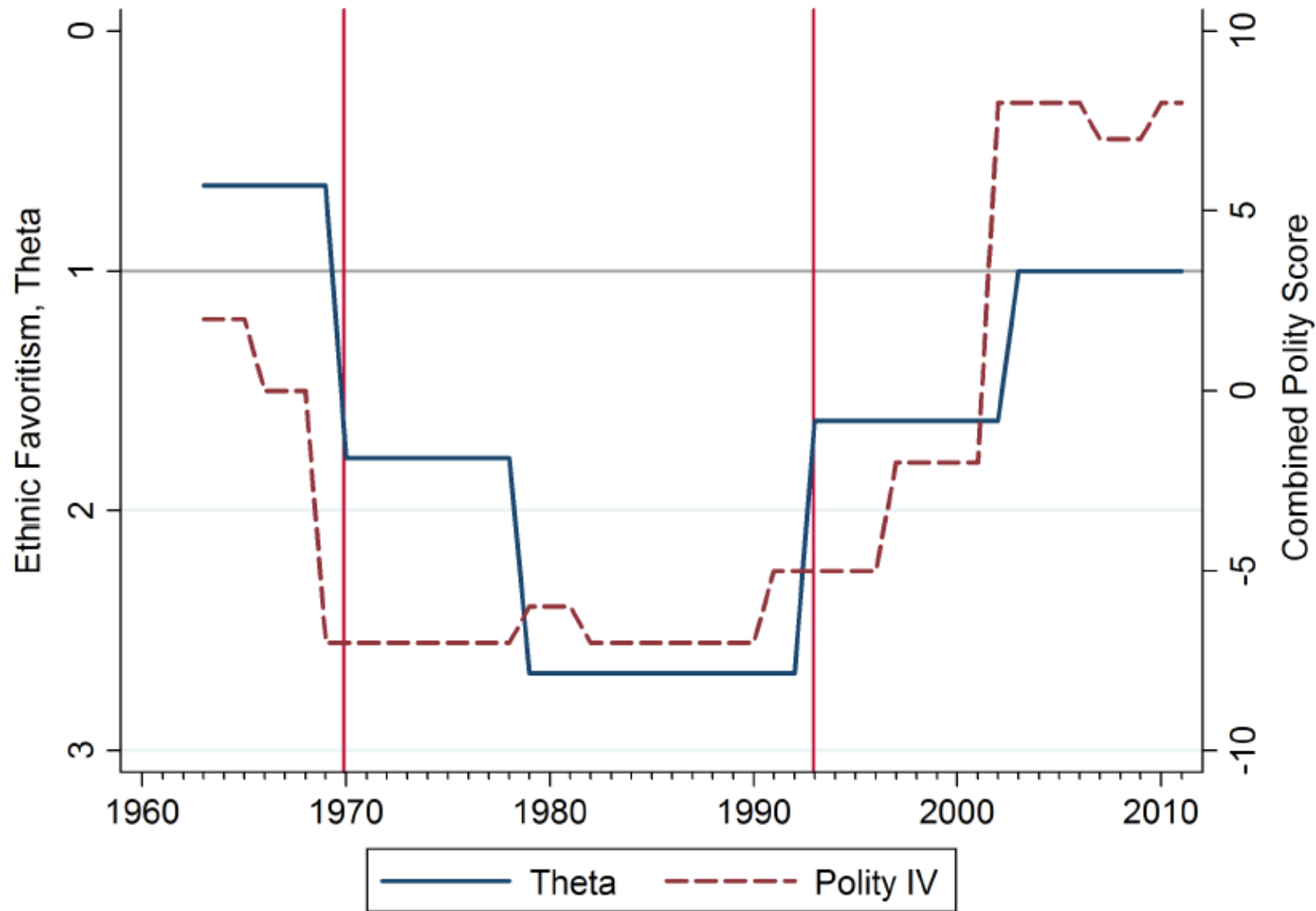
Table 3: Counterfactual Road Building, Ethnicity and Democratic Changes in Kenya, 1964-2002

<i>Dependent Variable</i>	Share of paved road construction [d,t] Population share [d,1962]		
	Population	Distance	Population and Distance (Market Potential)
<i>Counterfactual Ranking</i>	(1)	(2)	(3)
<i>Panel A</i>			
Coethnic District [d,t]	0.22 (0.44)	-0.56 (1.21)	0.67 (1.03)
<i>Panel B</i>			
Coethnic District [d,t]	0.20 (0.52)	-0.57 (1.14)	0.34 (1.08)
Coethnic District [d,t] * Democracy [t]	0.08 (1.38)	0.05 (1.34)	1.38 (2.24)
F-test [<i>p-value</i>]	0.05	0.08	0.64
H ₀ : Coethnic + (Coethnic*Democracy) = 0	[0.82]	[0.78]	[0.43]
Observations	410	410	410
Year and District fixed effects	Y	Y	Y
Controls*trend	Y	Y	Y

(2) Democracy and divisions (Burgess et al 2015)

- Strong correspondence between periods of democracy and less ethnic favoritism

Figure 6: Ethnic Favoritism and Political Regimes in Kenya, 1963-2011



(2) Democracy and divisions (Burgess et al 2015)

- Strong correspondence between periods of democracy and less ethnic favoritism
- Why? Less definitive answers, but evidence that civil society, independent media, greater legislative independence and scrutiny all played a key role
- E.g., the number of newspaper articles written about government roads projects doubled immediately after the return to multi-democracy in 1992.

(2) Democracy and divisions (Burgess et al 2015)

- Focusing on a setting (Kenya) where ethnic divisions are central to politics, we quantify the extent of ethnic favoritism and document how it is moderated during periods of multi-party democracy
- Broader implications for our understanding of Africa's mass democratization in the 1990s: has it helped to constrain the deleterious effects of ethnic divisions documented in Easterly and Levine (1997)?

(2) Democracy and divisions (Burgess et al 2015)

