Ethnic Favoritism

Robin Burgess* Rémi Jedwab†

Edward Miguel‡ Ameet Morjaria§ Gerard Padro i Miquel¶

August 2011‖

-PRELIMINARY DRAFT-

Abstract

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

Keywords: Democracy, Public Goods, Ethnic Politics, Africa
JEL classification codes: H41, H54, O12, O55, P16

*London School of Economics; r.burgess@lse.ac.uk

†Paris School of Economics; jedwab@pse.ens.fr

‡University of California, Berkeley; emiguel@econ.berkeley.edu

§Harvard Academy; ameet_morjaria@harvard.edu

¶London School of Economics; g.padro@lse.ac.uk

‖We would like to thank Tim Besley, Oriana Bandiera, Greg Fisher, James Habyarimana, Asim Khwaja, Guy Michaels, Jim Snyder, Jim Robinson, Eliana La Ferrara, Jean-Philippe Platteau, Denis Cogneau, Konrad Burchardi, Gani Aldashev and seminar audiences at LSE-EOPP, PSE, World Bank Conference on Infrastructure & Development (Toulouse), NEUDC-2010 (MIT), UK-Public Economics 2010 (Warwick), CEPR Development Economics Symposium (Stockholm), Harvard Development Lunch and Namur University for very helpful comments. This research is an output from funding by the UK Department for International Development (DFID) as part of the iiG, a research programme to study how to improve institutions for pro-poor growth in Africa and South-Asia. The views expressed are not necessarily those of DFID.

1 Introduction

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

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

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

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

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

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

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

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

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

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

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

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

2 Conceptual Framework

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

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

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

$$\begin{aligned} \eta^{Aj} &\leq \theta\eta^{Bj} \\ \eta^{Bj} &\leq \theta\eta^{Aj} \end{aligned}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1. The leader announces the policy vector $P_t = \left\{\tau^j, \eta^{Aj}, \eta^{Bj}\right\}$
2. The citizens of goup $j \in \{A, B\}$ decide whether to support the leader, $s_t = 1$ or not $s_t = 0$
3. If $s_t = 1$, P_t is implemented and payoffs are realized. Next period starts with $S_{t+1} = S_t$ with probability $\bar{\gamma}$, and the state switches with probability $1 - \bar{\gamma}$.
4. If $s_t = 0$, the leader is immediately ousted and the transition vector $P = \{0, 0, 0\}$ is implemented. With probability $\underline{\gamma}$ the new ruler belongs to the same group as the ousted ruler and hence $S_{t+1} = S_t$. With probability $1 - \underline{\gamma}$ the state switches to the other group.

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

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

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

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

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

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

Hence, the support condition reduces to:

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

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

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

subject to

$$\eta^{AA} \leq \theta\eta^{BA} \qquad (\lambda)$$

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

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

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

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

So, eliminating λ, we have

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

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

3 Historical Background and Data

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

3.1 New Data on Kenya, 1889-2011

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

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

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

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

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

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

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

3.2 Road Investments in Kenya

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

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

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

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

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

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

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

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

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

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

3.3 Ethnic Politics

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

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

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

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

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

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

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

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

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

4 Empirical Strategy and Main Results

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

4.1 Empirical Strategy

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

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

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

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

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

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

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

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

4.2 Descriptive Evidence

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

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

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

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

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

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

4.3 Results

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5 Other Results and Channels

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

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

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

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

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

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

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

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

5.1 Channels and Discussion of the Results

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

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

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

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

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

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

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

6 Conclusion

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

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

References

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

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

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

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

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

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

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

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

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

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

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

Bester, A., Conley, T. and Hansen, C. (2011). Inference with dependent data using cluster covariance estimators. *Journal of Econometrics, Forthcoming.*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Persson, T., Roland, G. and Tabellini, G. (1997). Separation of powers and political accountability. *The Quarterly Journal of Economics*, **112** (4), 1163–1202.

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

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

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

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

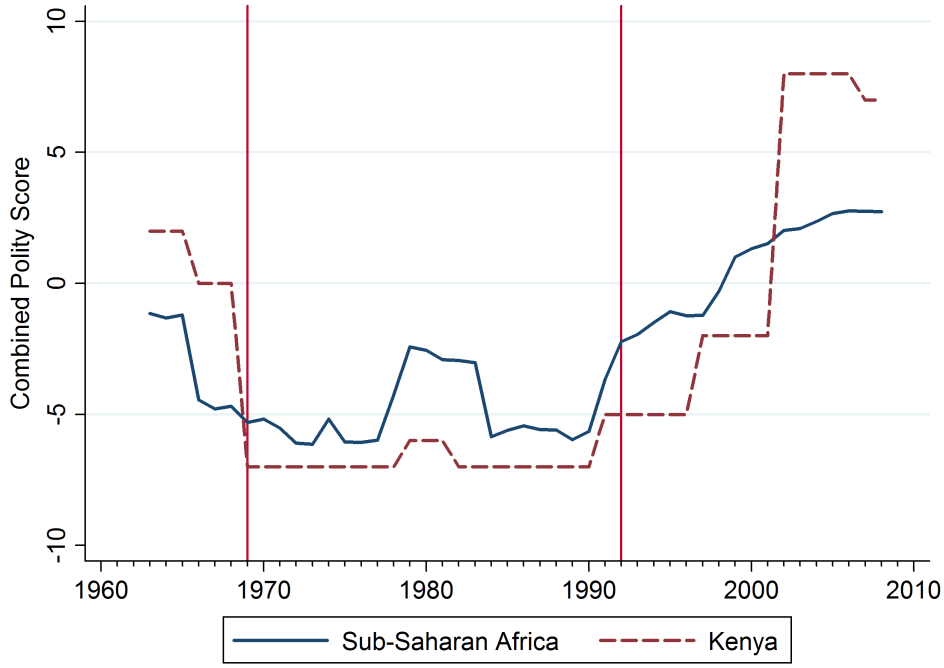
Strömberg, D. (2004). Radio's impact on public spending. *The Quarterly Journal of Economics*, **119** (1), 189–221.

Van de Walle, N. (2002). *African economies and the politics of permanent crisis, 1979-1999*. Cambridge: Cambridge University Press.

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

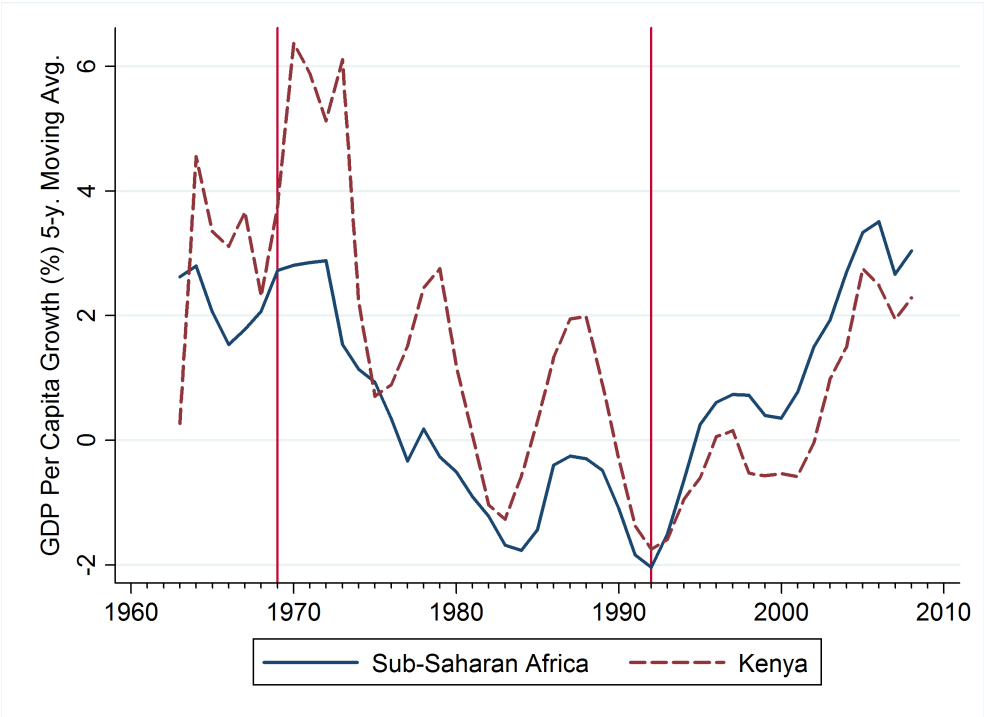
Wrong, M. (2009). *It's Our Turn to Eat: The Story of a Kenyan Whistle-Blower*. London: Fourth Estate.

Figure 1: Evolution of Political Regimes in Sub-Saharan Africa (1963-2008).



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

Figure 2: Evolution of GDP per capita growth in Sub-Saharan Africa (1963-2008).



Notes: This figure plots GDP per capita growth (%) for Sub-Saharan Africa (average) and Kenya. We take a 5-year moving average to smooth fluctuations. The vertical lines represent regime changes in Kenya: 1969 is the transition from multi-party democracy to single-party autocracy, while 1992 is the return of multi-party democracy. See Data Appendix for data sources.

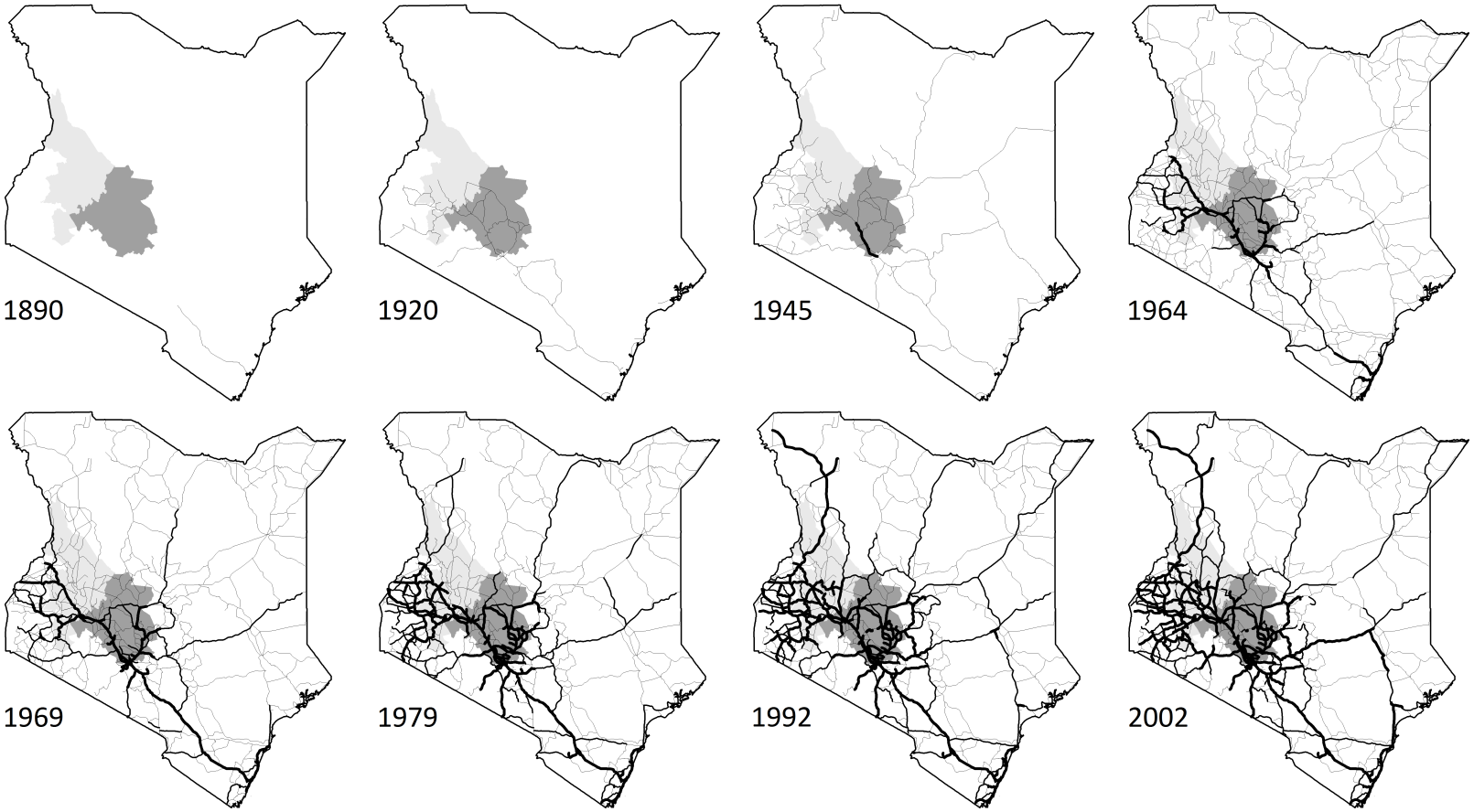
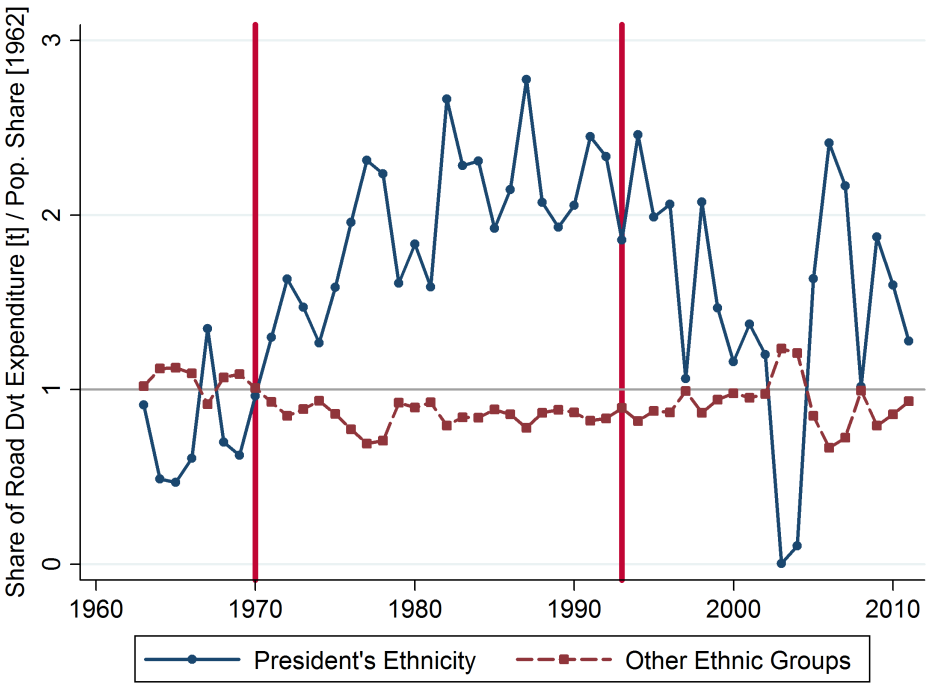


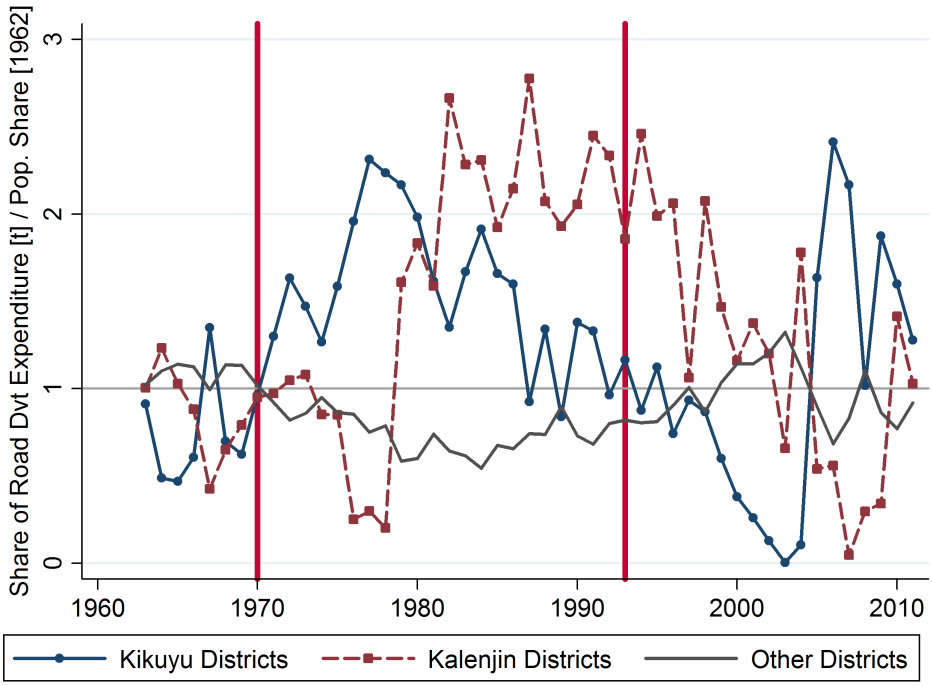
Figure 3: Evolution of Kenya's Road Network for Selected Years (1890-2002)
Paved (Thick Black), Improved (Black) and Dirt (Grey) Roads, and Kikuyu (Grey) and Kalenjin (Light Grey) Areas.

Figure 4: Road Investments and Presidential Districts (1963-2011).



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

Figure 5: Road Investments and Presidential Ethnic Groups (1963-2011).



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

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

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

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

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

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

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

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

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

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

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

Dep. Variable: Share of road development expenditure [d,t] / Population share [d,1962]					
	(1)	(2)	(3)	(4)	(5)
Presidential District Dummy [d,t]	1.74***		2.10***	1.60***	2.34***
	(0.49)		(0.77)	(0.50)	(0.58)
Presidential District Dummy [d,t]	-1.32**		-1.73*	-1.13	-1.45**
x Multi-Party Dummy [t]	(0.63)		(0.86)	(0.69)	(0.64)
Presidential Share [d,t]		2.30***			
		(0.56)			
Presidential Share [d,t]		-1.90***			
x Multi-Party Dummy [t]		(0.66)			
Presidential District Dummy [d,t] x White Highlands [d]			-0.74		
			(0.90)		
Presidential District Dummy [d,t] x White Highlands [d]			0.8		
x Multi-Party Dummy [t]			(1.07)		
President District of Birth [d,t]				0.9	
				(1.22)	
President District of Birth [d,t]				-1.3	
x Multi-Party Dummy [t]				(1.05)	
Second Cabinet Group [d,t]					1.71***
					(0.55)
Second Cabinet Group [d,t]					-1.92**
x Multi-Party Dummy [t]					(0.82)
Observations	2009	2009	2009	2009	2009
Adj. R-squared	0.12	0.12	0.12	0.12	0.13
District and year fixed effects	Y	Y	Y	Y	Y
(population, area, urbanization rate)*year	Y	Y	Y	Y	Y
(earnings, employment, cash crops)*year	Y	Y	Y	Y	Y
(main highway, border, dist.Nairobi)*year	Y	Y	Y	Y	Y
District time trends	N	N	N	N	N
No. of districts	41	41	41	41	41
F-test [*p-value*]	0.90	0.97	1.53	0.90	4.06*
President + President * Multi-Party = 0	*[0.35]*	*[0.33]*	*[0.22]*	*[0.35]*	*[0.05]*

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

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

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

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

Appendices

A Data Appendix

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ethnic Census Data:

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

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

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

[11] Tables not shown but available upon request.

[12] There are 168 locations.

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

Political Economy:

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

Control Variables:

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

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

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

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

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

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

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

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

Macroeconomic and Democracy Data:

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

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

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

References

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

Anderson, K., and E. Valenzuela (2008): *Estimates of Global Distortions to Agricultural Incentives, 1955 to 2007*. Washington DC: World Bank.

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

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

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

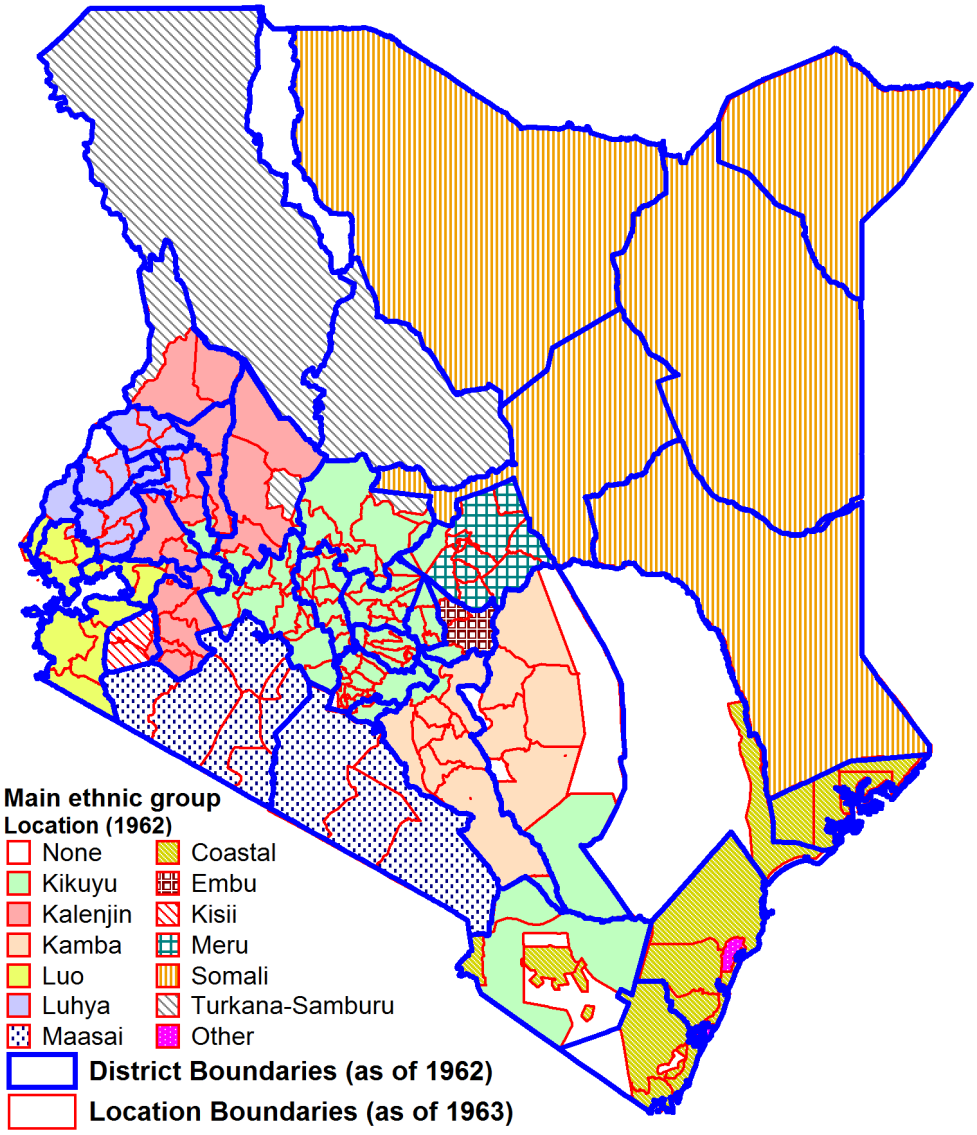
IMF (2011): *International Financial Statistics*. Washington D.C.: International Monetary Fund.