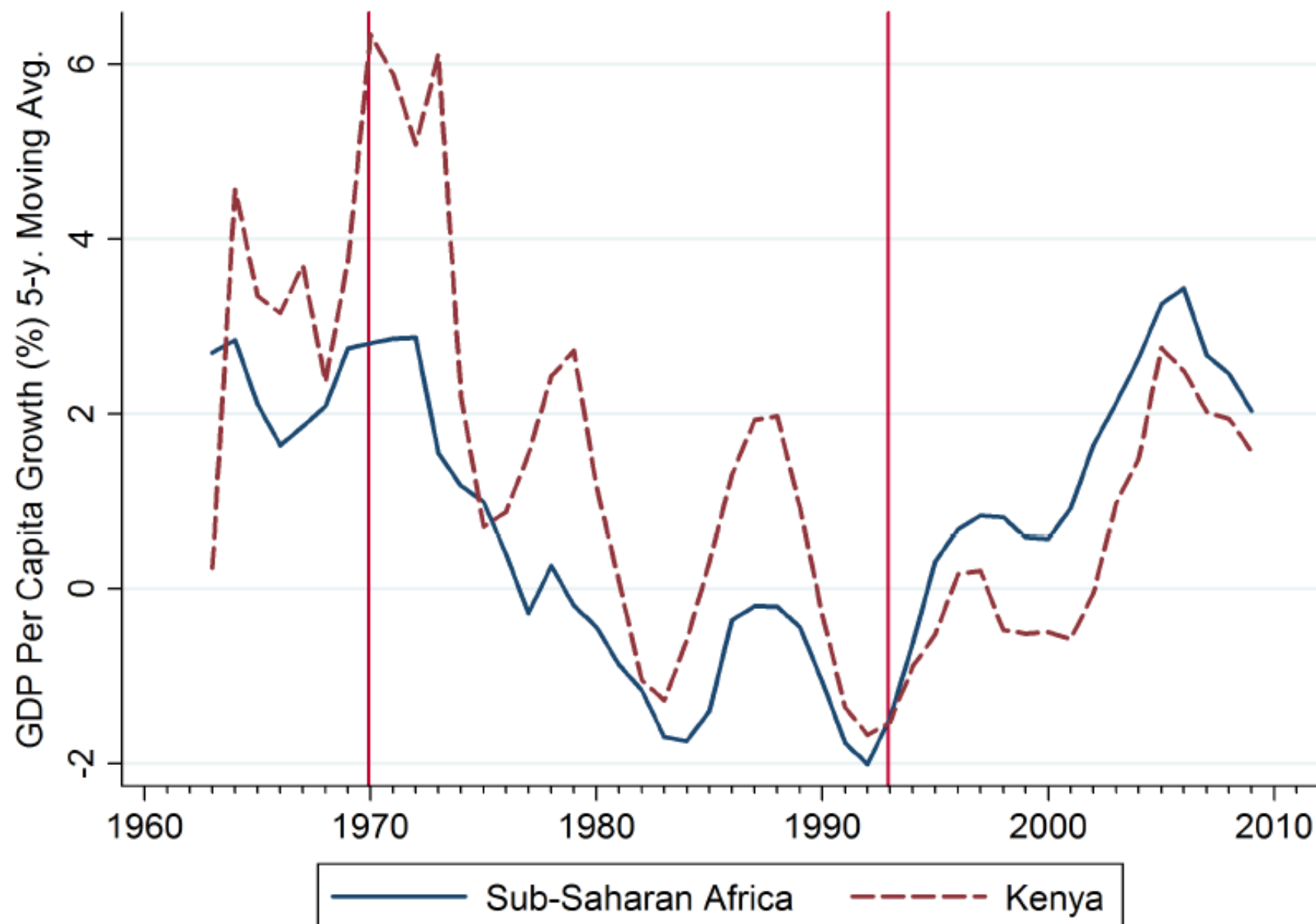
Table 6: Economic Growth, Ethnic Diversity and Democratic Changes Across Countries, 1960-2010

<i>Dependent Variable</i>	Growth of Per Capita Real GDP [c,t]			
<i>Sample: Decades:</i>	World 1960s-1980s (1)	World 1960s-2000s (2)	World 1960s-2000s (3)	Africa 1960s-2000s (4)
Ethnic [c,1960]	-0.017*** (0.006)	-0.006 (0.005)	-0.015* (0.008)	-0.023* (0.011)
Ethnic [c,1960] * Democracy [c,t]			0.013 (0.009)	0.036** (0.015)
Democracy [c,t]			-0.002 (0.005)	-0.018 (0.012)
F-test [<i>p-value</i>]			0.10	0.05
H ₀ : Ethnic + (Ethnic*Democracy) = 0			[0.76]	[0.83]
Observations	312	528	500	182
Controls	Y	Y	Y	Y

(2) Democracy and divisions (Burgess et al 2015)

- Focusing on a setting (Kenya) where ethnic divisions are central to politics, we quantify the extent of ethnic favoritism and document how it is moderated during periods of multi-party democracy
- Broader implications for our understanding of Africa's mass democratization in the 1990s: has it helped to constrain the deleterious effects of ethnic divisions documented in Easterly and Levine (1997)?
- Does the rise (and fall, and rise) of democracy since independence in Africa have something to do with macroeconomic growth patterns? Suggestive patterns

Figure 7: Evolution of GDP per capita growth in Sub-Saharan Africa, 1963-2011



(3) Production within firms (Hjort 2014)

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- If poor communication, lack of coordination and differences preferences exist across ethnic groups, this could also translate into lower productivity in the private sector
- E.g., peer effects are important in the workplace (Mas and Moretti 2009)

(3) Production within firms (Hjort 2014)

- If poor communication, lack of coordination and differences preferences exist across ethnic groups, this could also translate into lower productivity in the private sector
- E.g., peer effects are important in the workplace (Mas and Moretti 2009)
- Investigates this in a team production setting in a Kenyan flower plant (packing roses for export to Europe)
- N=924 workers observed daily (i.e., number of flowers packed) over 2007-2008 → 200,000 observations
- Are **ethnically diverse teams** less productive?

(3) Production within firms (Hjort 2014)

- Two main ethnic “blocks” in Kenya circa 2007-8, led by Kikuyu and Luo ethnic groups
- Roughly 50-50 division of workers in this flower packing plant in each of two groups
- Work teams of 3 people: one (upstream) supplier, and two (downstream) processors. Piece rate pay.

(3) Production within firms (Hjort 2014)

- Two main ethnic “blocks” in Kenya circa 2007-8, led by Kikuyu and Luo ethnic groups
- Roughly 50-50 division of workers in this flower packing plant in each of two groups
- Work teams of 3 people: one (upstream) supplier, and two (downstream) processors. Piece rate pay.
- The supplier does some basic sorting and cleaning of the cut flowers, and then distributes them to processors
- Given supplier of ethnicity A, three types of teams: (i) homogeneous (2 coethnic processors), (ii) horizontally mixed (1 coethnic), (iii) vertically mixed (0 coethnics)

(3) Production within firms (Hjort 2014)

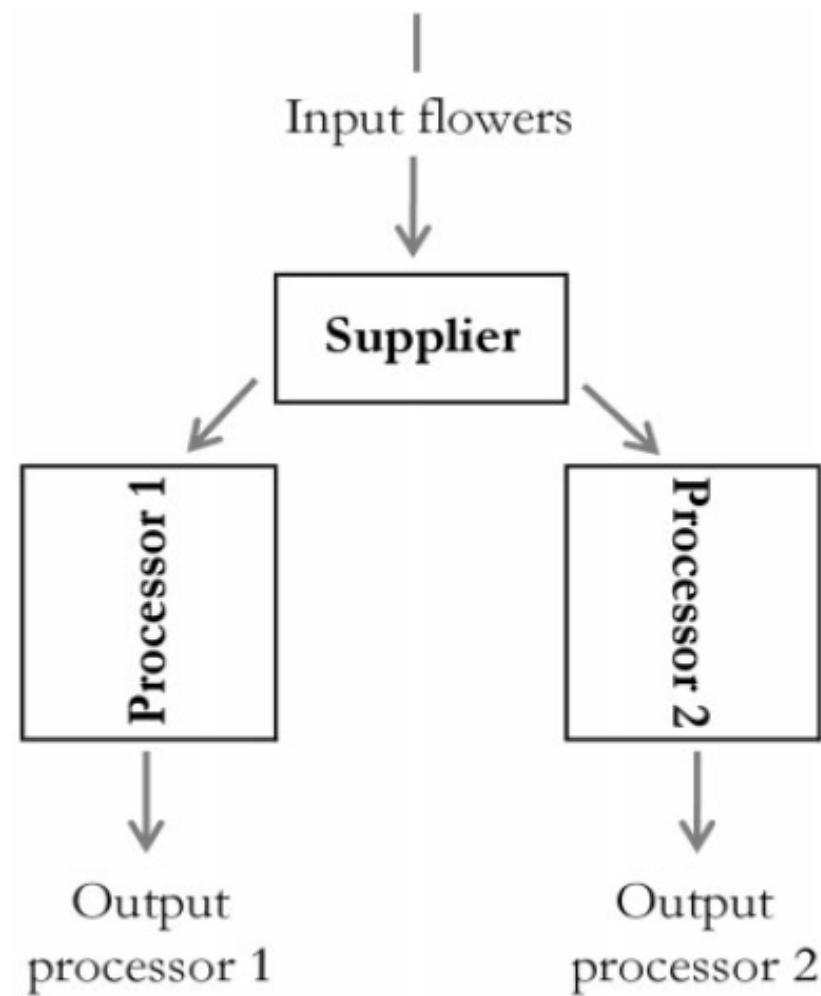


FIGURE I

Organization of Team Production

(3) Production within firms (Hjort 2014)