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

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

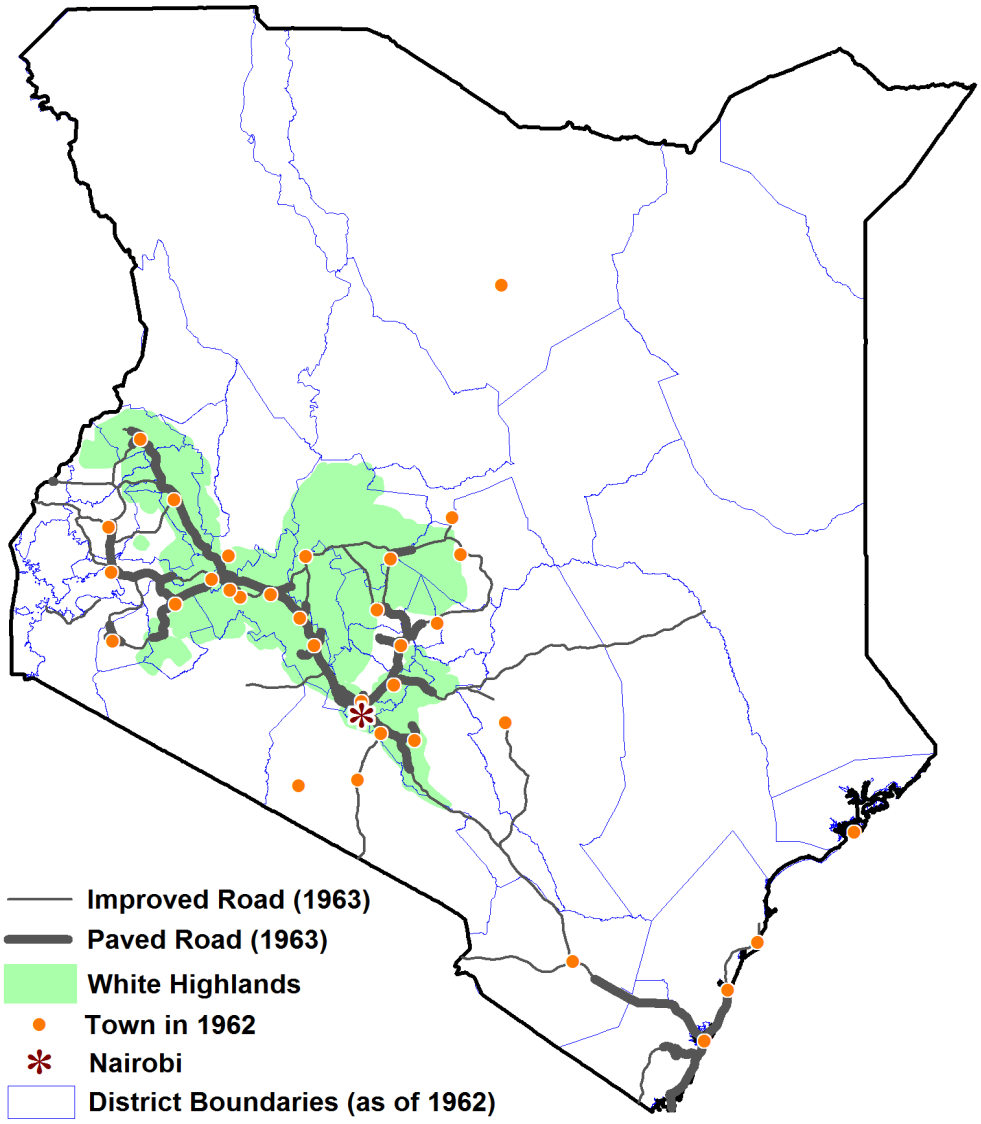
WB (2011): *Word Development Indicators*. Washington D.C.: World Bank.

Appendix A Figure 1: Ethnic Groups and Administrative Boundaries.



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

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



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

Appendix A Table 1: Sample Descriptives

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

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

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

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

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

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

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

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

B Mathematical Proof

Algebra: is η^{BA} decreasing in θ?

$$
\begin{aligned}
\eta^{BA} &= \frac{\eta^{AA}}{\theta} \\
R'(\eta^{AA}) - \pi - \frac{1-\pi}{\theta} &= 0 \\
\frac{\partial \eta^{AA}}{\partial \theta} &= -\frac{\frac{1-\pi}{2\theta^{\frac{1}{2}}}}{R''(\eta^{AA})} > 0 \\
\frac{d\eta^{BA}}{d\theta} &= \frac{\partial \eta^{AA}}{\partial \theta}\frac{1}{\theta} - \frac{\eta^{AA}}{2\theta^{\frac{1}{2}}} = -\frac{\frac{1-\pi}{2\theta^{\frac{1}{2}}}}{R''(\eta^{AA})}\frac{1}{\theta} - \frac{\eta^{AA}}{2\theta^{\frac{1}{2}}} \\
& \frac{1}{2\theta^{\frac{1}{2}}}\left[\frac{1-\pi}{-\theta R''(\eta^{AA})} - \eta^{AA}\right] \\
& \frac{1}{2\theta^{\frac{1}{2}}}\left[\frac{R'(\eta^{AA})-\pi}{-R''(\eta^{AA})} - \eta^{AA}\right] \\
& \frac{1}{2\theta^{\frac{1}{2}}}\left[\frac{R'(\eta^{AA})-\pi+\eta^{AA}R''(\eta^{AA})}{-R''(\eta^{AA})}\right]
\end{aligned}
$$

So for monotonically decreasing we need

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

which will not be true for R almost linear.

C Additional Results

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

C.1 Robustness checks

C.1.1 Improved Road Construction

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

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

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

C.1.3 Regression To The Mean

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

[1] Results not shown but available upon request.

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

C.1.4 Spatial Dependence

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

C.1.5 Tax Discrimination

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

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

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

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

C.2 Additional Results using Road Expenditure Data

C.2.1 Vice-President/Prime Minister Effects

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

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

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

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

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

C.2.2 Additional Second Group Effects

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

C.2.3 Cabinet Share Effects

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

C.2.4 Road and Public Works Minister's Effects

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

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

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

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

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

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

C.3 Additional Results using Cabinet Data

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

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

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

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

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

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

References

Bester, A., T. Conley, and C. Hansen (2011): "Inference with Dependent Data Using Cluster Covariance Estimators," *Journal of Econometrics, Forthcoming.*

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

Appendix C Table 1: Additional Robustness Checks (1)

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

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

Appendix C Table 2: Additional Robustness Checks (2)

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

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

Appendix C Table 3: Explaining Cabinet Ethnic Share

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

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

One Mandarin Benefits the Whole Clan: Hometown Favoritism in an Authoritarian Regime*

Quoc-Anh Do[†]
Sciences Po

Kieu-Trang Nguyen[‡]
London School of Economics and Political Science

Anh N. Tran[§]
Indiana University Bloomington

January 2013

Abstract

Although patronage politics in democracies has been studied extensively, it is less understood in undemocratic regimes, where a large proportion of the world's population resides. To fill this gap, our paper studies how government officials in authoritarian Vietnam direct public resources toward their hometowns. We manually collect an exhaustive panel dataset of political promotions of officials from 2000 to 2010 and estimate their impact on public infrastructure in their rural hometowns. We obtain three main results. First, promotions of officials improve a wide range of infrastructure in their hometowns, including roads, markets, schools, radio stations, clean water and irrigation. This favoritism is pervasive among officials across different ranks, even among those without budget authority, suggesting informal channels of influence. Second, in contrast to pork-barrel politics in democratic parliaments, elected legislators have no power to exercise favoritism. Third, only home communes receive favors, while larger and more politically important home districts do not. This suggests that favoritism is likely motivated by officials' social preferences for their hometowns rather than by political considerations.

Keywords: favoritism, patronage, authoritarian regime, political connection, hometown, infrastructure, cultural preference, directed altruism.

JEL Classifications: O12, H54, H72, D72, D64

---

* We thank Robin Burgess, Frederico Finan, Matthew O. Jackson, Ben Olken, Eddy Malesky, Kosali Simon, seminar participants at Indiana University and Singapore Management University, conference participants at the NEUDC 2011 at Yale University and the ALEA meeting 2012 at Stanford University, as well as other colleagues for thoughtful suggestions. Remaining errors are our own.
† Sciences Po, Department of Economics and LIEPP, Paris, France. Email: quocanh.do@sciences-po.org.
‡ London School of Economics and Political Science. Email: nguyenk@lse.ac.uk.
§ Indiana University Bloomington. Email: trananh@indiana.edu.

"One person becomes a mandarin,[1] *his whole clan benefits."*
- Vietnamese proverb

"Even the blind favor the people they know."
- Indian proverb

"When a man gains power, his chicken and dogs all go to heaven."
- Chinese proverb

1. Introduction

Studies of corruption, defined as officials' and bureaucrats' abuse of the privileges of public office for private gain, often consider such gains in terms of personal and family benefits. In other cases, the misuse of public office is manifest as favoritism towards certain associated groups. In democracies where there is electoral accountability for office holders, favoritism has often been studied in the form of pork-barrel politics, whereby politicians and officials direct resources to favor certain groups in order to win their votes and political support. This strategic quid-pro-quo behavior has been a central topic in the political economic literature, and is substantiated by a significant body of evidence (e.g. Ferejohn 1974, Shepsle and Weingast 1981).

However, in authoritarian regimes where the state is barely accountable to voters, politicians gain power not via competitive elections. To get appointed to an office, they have an incentive to please their superiors rather than any group of citizens. This lack of electoral incentives opens up a number of questions regarding the political economy of autocracies. For example, do officials favor any group of citizens at all? Which parts of the political hierarchy can direct public resources towards favored groups, given that authority is highly concentrated in the hands of a few people at the top? How is such favoritism actually exercised? What are the motives of such favoritism when

[1] The term "mandarin" refers to the historical scholar-bureaucrats of the Vietnamese monarchist court.

elections do not matter? Favoritism's motives, whether political or cultural, have important implications for the design of anti-corruption institutions.

Our paper addresses these questions by examining the effects of public officials' political promotions on public infrastructure in their hometowns in single-party Vietnam. The term "hometown" refers to each official's commune of patrilineal origin, a denomination that is important culturally but has little political significance. We collect an extensive dataset of political promotions, match them with infrastructure data from the Vietnam Household Living Standard Surveys and employ a fixed-effect model to identify the magnitude of this effect. We refer to it as *favoritism*, as this is a form of favors given by officials to their remote relatives regardless of merit.

This authoritarian context also allows us to analyze the motives of favoritism, which further distinguishes our considerations from the existing literature on pork barrels in democracies. Most studies since Ferejohn's (1974) seminal work explain patronage politics in terms of political strategies to distribute pork in exchange for votes and campaign contributions. Notable empirical evidence includes Ray (1981), Levitt and Snyder (1995) and Rundquist and Carsey (2002) in the U.S; Kopecký and Scherlis (2008) in Europe; Chattopadhyay and Duflo (2004), Banerjee and Somanathan (2007), Gajwani and Zhang (2008) and Keefer (2010) in India and Kaja and Werker (2010) in the context of international organizations. Schady (2000), Stokes (2005), Magaloni (2006), Keefer and Khemani (2009) and Golden and Tiwari (2009) provide further evidence for this political exchange by showing that pork is often targeted at swing voters. In addition, Levitsky (2007) and Lindberg and Morrison (2008) find that pork increases as elections become more competitive. Besley, Pande and Rao (2012) show that elected officials favor their own villages and castes, which in turn support them in elections.[2]

[2] Favoritism also relates to the burgeoning literature on the value of political connection through socio-economic relations, such as Khwaja and Mian (2005), Goldman et al. (2009) and Do et al. (2011).

Electoral motives need not be the only explanation for favoritism. Political leaders may favor certain groups for non-vote political support. At crucial times, political support from politically active groups can help influence public opinion, mobilize mass protests or mitigate political conflict. Politicians may also distribute favors to certain groups due to their ideological beliefs or personal preferences. In democratic countries, it is difficult to study those motives separately, because of their coexistence in most situations. Studying favoritism in an authoritarian context, where votes do not matter, allows us to better distinguish between motives.

In authoritarian regimes, anecdotal examples abound of the excessive favors that dictators bestow on their hometowns. Sirte was a small and unknown village in Libya until the early 1970s when it suddenly received the massive government investments that turned it into a proper city. In 1988, the Libyan parliament and most government departments were even relocated from Tripoli to Sirte. This special treatment was a surprise to no one: the town is the birthplace of Colonel Gaddafi, Libya's autocrat from 1969 until recently. In a similar vein, Félix Houphouët-Boigny, the dictatorial president of the Côte d'Ivoire from 1960 until his death in 1993, moved the official capital city from Abidjan to the ten-times smaller town of Yamoussoukro in 1983, his birthplace. The new capital received massive public investments, including the completion in 1989 of the $300-million Basilica of Our Lady of Peace of Yamoussoukro, constructed on an area even larger than St. Peter's Basilica in Vatican City.

Beyond anecdotes such as these, favoritism in authoritarian regimes has been shown most systematically as ethnic favoritism. Recent studies by Burgess et al. (2011) and Kramon and Posner (2012) provide empirical evidence of favoritism towards common ethnic groups by top autocrats in Kenya. Under nondemocratic institutions, Kenyan presidents directed public resources disproportionately towards their ethnic groups to build roads (Burgess et al 2011) and improve education (Kramon and Posner 2012). When the country became more democratic, road

construction favoritism disappeared, while education favoritism remained equally prevalent. In a similar vein, Franck and Rainer (2012) find that authoritarianism aggravates ethnic favoritism. In other studies suggestive of favoritism in autocracies, Persson and Zhuravskaya (2009) report more public good provision in Chinese provinces when provincial leaders build their careers within the province, and Markussen and Tarp (2011) show that land improvement investments in Vietnam increase for households that self-report their connections to officials.

The literature thus far does not distinguish whether autocrats favor their connected groups for non-vote political support in the case of violent conflicts (as suggested by Padro-i-Miquel 2007 and Burgess et al 2011) or due to personal preferences. The question is: is favoritism rooted in autocrats' evaluations of their political survival, or in their intrinsic utility function? During the recent revolution in Libya, Sirte's role as the last line of defense for Colonel Gaddafi demonstrates that the former motive can be as important as the latter. These two motives are often entangled, especially when top leaders in authoritarian regimes grant favors to a sizeable group with strong political potential, such as entire ethnic groups or large provinces.

To separate the social-preference motive from the non-vote political support motive, we can employ two empirical strategies. First, we can analyze favors bestowed on politically insignificant groups who are not able to mobilize significant non-vote support for an official in an authoritarian regime. Second, we can look for favoritism exercised by lower-level officials whose political promotions depend solely on their superiors' decisions and whose political survival has no relation to the recipients of favors (say, as supporters in an armed conflict.) The combination of both strategies would best highlight the social-preference motive. This approach requires an extensive dataset covering a wide range of officials, detailed allocation of public resources to small groups and a reliable measure of connection between officials and beneficiaries.

Vietnam provides a unique opportunity for that purpose. A single party, the Communist Party of Vietnam (CPV), has ruled the country since its unification in 1975. The ruling party selects, controls and appoints positions in practically all political, executive and legislative bodies, including its powerful leadership in the Politburo and its Central Committee, as well as the government and 80% of the National Assembly. The judiciary branch is weak, and the People's Supreme Court's Chief Justice is considered a member of the cabinet. In the selection process for political and executive bodies, decision power lies mostly with the Politburo and the CPV's Central Committee, while popular support barely plays any role. While the National Assembly is elected by popular vote, the candidate selection process is under tight scrutiny by the CPV, and the election is in truth more of a non-binding approval vote on the government (Malesky and Schuler 2009). In this context, government officials are mostly accountable to the selectorate within the Party and are insulated from the population.

The commune is lowest administrative level in Vietnam. There are more than eleven thousand communes in the country, and each is home to only a few thousand people on average. Given their tiny size, no single commune can harness any significant level of political or popular support for a ranking official in provincial or national government. Because communes play no role in the political selection process, existing theories of clientelism would not predict politically motivated favoritism on the part of officials. Therefore, the Vietnamese context of officials' home communes provides an ideal setting for eliminating concerns about strategic political behavior, leading to an the interpretation of favor as rooted in social preferences.

Infrastructure is a particularly important area of public spending that deserves examination. Research suggests that a 10% increase in infrastructure investment increases regional income by 1 to 1.5% in the long run (Shioji 2001). In developing countries, it has been estimated that about 30% of economic growth is attributed to infrastructure improvement (Calderon et al 2011). In poorer

countries such as in Africa, infrastructure can contribute to more than half of total growth (Kingombe 2011). The United Nations regards infrastructure as one of the most important foundations for achieving its Millennium Development Goals. However, building and maintaining this foundation for development is also expensive. Africa can only invest about 5% of its income in infrastructure. Fast-growing Vietnam and China, on the other hand, invest nearly 10% of their national incomes in this critical foundation (Sahoo 2012).

In Vietnamese culture, a hometown, defined as the patrilineal town of origin, is a significant part of each person's identity, as it represents the traditional geographical root of a person's patriarchal family. A hometown accounts for a person's patrilineage, in many cases up to hundreds of years in genealogical records. Bonds can exist among relatives from the same hometown even if they are genealogically four or five generations remote from one another. On the other hand, hometowns play no significant political role in a politician's career. A politician's family might have already moved away before he was born,[3] or at some point during wartime prior to 1975. If not, the politician still must have moved away as soon as he ascended to any position at the provincial level or higher, since we only consider hometowns in rural area. Therefore, any affiliation between officials and hometowns originates mostly from Vietnamese cultural and social norms. Such norms are captured by the old saying, "one person becomes a mandarin, his whole clan benefits."

Such favoritism is usually the fruit of combined efforts on the part of both officials and local officers. Typically, a commune leader from a newly promoted official's hometown starts the process by suggesting to the official certain projects from which the hometown could benefit, usually in the form of infrastructure construction. In most cases, these projects are not at all under the official's authority. Nevertheless, the official can use his political capital to intervene in decisions on the commune's budget and project funding, possibly by making deals with appropriate authorities, and

[3] Purely for expositional convenience, we refer to ranking officials as males.

eventually get the project for his hometown. Due to the large amount of public investment in infrastructure at all levels during the last decade, this mechanism of giving and obtaining favors for hometowns has become rampant.

In this empirical project, we first collect data on all officials in ranking office during the period 2000-2010. Ranking officials include all members of the Party Central Committee, all government positions of the deputy minister rank and above, all provincial leaders and all members of the legislative National Assembly. We then match their hometowns to infrastructure data on communes, the lowest official administrative unit, as surveyed by the Vietnam Household Living Standards Survey (VHLSS, a World Bank-led survey project in Vietnam and part of the World Bank's Living Standards Measurement Surveys).

To estimate the effect of officials' promotions on infrastructure in their hometowns, we need to address a key challenge: political promotions of officials can be endogenous. In particular, powerful provinces may have better infrastructure and at the same time they can get more promotions for their officials in the Central Government. To deal with this and other endogeneities, we employ a fixed-effect strategy, which includes commune-official pair-fixed effects and year dummies to eliminate time-invariant omitted variables. Further, we run placebo tests for the effect of officials' promotions on communes neighboring their hometowns to ensure that there is no evidence for time-variant omitted variables and reverse causation.

Using this strategy, we find strong evidence of favors addressed to officials' hometowns across several types of infrastructure, most notably road access to villages and marketplace construction. Promotions also increase the chances that a commune will benefit from the State's support for poor communes, through a program supposed to select communes purely based on their level of hardship.

The distribution of this favoritism reveals the power structure within an authoritarian regime, a topic often considered a black box to outsiders. Contrary to pork-barrel politics in democracies, we find that members of the legislative National Assembly do not have much influence on their hometowns' budget, despite their formal budgetary authority. On the other hand, favoritism is pervasive among executive officials, who do not have formal budgetary authority. The effect is stronger when the age of the hometown's commune chair is closer to the official's age, and where the provincial institutional environment allows for more discretionary policies. These findings suggest that favoritism works through informal channels based on specific forms of political power and institutional settings.

Given the top-down nature of political promotions, officials arguably do not help their communes in exchange for political support. In our analysis, favoritism is detected only for home communes and not for larger home districts, while even the latter is still too small a geographical unit to provide any significant political support. This pattern suggests that the main motive of favoritism is a form of social preference directed towards each official's hometown.