- Econometric identification: plant uses a **quasi-random “rotation” system** of workers across teams
- All workers work for 18 days, then have 2 days leave
- Workers are brought back into teams wherever there is an opening, in the order in which they took leave
- Hjort claims that there is minimal to no sorting in the process; that supervisors are largely unaware of any adverse consequences of diverse teams
- A range of checks indicate that the ethnic composition of a team is unrelated to worker characteristics, previous productivity, etc.

(3) Production within firms (Hjort 2014)

- Hjort models the behavior of suppliers, allowing for **taste-based discrimination**, i.e., processor outcomes enter into utility function with some weight (positive, negative), building on Becker (1974)
- Coethnic bias: place more weight on members of the same tribe (or ethnic block)
- Allow work effort to be costly (convex)

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- Coethnic bias: place more weight on members of the same tribe (or ethnic block)
- Allow work effort to be costly (convex)
- This could lead to two forms of inefficiency:
 1. “Vertical” discrimination: upstream suppliers provide fewer flowers to non-coethnic processors
 2. “Horizontal” discrimination: suppliers provide excess flowers to coethnic processors

(3) Production within firms (Hjort 2014)

- Several notable aspects of this paper:
 - Detailed individual level worker productivity data
 - Unusually simple team work setting allows for realistic theoretical modeling of incentives (i.e., $N=3$ per team)
 - Most importantly, **two natural experiments** during the period allow him to study how preferences change due to politics, and the impact of policy changes
- Natural experiments: (1) election violence along ethnic lines in late 2007 / early 2008; (2) move to a team based piece rate contract for workers shortly later
- Key graphic: Figure II

(3) Production within firms (Hjort 2014)

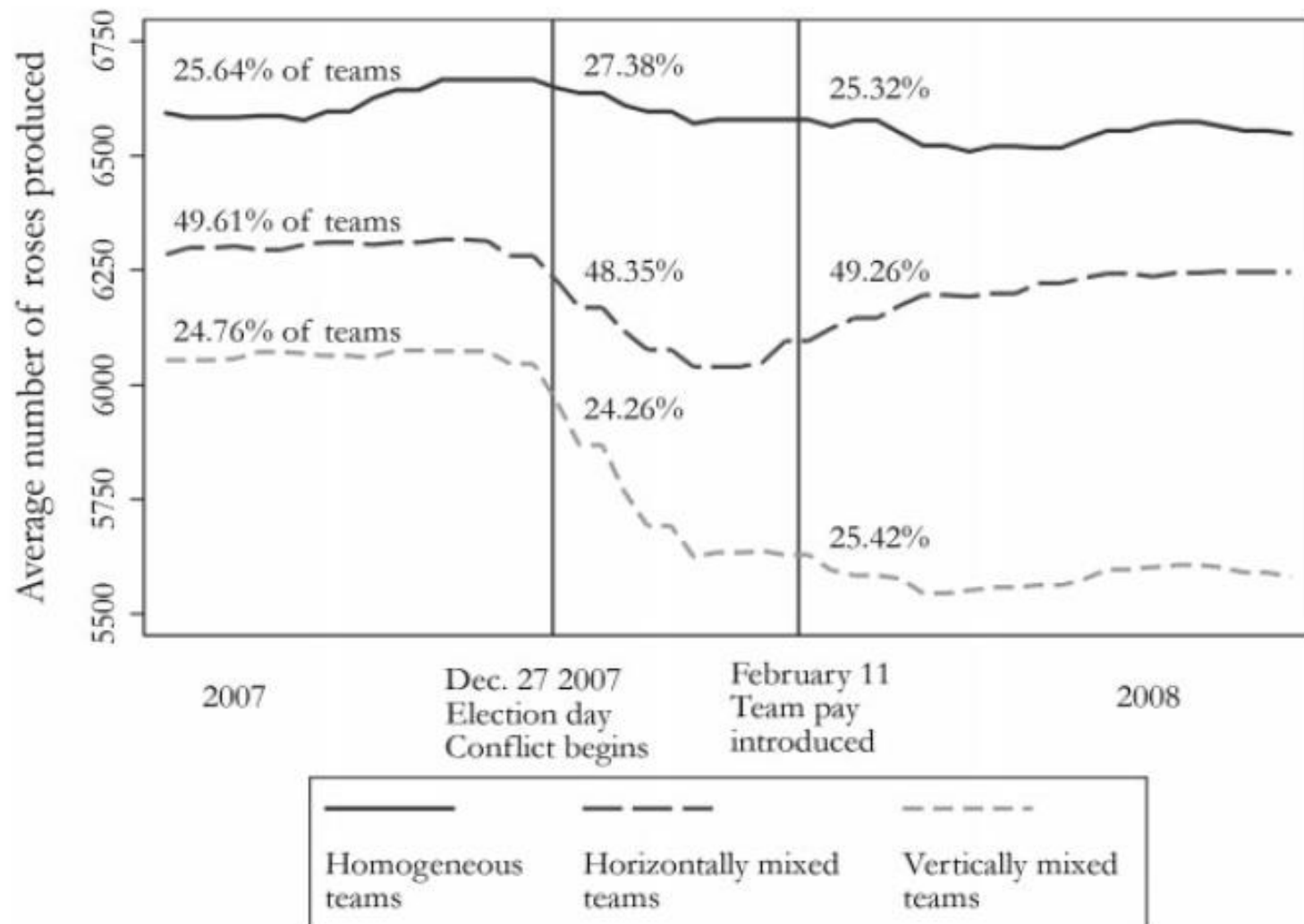


FIGURE II

Output in Homogeneous and Mixed Teams across Time

(3) Production within firms (Hjort 2014)