This finding also provides real-world evidence of *directed altruism* that goes beyond controlled experiments using dictator games (Leider et al 2009, drawing from Williams's (1966) and Dawkins's (1976) ideas on the selfish gene.) It suggests that officials find intrinsic utility in providing additional consumption and wealth to a group of social relatives defined by common or proximate social characteristics, e.g. those coming from the same greater family or the same clan; sharing the same caste, race, gender or religion; originating from the same geographical region or having similar social and class status.

The paper is organized as follows. Sections 2 to 6 present the political background of Vietnam and the conceptual framework, data description, methodology and empirical results, respectively. The last section discusses the results and concludes.

2. Context of the Study

2.1 Political background

The Constitution of the Socialist Republic of Vietnam states that, "the Communist Party of Vietnam… is the leading force of the State and the Society." In practice, the Communist Party of Vietnam (CPV) has held a monopoly of power since Vietnam's reunification in 1976. CPV members account for less than 4% of the population. In the Vietnamese political structure, the three most important bodies (by the order of actual power) are the CPV, the Government, and the National Assembly. The CPV is headed by a General Secretary, and its leadership includes a 15-member Politburo and a 150-member Central Committee. These are the most powerful people and decision-making entities in Vietnam; they are in charge of making key personnel and strategic decisions for the country.

The Government, headed by a Prime Minister and several Deputy Prime Ministers, is the executive branch of the state. Functionally, the Government consists of more than 30 ministries and ministry-level agencies. The cabinet includes the State Bank's Governor, the Chief Justice of the Supreme People's Court and the Prosecutor General of the Supreme People's Procuracy.[4] Geographically, the Government includes 64 provincial authorities called Provincial People's Committees. Local authorities are considered branches of the Central Government. There are three levels of the local authorities: provincial, district and commune. The lower-level People's Committees report to the higher-level People's Committees.

The National Assembly is the legislative branch of the state. It consists of roughly 500 delegates elected from electoral districts based in the 64 provinces. The CPV closely controls the nomination and election process for the National Assembly (Malesky and Schuler 2009). About 80% of the delegates are members of the CPV. Although the de facto power of the National Assembly

[4] The judiciary in Vietnam has limited power and depends heavily on the Government and CPV.

has been expanded in recent years, it is very limited compared to that of the CPV and the Government. All laws and budget decisions are prepared by the Government before they are sent to the National Assembly for discussion and ratification.

As in other authoritarian regimes, the ruling party selects, appoints, and influences the filling of all government and political positions, including those in the three bodies discussed above. The nominal process is supposed to work as follows. In election years CPV members meet in the Party Congress and select the Central Committee, which then selects the Politburo and ranking positions based on lists of candidates recommended by the incumbent Politburo and Central Committee. The CPV then nominates candidates for the National Assembly, including ranking positions in the National Assembly, and citizens vote among these candidates. After that, elected delegates of the National Assembly, 80% of whom are CPV members, vote to approve the Prime Minister and Cabinet Members nominated by the CPV in a single, uncontested list. Finally, the Prime Minister and Cabinet Members appoint all other positions in the Government. In practice, the CPV closely controls the selection of candidates, the communication between candidates and constituents, the election locations and procedure, and the counting of the votes. The CPV's Central Committee effectively decides who fills ranking positions in the Central and Provincial Governments and in the National Assembly. Malesky and Schuler (2009) document the CPV's controlling practices in elections in Vietnam.

Under Vietnam's single-party rule, there is little separation between the State and the CPV, and thus little distinction between politicians and bureaucrats. In practice, starting from very low ranks, such as the heads of communes, officials in the Government need to be members of the CPV jn order to hold office and get promotions. The career ladder in the Government starts from the entry level and ends at the highest level of Prime Minister without a threshold that distinguishes

bureaucrats from politicians. Ranking members of the CPV and elected delegates of the National Assembly receive their salaries from the same system and source as do government bureaucrats.

For this study, it is also useful to understand the ways in which Vietnamese government officials may direct public investments in infrastructure toward their preferred communes. Subject to the level of funding required, the decision to build a commune road, school, clinic, kindergarten or market is usually made in different stages by provincial, district and then commune officials. These are the officials who can directly favor projects for certain communes. Officials at the central level, such as members of the Central Committee of the CPV, of the Government Cabinet or of the National Assembly, usually do not have the formal, hierarchical authority to make decisions on local infrastructure. They must exercise their personal influence on local officials, who have the authority in this matter, in order to obtain government projects for their preferred communes. The only exception to this is Program 135, the State's "poor commune support program" which aims to promote the development of especially difficult communes by, among other things, investing in commune infrastructure. The selection of "'especially difficult communes"' is made by the Central Government under the advice of a joint committee of several related ministries.

During the study period, Vietnam experienced significant economic growth accompanied by a drastic reduction in poverty. GDP in real terms increased 6.5% per year on average from 2001 to 2010. The percentage of people living on less than two dollars (PPP) per day fell from 68.7% in 2002 to 38.5% in 2008.[5] The government's budget, while always in deficit, was strongly supported by the growing economy, strong exports (particularly the increasing world prices of exported crude oil) and development aids. Consequently, the government expanded all forms of infrastructure construction, including in particular those in communes and districts, an attempt widely seen as a

[5] World Bank, World Data Bank, accessed August 8, 2011

key way of alleviating poverty in the country. This period therefore held particular interest for a study of the determinants of infrastructure improvements in rural Vietnam.

2.2 Cultural and social background

Culture is known as an important informal institution that sanctions political and economic behaviors (Helmke and Levitsky 2003, Tabellini 2010). The phenomenon of strong connections among extended families is a cultural norm not unique to Vietnam. The importance of kinship networks in both traditional and post-traditional societies has been long studied inter alia by Radcliffe-Brown (1922), Gluckman (1955) and Mitchell (1965). The diverse ways in which these networks exhibit and operate across different societies have attracted more recent studies. For example, Angelucci et al. (2007, 2012) have stressed the importance to informal insurance of social networks based on the extended family in rural Mexico. The literature on social networks also identifies family links as a key factor in job searches (see Ioannides and Loury's 2004 review).

In our context, the family links manifest in the form of connections to a hometown are a strong point of reference in Vietnamese culture. The Vietnamese population is relatively homogenous. The Kinh (original Vietnamese) account for 86% of the population,[6] and they also control most important political positions. In their traditionally heavily patriarchal society, which is rooted in a long history of Confucian influences and a cult of ancestral worship, Vietnamese social norms put particular emphasis on patrilineal links in the family and society (Hunt 2002). Since Confucius, filial virtues, mostly defined within a patriarchal family, have been considered the building blocks of a stable society. Therefore, all links based on common patriarchal roots are sacred and command great respect. It is quite common to observe large loans and transfers within the extended patrilineal family, and especially contributions towards "public goods" such as religious

[6] Authors' calculation from 2009 Population Census's data.

ceremonies and ancestral temples that help glorify common patrilineal ancestors. Those norms also explain the strong preference for sons as opposed to daughters in Vietnamese society.

Therefore, one's hometown, defined as the origin of a person's patrilineal clan, is truly important to most Vietnamese. It highlights a person's connection to his or her extended patrilineal family, composed of all those who share one's patrilineal ancestors (Nguyen and Healy 2006). Bonds are easily forged among people of common hometown even if they are genealogically many generations remote from each other. Hometowns are so important that this information figures in all Vietnamese national identity cards, while there is no information on place of birth.

Under traditional Vietnamese Confucian culture, government officials resemble the successful mandarins of the old days. Historically, the selection, promotion and ascent to power of mandarins were heralded with major celebrations in their hometowns. Once selected, mandarins would usually try to direct favors to their hometowns in acknowledgment of the benevolent blessings they must have received from their ancestors, and in sustaining the tradition of filial virtues. Anecdotal evidence points out that these practices are still very common today.

The Vietnamese context thus opens the door to our study of the role of officials' social preferences towards their hometowns. The connections between individuals and their hometowns are prevalent and important according to the existing social norms. They are also distinct from political motivations, since hometowns are of negligible political importance. Moreover, because of the long wars in Vietnam, most current key officials must have either been born far away from their hometown, or have moved away at a young age as part of waves of war refugee migrants in both the North and the South; they also must be at present based in a large city away from their rural hometowns. Therefore, officials' links with their hometowns are mostly based on cultural and social factors.

3. A simple conceptual framework

Existing economic theory has analyzed favoritism in auctions (Laffont and Tirole 1989, Burguet and Perry 2007, Lee 2008, Arozamenaa and Weinschelbaumb 2011), in the labor market (Prendergast Topel 1996, Miguel A. Duran and Morales 2011) and in queuing for public resources (Batabyal and Beladi 2008). Ethnicity (Burgess et al 2011), gender (Abrevaya and Hamermesh 2012) and social pressure (Garicano, Palacios and Prendergast 2005) have been considered as bases for favoritism. In this section, we present a simple model to illustrate how hometown-based favoritism works, and predict how officials' power and motives shape the outcomes of this type of favoritism.

The model involves a sequential game between two utility-maximizing agents, the Official and the Budget Allocator.[7] The Official corresponds to newly promoted officials with special links to their place of origin. The Allocator refers to the government unit that has authority over budget allocations to communes. The Official cares about getting additional resource allocation for his commune, which often comes in the form of additional budget infrastructure projects such as roads, markets, schools and clinics. These additional resources can benefit the Official in two ways: by providing him with additional political support from his home commune/district, as observed in the case of pork-barrel politics, and by appealing to his "altruistic" preference to improve the welfare of his commune/district of origin and his remote relatives living there. This altruistic preference is understood as an inherent cultural trait. Let λ denote the administrative level of the place of birth. λ can be commune, district or province. A higher λ means a larger administrative level, with more potential to provide political support but less social affection from the Official. The model allows for the comparison of different λ's (commune versus district) to gain insight into the Official's motivation.

[7] For expositional convenience, we refer to the official as male and the local authority as female.

To achieve his objective, the Official has to work out a deal with the Allocator, who has direct control over budget allocation. The Official can give the Allocator certain favors, such as political promotion, that enhance the Allocator's utility by *P*, at a cost *g* for the Official. In return, the Allocator will channel an additional amount B from the budget to the Official's hometown's infrastructure projects, at a cost *h* for the Allocator. This favored allocation B is valued by the Official at $\pi(B,\lambda) + \sigma(B,\lambda)$, where π represents the utility from additional political support and σ represents the utility from social preference satisfaction. We pay particular attention to B, as it manifests explicit evidence of favoritism between the Official and Allocator.

We assume that the Official's cost function $g(P,r)$ is increasing and convex in P and decreasing in r, where r represents the Official's power such that higher r implies higher power. Next, the Allocator's cost function $h(B,d)$ is increasing and convex in B and increasing in d, where d measures institutional constraints on the Allocator's discretion. We further assume that $\pi(B,\lambda)$ and $\sigma(B,\lambda)$ are both increasing and concave in B.[8]

The Official is the first mover and makes an offer to the Allocator involving (P,B). The Allocator will accept if it satisfies her participation constraint, namely that the benefit of accepting is not lower than the cost. As the first mover, the Official can fully appropriate the game's rent by making an offer such that the Allocator is indifferent as to whether to accept or refuse it. The offer then solves the following maximization problem:

$$\text{Max}_{(P,B)} \ \pi(B,\lambda) + \sigma(B,\lambda) - g(P, r) \text{ s.t. } P - h(B,d) \geq 0. \quad (1)$$

[8] We assume that the costs of direct monetary transfers between the two agents are much higher than the costs of providing favor, so monetary transfers, or bribes, are not realistic options. In practice, exchanges of both bribes and favors may coexist. We refrain from modeling explicit bribes because it would not add insight to our empirical setup.

We will now state three propositions about the existence, distribution and motives of favoritism. These propositions provide the basis for the subsequent empirical investigation presented in this paper.

Proposition 1: Assume that (A1): $\pi'_B(0,\lambda) + \sigma'_B(0,\lambda) - g'_P(h(0,d),r)h'_B(0,d) > 0$. There exists a unique solution (P*,B*) to this model, with positive favored allocation B*>0, determined by the following equations:

$$\pi'_B(B^*,\lambda) + \sigma'_B(B^*,\lambda) - g'_P(h(B^*,d),r)h'_B(B^*,d) = 0 \quad (2),\ P^* = h(B^*,d).$$

Intuitively, this proposition shows that if there is positive net marginal benefit of favored allocation B at 0, then a positive level of favoritism will occur. As a result, even in an authoritarian regime where the electoral motivation is absent, if the marginal social motivation is sufficiently large then favoritism will arise. (Proof in the Appendix)

Proposition 2: (a) Assume that (A2a) the marginal cost g'_P is decreasing in r, then the favored allocation B* is increasing in r; (b) Assume that (A2b) the marginal cost h'_B is increasing in d, then the favored allocation B* is decreasing in d.

Result (a) implies that a higher-powered official can exercise more favoritism for his home commune. This relation allows us understand the power structure in a political system through observing the favoritism of different officials. Notice that what matters is the cross derivative of g with respect to P and r, and not the first derivative of g with respect to r. A higher-ranked official can get a better deal because P and r are complements. Result (b) implies that favoritism is more widespread when local authorities have more discretionary power to make a deal. (Proof in the Appendix)

Proposition 3: If the marginal benefits $\sigma'_B(B,\lambda) + \pi'_B(B,\lambda)$ are increasing (decreasing) in λ (A3), then the favored allocation B* is increasing (decreasing) in λ.

This result shows that the effect of administrative level λ on the value of favored allocation essentially depends on its effect on the marginal benefits (Proof in the Appendix). As discussed previously, it is realistic to assume that at a larger administrative level, social preferences become less important and political motivation more important. At a larger level, social connections arguably become less frequent or salient, so the improved utility derived from more favored allocation is less valuable, i.e. $\sigma'_B(B,\lambda)$ decreases when λ increases. On the other hand, a larger level is more politically influential, so additional favored allocation can potentially bring more benefit, i.e. $\pi'_B(B,\lambda)$ increases when λ increases. Overall, our prior on the effect of λ on the total marginal benefit, namely $\sigma'_B(B,\lambda) + \pi'_B(B,\lambda)$, depends on whether social preferences or political influences are more dominant. Empirically, evidence that B* is increasing in λ is consistent with $\sigma'_B(B,\lambda) + \pi'_B(B,\lambda)$ being increasing in λ, in which case the social preference effect through σ'_B must have dominated the political motivation effect through π'_B.

We can also consider the special case where the Official is the same as the Budget Allocator, political favor exchange becomes irrelevant and the Official only has to pick B to maximize his net gain of $\pi(B,\lambda) + \sigma(B,\lambda) - h(B,d)$. This problem has a unique solution B* that satisfies $\pi'_B(B^*,\lambda) + \sigma'_B(B^*,\lambda) - h'_B(B^*,d) = 0$ (as $\pi'_B(B,\lambda)$ and $\sigma'_B(B,\lambda)$ are both decreasing in B while $h'_B(B,d)$ is increasing). As in propositions 2 and 3 above, this unique solution B* increases when d is lower (assuming that h'_B is increasing in d) and when $\sigma'_B(B,\lambda)$ is higher for every value of B.

Propositions 1 to 3 are illustrated in Figure 1. Two key functions of the favored allocation B, namely the positive and negative parts in equation (2), are represented by a downward sloping marginal benefit curve $\pi'_B(B,\lambda) + \sigma'_B(B,\lambda)$ and an upward sloping "pseudo-marginal" cost curve $g'_P(h(B,d),r)h'_B(B,d)$. The two must intersect at the unique solution B*. An increase in r or d raises

the pseudo-marginal cost curve, thus reducing B* to B_1. On the other hand, an increase in either coming $\pi'_B(B,\lambda)$ or $\sigma'_B(B,\lambda)$ pushes the marginal benefit curve up and moves B* to B_2.

[Insert Figure 1 here]

This model provides a simple framework for understanding favoritism under various political systems, as previously examined in the existing scientific and journalistic literatures. In institutional environments with strong governance and high accountability, both g'_P (the Official's marginal cost to grant political favor) and h'_B (the Allocator's marginal cost to distort the local budget) are prohibitively high. The resulting amount of budget distorted by favoritism B* is then minimal, if at all. This applies to strong democracies as well as non-democratic regimes with a well-functioning system of checks and balances on the majority of officials, such as Singapore's – the lack of political incentives in those regimes, i.e. low π'_B, may further dampen favoritism. In effect, it suffices to raise either g'_P or h'_B, i.e. either the accountability of high-rank officials or that of local administrative units, to curb B*.

The model also shows that while evidence of favoritism from heads of state such as Colonel Gaddafi or President Félix Houphouët-Boigny abound, it is unclear whether favoritism is widespread in these contexts. A strong dictator may only tolerate his own favoritism and punish his coordinates'; this is a case of $g'_P=0$ for the dictator, but very high for everyone else. In such cases, democratization and/or decentralization could increase π' and lower h'_B, both leading to more widespread favoritism. For that reason, favoritism may also be found in democratic countries, such as in certain cases in the U.S. or India where the marginal cost g'_P is low.

The model's application to an authoritarian setting yields key empirical predictions on the effects of officials' promotions on home commune infrastructure, a manifestation of favored budget allocation. First, because of a lack of checks and balances, the marginal costs g'_P and h'_B are expected

to be low in Vietnam, so the phenomenon of hometown favoritism is predicted to be widespread among officials, even beyond the top leaders (**Hypothesis I**). Second, hometown favoritism depends positively on the official's power in the authoritarian hierarchy and on the home province's discretionary power (**Hypothesis II**). Third, hometown favoritism is most present where the attachment between the official and the hometown is strongest. We expect that the marginal social preference σ'_B is close to zero for communes aside from the home commune and that σ'_B for the home district is diluted to a much lower level than that of the home commune. Therefore, favoritism is predicted to decrease as we move from the home commune to neighboring communes or to the home district (**Hypothesis III**). While marginal political interest π'_B may be slightly higher at the district level, we do not expect it in practice to be of a relevant magnitude (as districts barely matter in Vietnamese politics). The subsequent sections will present the data, empirical strategy and results of the tests of these three hypotheses.

4. The Data

4.1 Data collection

As in most authoritarian countries, available data on officials and their family backgrounds in Vietnam are scarce. Available observations are highly scattered and skewed toward top officials, leading to potential selection issues. Our question requires data on the full population of ranking officials, which makes data collection more difficult. From 2009 to 2011, our data collection team identified, checked and matched officials from three major sources: the Communist Party's information on all members of the Politburo and Central Committee (which is publicly available on its websites), the National Assembly's (the legislature) information on all of its members (also publicly available on its website) and the Yearbook of Administrative Organizations' information on

Central and Provincial Government officials starting from the rank of deputy minister (Central Government) and vice chair of Provincial People's Committees (Provincial Government). These are known as the three major political bodies of Vietnamese politics. These sources cover the period from 2000 to 2010; start and end dates are based on official term dates. In practice, start and end dates that differ from term dates (e.g. an early promotion) are unusual. This puts together an exhaustive dataset of all ranking political promotions in the country during this 11-year period.

Since important officials typically hold more than one position in these organizations, we make sure to match all individuals across the three groups, if necessary by obtaining extra information from other sources. We pay special attention to clarifying information on each official's hometown, understood as the commune of patrilineal origin in the Vietnamese legal context. This legally defined information appears, for example, on individual's identity cards, and needs not correspond to one's birthplace. In the very few cases in which different hometowns are listed in different sources, we include all verifiable hometowns in the dataset. We exclude officials whose hometowns cannot be traced to the commune level (even when they are traceable to the district level).

Data on local infrastructures and public goods come from the Vietnam Household Living Standard Survey (VHLSS). This survey is supported technically and financially by the World Bank, and it is regarded as the most reliable data on living standards in the country. The VHLSS, which includes a commune survey and a household survey, is conducted every two years (2002, 2004, 2006 and 2008) from a random, representative sample of about two thousand and two hundred communes out of about eleven thousand communes in the country. The commune survey is conducted with several commune officials, while the household survey is conducted with a random sample of households in the commune. Our analysis exploits data from both surveys, including commune characteristics (i.e. area, population, average income, average expenditure, geographical

zone, rural/urban classification), presence and quality of various types of infrastructure in the communes (i.e. roads, market places, utilities, irrigation systems, schools, clinics/hospitals, cultural centers, radio stations, bank branches) and commune chairman characteristics (i.e. age, gender, education, years in position, previous position).

We then match each official to his or her commune of patrilineal origin. Only communes classified as rural are included so as to avoid the complexity of infrastructure development in urban areas. We exclude the top 4 positions in the country, namely the General Secretary of the Communist Party of Vietnam, the President, the Prime Minister and the Chairman of the National Assembly, to focus on the pervasiveness of favoritism beyond the top. This results in a total of 422 officials out of a total of 1,791 in the three sources of collected data, coming from 351 communes. These 422 officials hold a total of 678 positions, consisting of 119 positions (17.6%) in the Party Central Committee, 102 positions (15.0%) in the Central Government, 290 positions (42.8%) in the National Assembly and 167 positions (24.6%) in Provincial People's Committees. All 60 Vietnamese provinces, excluding the 3 national cities, are covered in this sample of 351 communes.

Finally, based on these matches we construct our *main sample*, in which each observation combines an official, his rural home commune and a year for which VHLSS data for this commune are available (2002, 2004, 2006 or 2008). We include communes that are connected to at least one official in this period. This main sample consists of 1,542 observations, roughly equally distributed over the years (376, 393, 398 and 375 observations for the years 2002, 2004, 2006 and 2008, respectively).

4.2 Data description

Table 1 summarizes data patterns. In Panel A, we describe politicians in the matched sample as well as the full collected dataset of politicians. Given that VHLSS covers only a random sample of all communes in the country, we can match roughly one quarter of collected politicians to

communes available in the VHLSS. This proportion is around 20% for Central and Provincial Governments, for which our data source contains more missing data in terms of hometown: 30% for the National Assembly and 35% for the Party's Central Committee. This is approximately the coverage rate of VHLSS for rural communes, which we are interested in. (The VHLSS oversamples rural areas compared to urban areas.)