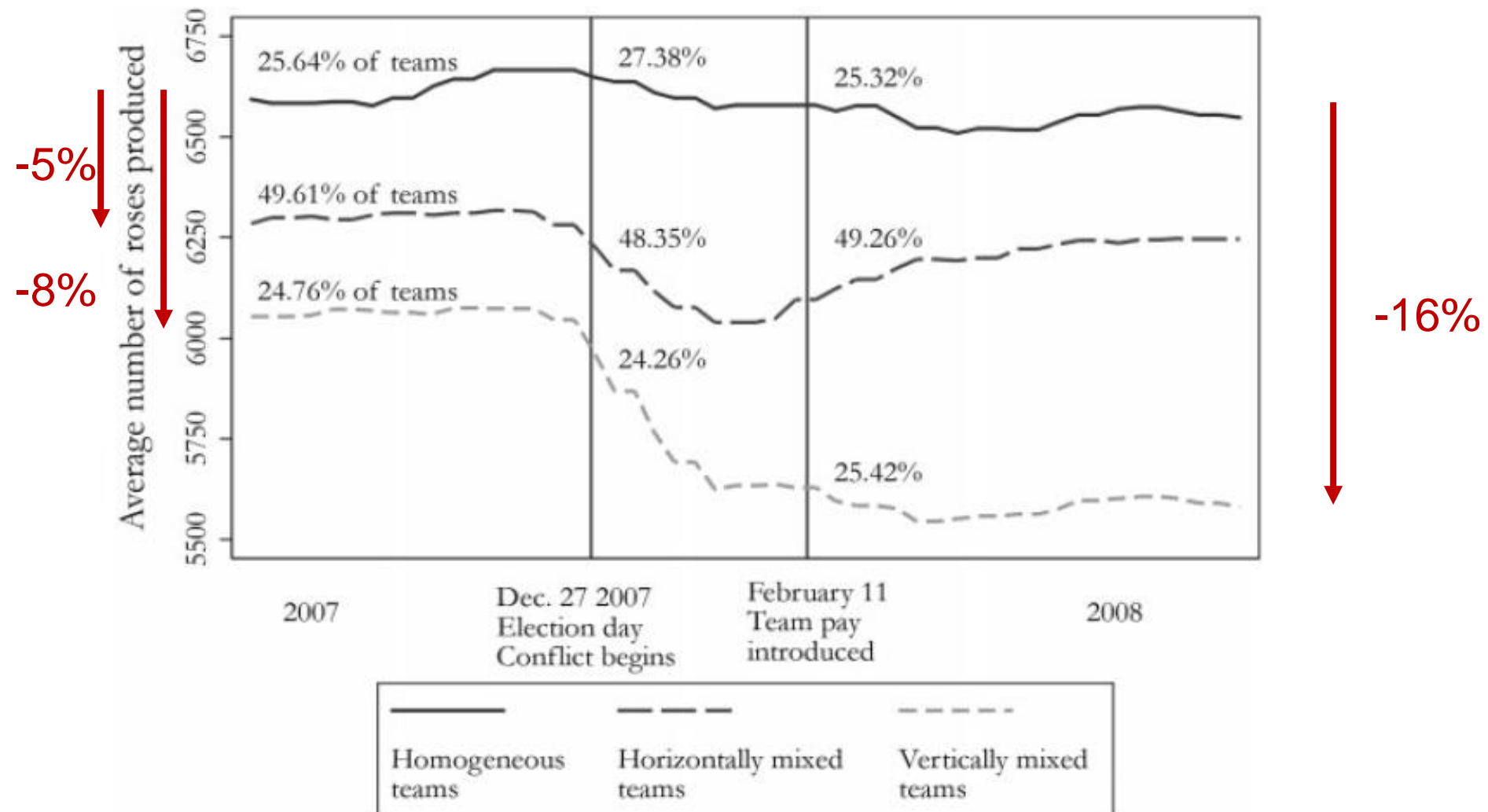


FIGURE II

Output in Homogeneous and Mixed Teams across Time

(3) Production within firms (Hjort 2014)

- Summary of findings:
 1. In period 1, vertically (horizontally) mixed teams are 8% (5%) less productive than homogeneous teams
 - In horizontally mixed teams, coethnic processors earn 24% more than non-coethnics
 2. In period 2, the output gaps roughly double
 - Coethnic (non-coethnic) processors' earnings rise (fall)
 3. In period 3, output increases in horizontally mixed teams due to less misallocation across processors
 - Overall output increases, despite incentive effects of team pay (free-riding). A second-best “solution”?

(3) Production within firms (Hjort 2014)

- Other interesting patterns:
- Kikuyu and Luo suppliers behave in remarkably similar ways (Figure III)

(3) Production within firms (Hjort 2014)

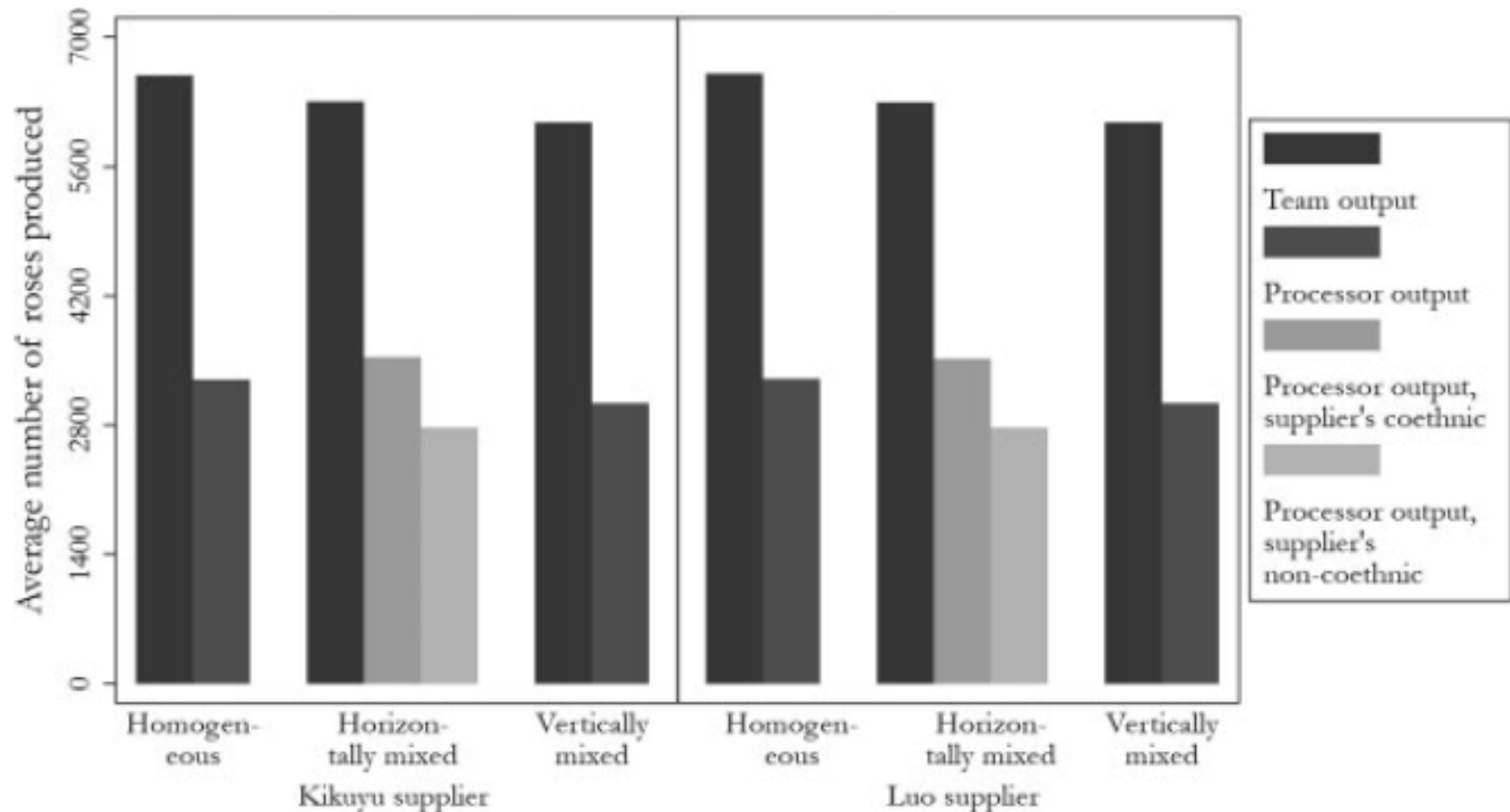


FIGURE III

Output by Team Ethnicity Configuration

Data from 2007.