[Insert Table 1 here]

As discussed, this period is marked by the inflation of key positions in Vietnamese politics. The size of the Central Committee increased by 26.4% between 2002 and 2007, from 148 to 187 (starting from an even lower number in its 8th term), an expansion that was matched by the number of Central Government positions (46.9%, from 128 in 1997-2002 to 188 in 2003-2007). In contrast, the size of the National Assembly was reduced from 499 in 2003-2007 to 456 in 2008-2011. Most members of the Central Committee hold more than one key position as counted in our data; the majority of them hold at least 3. Meanwhile, the majority of the legislature members do not hold any other key position. Across the matched and total samples, we see roughly similar shares of different types of positions.

Among those that have at least one connection as shown in Panel A, there are roughly two positions connected to each commune. Panel B further shows that on average each commune has 1.2 politicians in office throughout the 2000-2010 period. The survey waves of 2004 and 2008 witnessed the majority of promotions, corresponding to new terms of the Central Committee in 2007, the Government (starting in 2003-2004) and most strongly, the National Assembly (starting in 2003 and 2007). These waves are therefore largely responsible for the identification in our regressions. Our empirical strategy uses a measure of power capital, understood as the accumulated number of positions connected to a commune, regardless of whether a politician remains in that position. Panel B shows that power capital accumulates fastest for the National Assembly and more

slowly for Government and Central Committee positions. On the other hand, the coverage of our sample is fairly stable over time in terms of administrative units (commune, district or province), area and population. We observe a stark increase in the share of good-quality roads, suggestive that the effect of promotions will be most remarkable for road quality.

Communes with connections to politicians are different from the full VHLSS sample in a number of ways. The former are markedly smaller but more densely populated and considerably less likely to be poor (even though their average income is on par with the full sample's). When it comes to basic infrastructure, there seem to be important disparities regarding good-quality roads, marketplaces and radio stations. Given the concern of selection bias in the group of communes connected to at least one politician, our empirical strategy remains conservative insofar as it only uses the sample of matched communes, i.e. it aims to estimate the Average Treatment Effect on the Treated instead of the overall Average Treatment Effect of politicians' promotions.

5. Empirical Strategy

In an ideal experiment, we would randomly assign promotions to officials and estimate the impact of those promotions on the infrastructure in the politicians' hometowns. Given randomization's infeasibility, our main task is to deal with all possible endogeneity of officials' assignments. Such endogeneity may arise in several ways. Statically, more powerful provinces may have better infrastructure and more officials promoted to the Central Government. Dynamically, officials from provinces that develop faster may be promoted more quickly.

A standard solution for the first (static) type of endogeneity is to include location-fixed effect. A solution for the second (dynamic) type of endogeneity is to test if promotions of officials correlate with infrastructure improvements in communes near their home communes. If certain local conditions drive both promotions and infrastructure investment, we should see a correlation of

promotions and infrastructure in nearby communes. Another robustness check is to include leads in the regressions to see if the local infrastructure improves before officials are promoted. If this happens, it indicates a potential reverse causality problem.

Even after we have included all location-fixed effects and run these tests, there might still be another type of endogeneity. If the attitude of officials towards their hometowns correlates with their ability to get promoted, our estimation can still be biased. For example, if more practical officials care less about their home communes but get promoted more frequently, this correlation will bias our estimate towards zero. A solution to this is to include a fixed effect for each commune-official pair.

With all these considerations in mind, we use fixed-effect regressions in panel data to identify the impact of officials' promotions on infrastructure construction in their rural home communes. Our *benchmark* regression considers each unit of observation as a combination of a ranking official (as defined in the previous section), his rural home commune and a year of observation. The outcome variable is the presence of each type of infrastructure in each hometown in a given year of observation. The treatment variable is the number of positions held by each official from 2000 until the year of observation. By including fixed effects for each year, each geographical zone and each pair of official and home communes, the regressions yield an estimate of the effect of having a new ranking position on the official's hometown infrastructure. The multitude of fixed effects in use ensures that the estimate is unconfounded by any unobservable characteristics belonging to the same year, the same geographical zone or the same pair of official and hometown.

Our benchmark regression equation is as follows:

$$Infrastructure_{cpt} = \beta PowerCapital_{p,t-L} + \boldsymbol{X}_{cpt} + \delta_t + \delta_{cp} + \varepsilon_{cpt}.$$

The indices c, p, and t respectively represent the home commune c of official p in year t. L denotes the possible lag in year(s) after a promotion. The left-hand-side variable *Infrastructure* refers

to the presence of one of the different types of infrastructure in the commune, including the quality of road access to villages, local radio stations, preschools and schools, irrigation and water systems, and marketplaces. The vector $\boldsymbol{X}_{cpt}$ regroups observable controls by commune, official and year; the fixed effects by year and by commune-official pair are respectively denoted as δ_t and δ_{cp}; ε_{cpt} is the error term.

The right-hand-side variable *Power Capital* adds up all ranking positions ever held by each official until year *t-L*. It is a social-political capital measure calculated using all ranking positions ever held by each official, including terminated ones. This measure acknowledges that officials keep their connections and influence even after leaving an office. In Vietnam, while the ascension to a new position is a significant change, most of the time leaving a ranking position before retirement only means a switch to another, usually more important one. Most commonly, such switches do not prevent the official from having strong influence on his previous office, even in the case of retirement. In one recent case, for instance, a former Minister of Education had relinquished that position to become Deputy Prime Minister; however, he still exerted particularly strong influence on the Ministry of Education. In other words, the relative importance of an official in the government is best measured by the accumulation of the important, ranking positions he has held over time.

In some specifications where there is little variation at the commune level such as road access to the commune (already present in most communes), we use the corresponding village-level outcome variable (a commune usually consists of several villages.) Such variables are measured in a village randomly sampled by the VHLSS in that commune, e.g. the presence of asphalt road access to the village. Such a variable is then a noisy measure of the proportion of villages in the commune with that type of infrastructure (e.g. asphalt road access) in which the measurement error is a classical sampling error independent of all right-hand-side variables. The presence of this measurement error only increases the standard errors of estimators, without affecting their

consistency. We can thus interpret the estimate of β as the effect of an official's promotion on the proportion of villages in his home commune with a certain type of infrastructure.

In presence of the commune-official fixed effect, the fixed-effect estimator of β is identified by the changes of *Power Capital* within each pair of commune and official. It is effectively interpreted as the effect of an official's increased ranking position, i.e. his accumulation of more power, on the probability of infrastructure improvement in his home commune. In a framework with heterogeneous effects, the estimator is the treatment effect averaged over all officials where we observe a new ranking position, i.e. a change in *Power Capital*, during the considered period. Due to the fixed effects, the estimate of β is not confounded by any time-invariant characteristics of the pair commune-official, including geographical conditions of the commune such as distance to large cities, distance to major rivers and water sources and background conditions of the official including gender and education, year of participation in the ruling party and year of first-ranking position. The inclusion of a year-fixed effect further dilutes concerns about macroeconomic changes that could affect both new promotions and infrastructure construction.

The strength of a fixed-effect model is its control for all *time-invariable* factors. As discussed above, we also pay special attention to and test for *time-variant* factors, which may drive changes in both officials' promotion and communes' infrastructure. As Vietnam has more than eleven thousand communes, it is unlikely that the economic situation in a tiny home commune can affect the lot of a ranking official at the central level. The reverse causality or omitted-variable issue, if it exists, should take place at the district level, which may influence political promotions on a larger scale. If this is true, we must see a correlation between the official's promotion and the development of other communes in his home district and province. As shown in the next section, we will look for evidence for such correlation. Further, if the economic situation in a home commune leads to a

political promotion, then we may expect that changes in commune infrastructure can precede promotions. By including different leads in our econometric model, we can test for such a relation.

6. Empirical results

We employ this benchmark empirical strategy to different data subsamples to address the following questions: (i) Does favoritism arise in an authoritarian regime? (ii) Who is powerful in the political hierarchy? and (iii) What is the motive of favoritism? These questions correspond to Hypotheses I, II and III discussed in Section 3. We report the results for each question below.

6.1 Does favoritism arise in an authoritarian regime?

The more precise question is this: can officials other than top leaders exercise favoritism in authoritarian regimes? We first present our estimations of the impacts of an official's promotion to a ranking position on the construction of various types of infrastructure in his rural home commune in Table 2, using the main sample discussed in Section 4, which excludes the top leaders (General Secretary of the CPV, President, Prime Minister and Chairman of the National Assembly). We find strong positive effects on several outcomes, some with a lag, including the construction of local radio stations and the improvement of local roads within a year of the promotion, the construction of preschools and irrigation systems, the introduction of clean water access with a one-year lag and the construction of commune market places with a two-year lag.

[Insert Table 2 here]

The effects are immediate for the construction of local radio stations and the improvement of local roads. As shown in column (1), a native official's new promotion increases the probability of having a local radio station by an estimated 3.5 percentage points. Column (2) shows a similar effect of 6.2 percentage points on local road quality. This outcome variable is measured as the grade of road access (detailed in data appendix) to a village randomly sampled by the VHLSS in the

commune. As discussed in the previous section, the estimate in column (2) can be interpreted as the impact of an official's promotion on the proportion of villages in his home commune with higher-grade road access.

A new promotion effects other outcome variables with lags. With a one-year lag, we find positive impacts of the promotion on the presence of preschools and irrigation systems as well as clean water access, as presented in columns (3) to (5). The effects are 2.5 percentage points, significant at 10%; 6.4 percentage points, significant at 10% and 4.9 percentage points, significant at 5%, respectively. With a two-year lag, there is strong evidence of impact on the presence of commune marketplaces, with an estimate of 5.9 percentage points at 5% significance. The different lags observed for different outcome variables could be explained by the time required for the construction of different types of infrastructure, as a local radio station can be easily set up within one year while a commune-level market will require considerably more time for land clearance and construction. The effects of a new promotion on other outcome variables or on these same variables but with different lags, though noisier, are also qualitatively consistent with the above findings.

The main sample used in Panel A includes communes where some types of infrastructure were already present at the beginning and throughout the period from 2002 to 2008. Excluding these communes from the main sample with respect to each type of infrastructure gives us a more informative estimate of the impact of an official's new promotion on the construction of the respective type of infrastructure in his rural home commune. Panel B of Table 2 reports the benchmark regression results using such refined samples.

We find that not only do the estimates derived from these refined samples remain statistically significant despite much smaller sample sizes (with the exception of pre-school construction), they are also considerably larger than those derived from the main sample reported in Panel A. The estimated impact on local road quality increases from 6.2 percentage points in Panel A

to 9.3 percentage points in Panel B, while that on commune marketplaces increases from 5.9 to 12.6 percentage points. The increases in estimated impacts on local radio stations, irrigation systems, and clean water access, in percentage points, are from 3.5 to 16.1, from 6.4 to 12.6 and from 4.9 to 8.9 respectively, and the estimate on preschools soars to 31.8% (imprecisely estimated). The changes reflect the fact that many infrastructures are already in place (we cannot observe other improvements of existing infrastructures); therefore, the actual impact on the probability of getting each new infrastructure (with lag) is as large as 10% or even higher.