(3) Production within firms (Hjort 2014)

- Other interesting patterns:
- Kikuyu and Luo suppliers behave in remarkably similar ways (Figure III)
- In regression specifications including individual worker-position fixed effects, results are statistically significant
- Same holds in narrow sample of “switchers” (Table III)

(3) Production within firms (Hjort 2014)

TABLE III
OUTPUT BY TEAM ETHNICITY CONFIGURATION

Sample	(1)	(2)	(3)	(4)
	Preconflict		Preconflict, incoming/outgoing worker of same productivity tercile	
	Log (processor output)	Log (team output)	Log (unswitched processor output)	Log (team output)
Constant (H)	8.153*** (0.024)	8.846*** (0.029)	8.018*** (0.056)	8.729*** (0.065)
Horizontally mixed (HM)		-0.046*** (0.001)		
Horizontally mixed, processor of supplier's ethnicity (HM,C)	0.070*** (0.002)			
Horizontally mixed, processor not of supplier's ethnicity (HM,NC)	-0.181*** (0.002)			
Vertically mixed (VM)	-0.084*** (0.002)	-0.083*** (0.001)		
H to HM	Worker switched Either P			-0.051*** (0.005)
H to HM,C	Other P		0.064*** (0.006)	
H to VM	Supplier		-0.076***	-0.076***

(3) Production within firms (Hjort 2014)

TABLE III
(CONTINUED)

	Sample	(1)	(2)	(3)	(4)
		Preconflict		Preconflict, incoming/outgoing worker of same productivity tercile	
		Log (processor output)	Log (team output)	Log (unswitched processor output)	Log (team output)
HM to VM	Coethnic P			(0.007)	(0.008)
HM,C to HM,NC	Supplier			−0.243*** (0.006)	−0.038*** (0.006)
HM,NC to VM	Coethnic P			0.086*** (0.007)	
<i>N</i>		199,810	99,905	18,504	13,168
Person-position FE?		Yes	Yes	No	No
Pair FE for unswitched workers?				Yes	Yes
Date FE?		Yes	Yes	Yes	Yes
Clustering		Two-way (processor and team)	One-way (team)	One-way (unswitched pair)	One-way (unswitched pair)

(3) Production within firms (Hjort 2014)

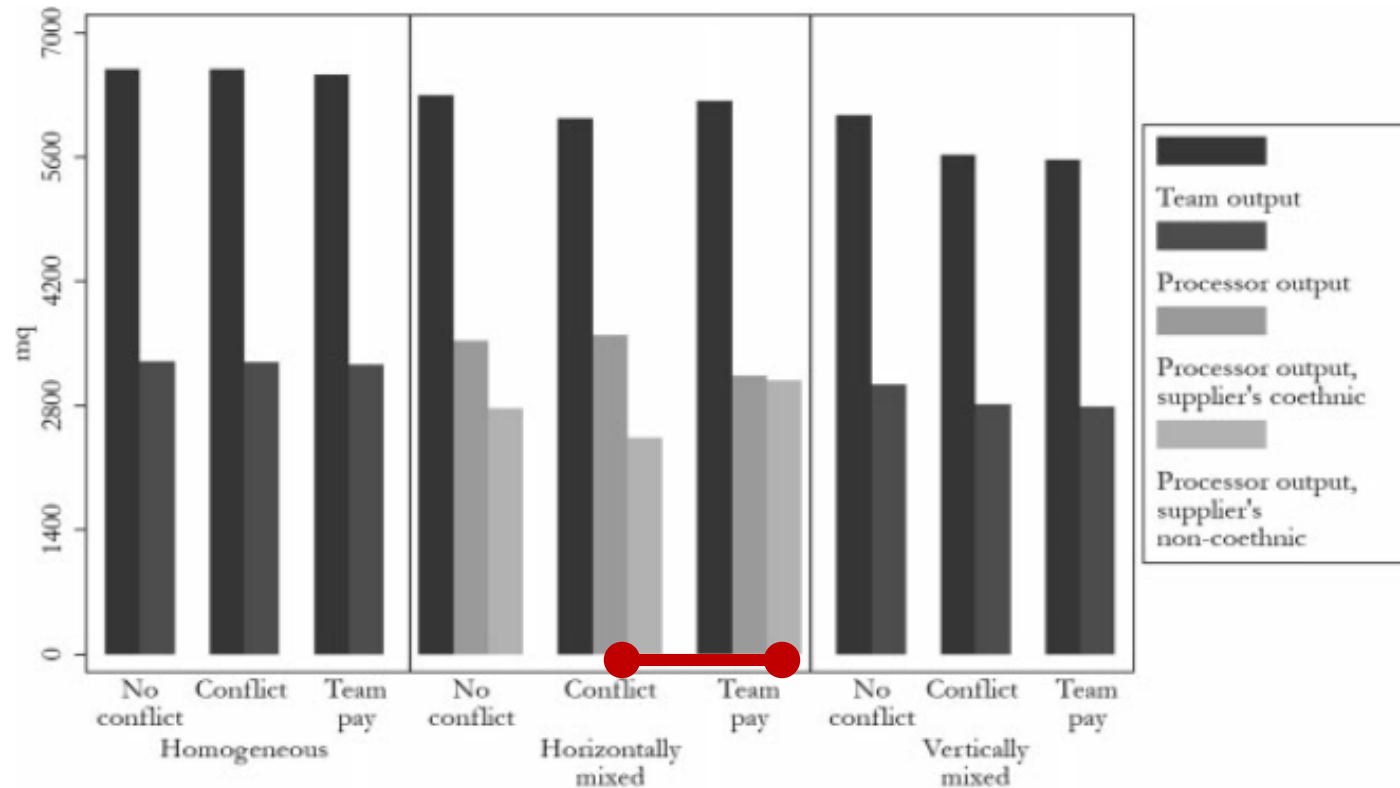


FIGURE V

Output by Team Ethnicity Configuration before and after Conflict and under Team Pay

Data from 2007 and 2008. “Conflict” signifies the first six weeks of 2008 when ethnically based violence was taking place but processors were still paid individual piece rates. “Team pay” signifies the remainder of 2008, after team pay for processors was introduced.

(3) Production within firms (Hjort 2014)

- Other interesting patterns:
- Kikuyu and Luo suppliers behave in remarkably similar ways (Figure III)
- In regression specifications including individual worker-position fixed effects, results are statistically significant
- Same holds in narrow sample of “switchers” (Table III)
- Considerable heterogeneity in the extent of supplier coethnic favoritism: females and younger workers are less likely to be biased (Table VI)

TABLE VI
HETEROGENEITY IN DISCRIMINATORY BEHAVIOR

	(1) Discrimination coefficient	(2) Discrimination coefficient
Female	-102.41*** (30.35)	-102.41*** (33.94)
Young	-145.77*** (29.77)	-145.77*** (33.29)
Percent of workdays spent in mixed teams	-41.51 (119.74)	-41.51 (133.91)
Average discrimination coefficient of non-coethnics worker was supplied by Conflict	84.10 (195.85)	84.10 (219.03) 163.25 (293.54)
Conflict \times Female		-95.74 (71.04)
Conflict \times Young		124.10* (70.46)
Conflict \times Percent of workdays spent in mixed teams		100.59 (280.49)
Conflict \times Average discrimination coefficient of non-coethnics worker was supplied by		-106.44 (467.47)
Constant	493.01*** (126.34)	493.01*** (141.29)
<i>N</i>	675	880

(3) Production within firms (Hjort 2014)

- Other interesting patterns:
- Kikuyu and Luo suppliers behave in remarkably similar ways (Figure III)
- In regression specifications including individual worker-position fixed effects, results are statistically significant
- Same holds in narrow sample of “switchers” (Table III)
- Considerable heterogeneity in the extent of supplier coethnic favoritism: females and younger workers are less likely to be biased (Table VI)
- Shows production would be higher under ethnic segregation. Why is this not implemented? (Illegal?)

(3) Production within firms (Hjort 2014)

- Hjort is concerned that these “temporary” shocks, like a few months of election violence can have persistently negative effects, since effects do not dissipate up to 9 months later

(3) Production within firms (Hjort 2014)

- Hjort is concerned that these “temporary” shocks, like a few months of election violence can have persistently negative effects, since effects do not dissipate up to 9 months later
- Yet in some related recent work in Kenya, Berge et al (2015) find little evidence of coethnic preferences in a range of economic laboratory games, among a sample of working class Nairobi residents
- Is ethnic bias highly context specific, such that rural and urban Kenyans have different ethnic preferences?
- Or, anecdotally, did the trauma of the 2007/8 violence lead Kenyan citizens, civil society and politicians to begin to “turn the page” on ethnic divisions?

Thank you!

- Many thanks to Felipe González for his assistance throughout the term
- And thanks to Elisa Cascardi for additional support for the course
- Thanks to Fred Finan for stimulating guest lectures
- Thanks to all of you for choosing to be part of the course!

Extra slides (from Burgess et al 2015, Hjort 2014)

(2) Democracy and divisions (Burgess et al 2015)

Table 4: Road Expenditure, Ethnicity and Democratic Changes in Kenya:
Political and Leadership Transitions, 1963-2011

<i>Dependent Variable</i>	Share of road development expenditure [d,t]				
		Population share [d,1962]			
<i>Leader: Regime:</i>	KENYATTA	MOI		KIBAKI	
	Democracy 1963-1969 (1)	Autocracy 1970-1978 (2)	Autocracy 1979-1992 (3)	Democracy 1993-2002 (4)	Democracy 2003-2011 (5)
Kikuyu District [d,1962]	-0.44 (0.39)	0.96** (0.39)	0.66 (0.49)	-0.88 (0.57)	0.00 (0.63)
Kalenjin District [d,1962]	-0.57 (0.41)	-0.17 (0.32)	1.88*** (0.66)	0.70 (1.11)	-0.60 (0.57)
F-test [<i>p-value</i>]	0.15	6.92**	3.13*	2.26	0.99
H ₀ : Kikuyu District = Kalenjin District	[0.70]	[0.01]	[0.08]	[0.14]	[0.33]
Observations	287	369	574	410	369
Year fixed effects	Y	Y	Y	Y	Y
District fixed effects	-	-	-	-	-

(2) Democracy and divisions (Burgess et al 2015)

Table 5: Role of the Vice-President, Cabinet Composition and Coalition Politics, 1963-2011

<i>Dependent Variable</i>	Share of road dvt. expenditure [d,t] Pop. share [d,1962]		Ethnic share of cabinet [e,t] Pop. share [e,1962]		Share of road dvt. expenditure [d,t] Pop. share [d,1962]	
	Table 1, column 4					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Coethnic District [d,t]	1.00*** (0.35)	1.39** (0.58)	0.65*** (0.17)	0.92*** (0.08)	1.39** (0.58)	1.39** (0.58)
VP-Coethnic (District [d,t] or Group [e,t])		0.54 (0.50)		0.45*** (0.13)	0.54 (0.50)	0.54 (0.50)
Panel B						
Coethnic (District [d,t] or Group [e,t])	1.72*** (0.49)	2.60*** (0.71)	0.64*** (0.13)	1.08*** (0.31)	1.71*** (0.49)	1.72*** (0.49)
Coethnic (District [d,t] or Group [e,t]) * Democracy [t]	-1.32** (0.62)	-1.63** (0.68)	0.02 (0.28)	0.03 (0.29)	-1.30** (0.64)	-1.32** (0.59)
VP-Coethnic (District [d,t] or Group [e,t])		1.46** (0.61)		0.94** (0.34)		
VP-Coethnic (District [d,t] or Group [e,t]) * Democracy [t]		-1.44** (0.61)		-0.64 (0.38)		
Kamba-Luhya-Luo District [d,1962] * Democracy [t]					0.20 (0.44)	
Non-Coethnic Majority < 80% [d,1962] * Democracy [t]						0.02 (0.67)
F-test [<i>p-value</i>]	0.90	2.49	5.87**	216.4***	0.89	1.00
H ₀ : Coethnic + (Coethnic*Democracy) = 0	[0.35]	[0.12]	[0.03]	[0.00]	[0.35]	[0.32]
F-test [<i>p-value</i>]		0.00		2.73		
H ₀ : VP-Coethnic + (VP-Coethnic*Democracy) = 0		[0.98]		[0.12]		
Observations	2009	2009	169	169	2009	2009
Year and (District or Group) fixed effects	Y	Y	Y	Y	Y	Y
Controls	Y	Y	N	N	Y	Y

(3) Production within firms (Hjort 2014)

TABLE I
SAMPLE SUMMARY STATISTICS

	Whole sample (<i>N</i> = 924)	Kikuyu (<i>N</i> = 426)	Luo (<i>N</i> = 498)
Ethnicity (% Kikuyu)	0.46 (0.50)		
Gender (% female)	0.59 (0.49)	0.57 (0.50)	0.61 (0.49)
Age (average age)	34.63 (5.21)	34.45 (5.20)	34.78 (5.21)
Experience (average years of tenure)	5.49 (1.48)	5.62 (1.40)	5.39 (1.54)
Percent of days worked, preconflict	0.90 (0.02)	0.90 (0.02)	0.90 (0.02)
Percent of days worked, conflict	0.90 (0.05)	0.90 (0.05)	0.90 (0.05)
Percent of days worked, team pay	0.90 (0.02)	0.90 (0.02)	0.90 (0.02)
Average work spell, preconflict	18.38 (1.38)	18.38 (1.42)	18.39 (1.34)
Average work spell, conflict	19.34 (2.98)	19.37 (2.98)	19.32 (2.98)
Average work spell, team pay	18.18 (1.47)	18.17 (1.45)	18.18 (1.49)

Notes. Standard deviations in parentheses. Individuals of the Kikuyu, Embu, Meru, Kamba, Maasai, and Kisii tribes are considered Kikuyu, and those of the Luo, Luhya, and Kalenjin tribes Luo.

(3) Production within firms (Hjort 2014)

TABLE II
TESTING FOR SYSTEMATIC TEAM ASSIGNMENT

		Processor 1								Total
		0,0,0	0,0,1	0,1,0	0,1,1	1,0,0	1,0,1	1,1,0	1,1,1	
S u p p l i e r	0,0,0	0.009 (0.011)	0.013 (0.011)	0.012 (0.015)	0.017 (0.017)	0.013 (0.011)	0.010 (0.010)	0.012 (0.014)	0.014 (0.012)	0.101
	0,0,1	0.010 (0.012)	0.012 (0.012)	0.017 (0.016)	0.017 (0.018)	0.012 (0.011)	0.010 (0.010)	0.017 (0.015)	0.014 (0.013)	0.108
	0,1,0	0.018 (0.017)	0.020 (0.017)	0.023 (0.023)	0.025 (0.026)	0.017 (0.016)	0.016 (0.015)	0.021 (0.022)	0.016 (0.019)	0.156
	0,1,1	0.019 (0.020)	0.020 (0.020)	0.027 (0.027)	0.029 (0.029)	0.018 (0.019)	0.017 (0.017)	0.029 (0.026)	0.020 (0.022)	0.179
	1,0,0	0.012 (0.011)	0.009 (0.011)	0.015 (0.015)	0.017 (0.016)	0.009 (0.010)	0.008 (0.009)	0.016 (0.014)	0.012 (0.012)	0.098
	1,0,1	0.010 (0.011)	0.010 (0.011)	0.015 (0.015)	0.018 (0.016)	0.009 (0.010)	0.009 (0.009)	0.014 (0.014)	0.011 (0.012)	0.097
	1,1,0	0.017 (0.015)	0.016 (0.015)	0.020 (0.021)	0.024 (0.023)	0.014 (0.015)	0.013 (0.013)	0.018 (0.020)	0.016 (0.017)	0.138
	1,1,1	0.015 (0.013)	0.011 (0.014)	0.021 (0.019)	0.019 (0.020)	0.013 (0.013)	0.012 (0.012)	0.015 (0.018)	0.017 (0.015)	0.123
	Total	0.110	0.110	0.151	0.165	0.105	0.094	0.143	0.122	
<i>p</i> -values:		Whole sample period .27		Preconflict .29		Conflict .43		Team pay .63		

(3) Production within firms (Hjort 2014)

TABLE II
(CONTINUED)

		Processor 2								Total
		0,0,0	0,0,1	0,1,0	0,1,1	1,0,0	1,0,1	1,1,0	1,1,1	
P r o c e s s o r 1	0,0,0	0.011 (0.011)	0.010 (0.011)	0.018 (0.017)	0.020 (0.019)	0.014 (0.012)	0.010 (0.010)	0.015 (0.016)	0.013 (0.014)	0.110
	0,0,1	0.011 (0.011)	0.011 (0.011)	0.018 (0.017)	0.020 (0.019)	0.011 (0.012)	0.011 (0.010)	0.016 (0.016)	0.012 (0.014)	0.110
	0,1,0	0.016 (0.015)	0.016 (0.015)	0.022 (0.023)	0.024 (0.027)	0.016 (0.017)	0.015 (0.014)	0.023 (0.021)	0.019 (0.019)	0.151
	0,1,1	0.016 (0.016)	0.017 (0.016)	0.028 (0.025)	0.028 (0.029)	0.017 (0.018)	0.012 (0.015)	0.026 (0.023)	0.020 (0.021)	0.165
	1,0,0	0.011 (0.011)	0.011 (0.011)	0.014 (0.016)	0.020 (0.019)	0.012 (0.012)	0.010 (0.010)	0.015 (0.015)	0.013 (0.013)	0.105
	1,0,1	0.010 (0.009)	0.011 (0.009)	0.016 (0.015)	0.016 (0.017)	0.008 (0.010)	0.007 (0.009)	0.012 (0.013)	0.014 (0.012)	0.094
	1,1,0	0.015 (0.014)	0.012 (0.014)	0.021 (0.022)	0.027 (0.025)	0.016 (0.016)	0.015 (0.013)	0.020 (0.020)	0.017 (0.018)	0.143
	1,1,1	0.011 (0.012)	0.013 (0.012)	0.017 (0.019)	0.021 (0.022)	0.016 (0.013)	0.011 (0.011)	0.017 (0.017)	0.017 (0.015)	0.122
	Total	0.100	0.100	0.155	0.176	0.110	0.091	0.142	0.126	
<i>p</i> -values:		Whole sample period		Preconflict		Conflict		Team pay		
		.77		.63		.56		.17		

(3) Production within firms (Hjort 2014)

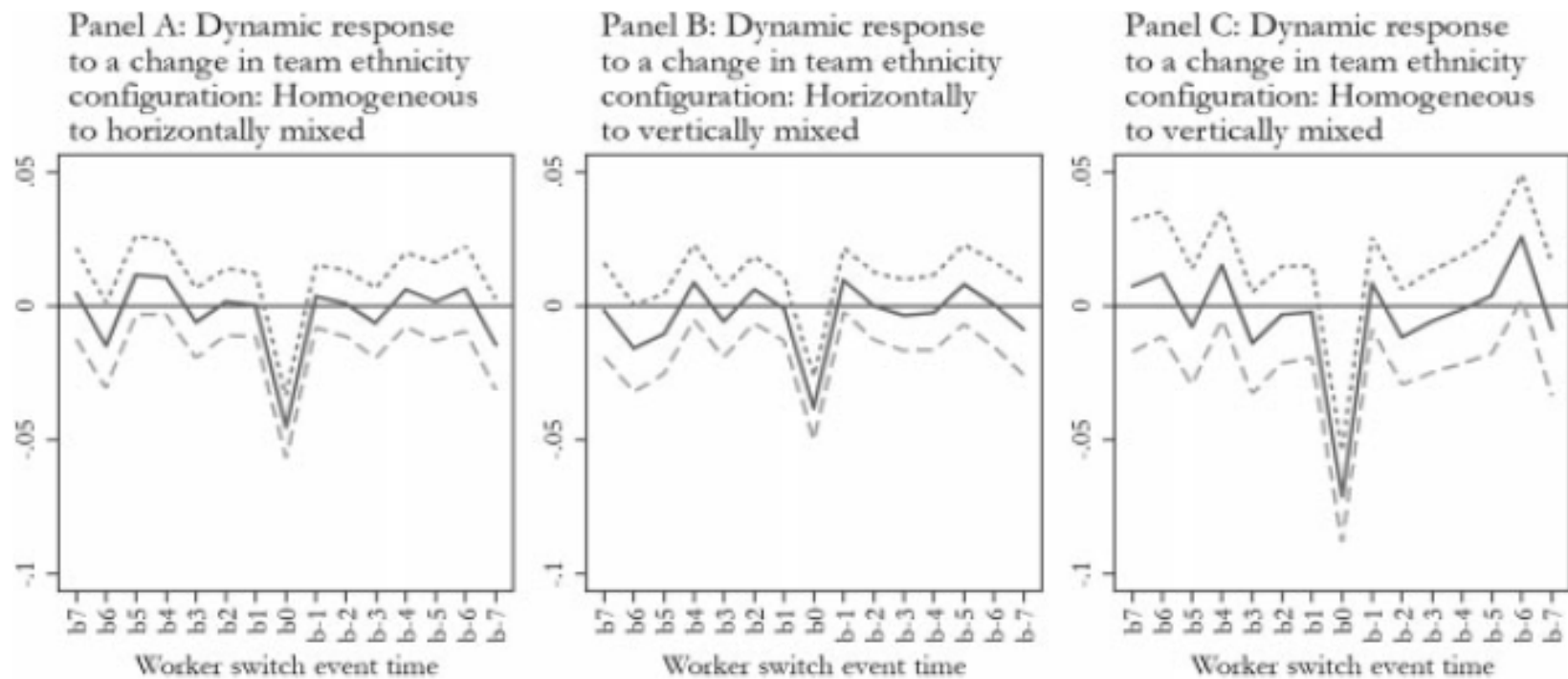


FIGURE IV

Team Output Responses to Changes in Team Ethnicity Configuration

Data from 2007. The estimated coefficients from a regression of the first difference (across days) in output on an indicator for a worker switch entailing a change in team ethnicity configuration and its lead and lag terms (the other two workers on the team are unchanged) are plotted. For example, b1 is the coefficient on the seventh lead term. The dotted lines represent 95% confidence intervals.

(3) Production within firms (Hjort 2014)

TABLE IV
OUTPUT BY TRIBE-SPECIFIC TEAM ETHNICITY CONFIGURATION

Sample	(1) Kikuyu–Luo	(2) Kikuyu–Luo	(3) Kikuyu–Luhya	(4) Kikuyu–Luhya	(5) Luo–Luhya	(6) Luo–Luhya
	Log (processor output)	Log (team output)	Log (processor output)	Log (team output)	Log (processor output)	Log (team output)
Constant	8.109*** (0.085)	8.807*** (0.085)	8.138*** (0.051)	8.837*** (0.061)	8.033*** (0.115)	8.727*** (0.111)
Horizontally mixed		−0.048*** (0.002)		−0.041*** (0.005)		−0.000 (0.006)
Horizontally mixed, processor of supplier's ethnicity	0.072*** (0.003)		0.076*** (0.006)		−0.000 (0.007)	
Horizontally mixed, processor not of supplier's ethnicity	−0.185*** (0.003)		−0.175*** (0.006)		−0.003 (0.007)	
Vertically mixed	−0.087*** (0.003)	−0.086*** (0.003)	−0.077*** (0.006)	−0.075*** (0.005)	−0.007 (0.009)	−0.006 (0.007)
<i>N</i>	72,188	36,094	34,986	17,493	16,876	8,438
Person-position FE?	Yes	Yes	Yes	Yes	Yes	Yes
Date FE?	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Two-way (processor and team)	One-way (team)	Two-way (processor and team)	One-way (team)	Two-way (processor and team)	One-way (team)

Notes. Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$. The omitted category is homogeneous teams/processor in homogeneous teams. Data from 2007 are used in these OLS regressions. The outcome variables are deseasonalized, daily output quantities. In this paper, Luo and Luhya workers are categorized as belonging to the Luo tribal bloc and Kikuyu workers to the Kikuyu bloc.

TABLE V
OUTPUT BY TEAM ETHNICITY CONFIGURATION BEFORE AND AFTER CONFLICT, AND UNDER
TEAM PAY

Sample	(1)	(2)	(3)	(4)
	Preconflict/conflict		Conflict/team pay	
	Log (processor output)	Log (team output)	Log (processor output)	Log (team output)
Constant	8.148*** (0.023)	8.840*** (0.027)	8.053*** (0.028)	8.755*** (0.030)
Horizontally mixed		-0.046*** (0.001)		-0.092*** (0.003)
Horizontally mixed, processor of supplier's ethnicity	0.070*** (0.002)		0.087*** (0.004)	
Horizontally mixed, processor not of supplier's ethnicity	-0.181*** (0.002)		-0.317*** (0.005)	
Vertically mixed	-0.084*** (0.002)	-0.084*** (0.001)	-0.163*** (0.004)	-0.161*** (0.004)
Conflict	-0.009 (0.013)	-0.010 (0.012)		
Horizontally mixed \times Conflict		-0.044*** (0.004)		
Horizontally mixed, processor of supplier's ethnicity \times Conflict	0.017*** (0.004)			
Horizontally mixed, processor not of supplier's ethnicity \times Conflict	-0.131*** (0.005)			
Vertically mixed \times Conflict	-0.074*** (0.005)	-0.073*** (0.004)		
Team pay			-0.007 (0.013)	-0.010 (0.013)
Horizontally mixed \times Team pay				0.044*** (0.004)
Horizontally mixed, processor of supplier's ethnicity \times Team pay			-0.127*** (0.005)	
Horizontally mixed, processor not of supplier's ethnicity \times Team pay			0.258*** (0.005)	
Vertically mixed \times Team pay			-0.003 (0.005)	-0.003 (0.004)
<i>N</i>	224,730	112,365	204,148	10,2074
Person-position FE?	Yes	Yes	Yes	Yes
Date FE?	Yes	Yes	Yes	Yes
Clustering	Two-way (processor and team)	One-way (team)	Two-way (processor and team)	One-way (team)

(3) Production within firms (Hjort 2014)

TABLE VII
OUTPUT GAINS FROM OPTIMAL ASSIGNMENT TO TEAMS BY ETHNICITY, PRODUCTIVITY, OR BOTH

Output-maximizing assignment by:	Ethnicity		Productivity as P and S		Ethnicity and productivity as P and S	
Preconflict						
Assignment	Homogeneous	100.00%	s3p2p3	78.62%	Homogeneous,s3p2p3	28.95%
			s2p1p3	21.38%	Homogeneous,s3p2p2	25.66%
					Homogeneous,s2p3p3	17.11%
					Homogeneous,s3p3p3	15.79%
					Homogeneous,s2p1p1	6.58%
					Homogeneous,s3p1p3	5.92%
Output gains relative to:						
observed assignment	4.41%		3.93%		9.60%	
output-minimizing assignment	8.62%		8.51%		16.47%	
Conflict period						
Assignment	Homogeneous	100.00%	s3p2p3	50.33%	Homogeneous,s3p2p3	59.54%
			s3p1p3	43.42%	Homogeneous,s2p2p2	17.11%
			s2p2p3	6.25%	Homogeneous,s2p3p3	13.16%
					Homogeneous,s3p1p3	4.93%
					Homogeneous,s2p1p1	4.61%
					Homogeneous,s2p2p3	0.33%

(3) Production within firms (Hjort 2014)

TABLE VII
(CONTINUED)

Output-maximizing assignment by:	Ethnicity		Productivity as P and S		Ethnicity and productivity as P and S	
Output gains relative to:					Horiz. mixed,s3p3p1	0.33%
observed assignment	8.20%		3.83%		15.27%	
output-minimizing assignment	17.05%		10.17%		31.76%	
Team pay period						
Assignment	Homogeneous	100.00%	s3p2p3	47.37%	Homogeneous,s3p2p2	30.92%
			s2p2p3	32.89%	Homogeneous,s3p3p3	30.26%
			s3p2p2	9.87%	Homogeneous,s3p1p3	29.61%
			s1p3p3	9.87%	Homogeneous,s2p3p3	5.26%
Output gains relative to:					Homogeneous,s2p1p2	3.95%
observed assignment	6.35%		2.96%		12.45%	
output-minimizing assignment	17.18%		9.36%		26.58%	