The results presented in both panels of Table 2 are consistent with the claim of widespread favoritism among Vietnamese officials, shown in the form of newly bestowed infrastructure projects in their home communes. Given that our sample does not include top leaders, this finding provides support for Hypothesis I, which states that non-top officials in authoritarian regimes also exercise favoritism.

Table 3 reports further checks on the effect of an official's new promotion on other types of outcome variables, including commune average income, expenditure and population, all with a one-year lag, and the immediate inclusion into the State's "poor commune support program," controlling for year, zone and commune-official or province-fixed effects. Column (1) reports the effect on aggregate infrastructure in the home commune, calculated as the total number of existing infrastructure items as surveyed by the VHLSS (detailed in data appendix). The estimate is 0.202, significant at 5%, suggesting that the promotion increases the probability of any new infrastructure construction by as much as 20.2 percentage points. Column (2) shows that the promotion has a significant effect of 1.7 percentage points on the commune's inclusion into the State's "poor commune support program," while, interestingly, the commune average income – the key criterion established by the law – does not even predict such inclusion. In other words, the official's promotion improves the hometown's chance of benefiting immediately from the program, in line

with the centralized nature of the program as discussed in Section 2. However, columns (3) and (4) show that there is no evidence that an official's new promotion improves (or reduces) his rural home commune's living standards in terms of its average income and expenditure. Both estimates are less than 1 percentage points and not statistically significant. Similarly, the promotion does not affect the commune population as presented in column (5).

[Insert Table 3 here]

For robustness checks, we explore alternative specifications using different controls, different fixed effects, different lags and different observation units for two key outcome variables: local road quality and the presence of commune marketplaces. These are arguably the two most important variables to economic development in communes. Table 4 summarizes this exercise.

[Insert Table 4 here]

In Panel A of Table 4, we explore the effect of a native official's promotion on local road quality (detailed in the data appendix) under various specifications. Column (1) shows the benchmark specification with immediate effect, controlling for commune average income and population, as well as year, zone and commune-official fixed effects as presented in Table 2. Columns (2) to (4) test the results with different controls, including no fixed effect, year-fixed effect only and commune-official fixed effect only. All estimates are positive, being 6.7 percentage points, significant at 1%; 2.1 percentage points, not statistically significant and 14.6 percentage points, significant at 1%, respectively. Columns (5) to (7) vary the time lag from a year before the promotion to two years after. Column (5) includes both *Power Capital* at one year after the year of observation, i.e. its one-year forward value, and *Power Capital* at the current year of observation in order to separate the effect of the promotion from potential noises that arise from circumstances that pre-date the promotion. The 1-year forward value provides a placebo test of the effect: before the year of the promotion, we should not expect a positive effect on the outcome. Results from

column (5) pass this test, as the coefficient of the 1-year forward value of *Power Capital* is negative 7.0 percentage points, significant at 10%, while the coefficient of the present value *Power Capital* is large at 11.0 percentage points, significant at 1%. Columns (6) and (7) use *Power Capital* at one and two year(s) before the year of observation, i.e. its one-year and two-year lag values. The result with a one-year lag is significant at 10%, while the result with a two-year lag is not, suggesting that the improvement in local road quality happens mostly in the immediate time window after the promotion.

Lastly, while our benchmark regressions treat each combination of an official, his home commune and year as equally weighted, in columns (8) and (9) we use alternative observation units to verify that the results are not driven by over-weighing or under-weighing certain communes. Column (8) uses a finer observation unit by combining a ranking position (an official can have multiple ranking positions), the home commune of the official in the position and a year; the treatment variable *Power Capital* then takes binary values of 0 or 1. On the other hand, column (9) uses a coarser observation unit of a commune in a year of observation, with the treatment variable *Power Capital* adding up all ranking positions accumulated by all officials coming from that commune. The impact estimates using these observation units are very close to the benchmark estimate, being 5.6 and 5.2 percentage points, respectively, and both statistically significant at 5%.

We employ similar robustness checks for the outcome variable, commune marketplaces, in Panel B of Table 4. Column (1) shows the benchmark specification with a two-year lag and the full set of controls. Columns (2) to (4) test the results with different controls and show that the effect on marketplaces is robustly significant. Columns (5) to (7) vary the time lag from one year forward to a two-year lag. There is no evidence of effect in any of these columns, suggesting that the tendency of commune marketplaces to be constructed a few years after promotions is due to their relatively larger scale of construction. Columns (8) and (9) use alternative observation units. The coefficients

in columns (2) to (4) and (8) to (9) are close to the benchmark estimate, even when some are not statistically significant at conventional levels due to small sample sizes.

One may worry that the evidence thus far arises from the official's better information on the targeted commune, which prompts the budget allocator to allocate more resources to that commune. This alternative explanation is a strong argument against most findings regarding favoritism and pork-barrel politics (e.g. Kramon and Posner 2012.) In our context, this story is inconsistent with several details. First, better information should have been shared independently of the official's power, and thus before his promotion. Many officials in the sample had already held some ranking positions, and could have well transferred their information. Because we find no effect prior to promotion, information sharing is unlikely to be the cause behind the effect on infrastructure. Second, most officials had not lived in their hometowns for an extended period, so the amount of information available to them that could improve the efficiency of public investments in those hometowns is unlikely to be better than that of local budget allocators. Finally, infrastructure projects in our analysis are widely considered necessary in all communes, so further knowledge of local conditions is unlikely to affect the decision to undertake such constructions.

6.2 Who has the power to give favors?

Next we investigate the pervasiveness and degree of favoritism among different groups of Vietnamese officials, including members of the National Assembly, Central Government and Provincial Government. While existing literature on favoritism in autocratic regimes has mostly addressed top-level officials, who have both the political interest and the power to favor certain groups within the population (e.g. Burgess et al 2011), our sample covers not only the very few at the top but also a large number of mid-level officials. Using Proposition 2a, this investigation helps shed light onto the power structure of different groups of Vietnamese political elites, as shown in Table 5. Columns 2-8 compare the effects of an official's new promotion on home commune road

quality, one of the two key outcome variables[9], using the benchmark regression in subsamples of non-chaired, all, non-National Assembly positions, Central Government positions, Provincial Government positions and some combinations of these subsamples[10].

[Insert Table 5 here]

In democracies, members of parliament are the key players in pork-barrel politics (Shepsle and Weingast 1981, Bickers and Stein 2000). In authoritarian regimes, members of parliament may play a different role since the Central Government and ruling party (whose members largely overlap) make major decisions (Malesky, Schuler and Tran 2012). In Vietnam, a regular, non-chaired member of the National Assembly without another ranking position in the CPV or Government can hardly use his parliamentary membership as leverage for any real benefits. Column (2) shows that an official's new promotion to such a non-chaired position in the National Assembly has no detectable effect on his home commune road quality: the impact estimate is only 1.9 percentage points and not statistically significant at conventional levels, compared to the benchmark estimate of 6.2 percentage points. Even when we extend this subsample to all National Assembly positions in column (3), the impact estimate is still negligible, being only 2.8 percentage points and not statistically significant at conventional levels. On the contrary, in the subsample of non-National Assembly positions in column (4), which includes all remaining Central Government, Provincial Government and Party's Central Committee positions, we find a large impact estimate of 10.0 percentage points, significant at 1%. This difference in statistical significance level is not driven by sample sizes, as the number of observations in columns (2)-(4) are roughly even. Overall, these results are consistent with our view

[9] We also ran similar tests using other outcome variables, including the other key outcome variable, presence of commune marketplaces. The results from these tests are qualitatively similar to those presented above, although less significant.

[10] An official could hold more than one position (e.g. a minister who is also a non-chair parliamentary member) and therefore could be included in more than one subsample. The corresponding independent variable *Accummulated Power* only reflects the relevant positions for each subsample.

that the parliament has little power within the Vietnamese political hierarchy and therefore its members have limited bargaining power to redirect resources to their hometowns.

Columns (5)-(7) report the effect of an official's new promotion on his commune road quality in a subsample of Central Government positions, a subsample of Provincial Government positions and the combined subsample. All three point estimates are large, being 17.3, 8.2, and 9.3 percentage points, respectively, compared to the benchmark estimate of 6.2 percentage points and, except for one with a small sample size, all statistically significant at 5%. Furthermore, we find that a promotion to a Central Government position has a larger and statistically stronger impact on home-commune road quality than a promotion to a Provincial Government position (17.3 compared to 8.2 percentage points), even though provincial leaders have direct control over budgetary allocations to communes. This result suggests the existence of an informal channel of influence through exchanges of personal favors (i.e. between a Central Government member and a local leader in this context) as described in our theoretical model, and the considerable political power of the Central Government that allows it to affect public decisions beyond its jurisdiction.

Finally, column (8) reports the effect of an official's new promotion on his commune road quality in the subsample of "middle-ranking" positions. As Proposition 2a suggests, the more political power an official has, the larger the amount of favored allocation he can direct to his home commune. Thus, we would like to investigate if the effects of an official's new promotion on his commune road quality found in columns (4)-(7) are largely driven by only a few top-level officials, or if the observed hometown favoritism is much more pervasive among Vietnamese political elites. To do so, we construct a subsample of "middle-ranking" positions, which excludes not only the top 4 positions as in the benchmark sample but also all Deputy Prime Ministers, Vice Presidents, members of the Politburo and chair-holding members of the Central Committee. The estimate of impact on improvement in local road quality in this subsample is 7.2 percentage points and significant at 5%.

Although this estimate is, as expected, lower than that of 9.3 percentage points in the subsample of all non-National Assembly positions, it provides clear evidence that favoritism is not limited to only top-level officials, as shown in the existing literature, but is pervasive also in the midrange of Vietnamese politics.

Together, the results from Table 5 show that hometown favoritism is a phenomenon widespread across different groups and ranks of Vietnamese officials, consistent with Hypothesis I. The magnitude of such favoritism varies substantially among different ranks and divisions within the government, consistent with Hypothesis II. In particular, we find that even Provincial Government officials are more powerful than members of the legislative National Assembly. Central Government officials, who have no authority over commune budget, turn out to be the most powerful in directing these public resources toward their hometowns. This pattern underlines the importance of informal authority and the inconsequence of legislative bodies in less democratic countries.

We now ask which institutional environments are more likely to encourage or prohibit the sort of favoritism discussed above, using a measure of provincial governance. As district and provincial authorities decide commune budgets, ranking officials must seek approval from these offices in order to intervene in infrastructure construction in their hometowns. Consequently, when provincial leaders have more flexibility in crafting policies, they can better commit to and honor quid-pro-quo deals with ranking officials; in such cases the latter are expected to be more able to channel resources toward their hometown budgets. We test this hypothesis with the use of provincial governance indicators taken from the Vietnam Provincial Competitiveness Indices (PCI), a set of survey-based indices of industries' governance perceptions that has been systematically constructed with the help from the UNDP since 2006. Among the available indicators, we select three that are relevant to the discretionary power of provincial leadership, including the index of provincial leadership proactiveness, the index of the lack of informal costs to business and the

transparency score of the province. We synthesize a composite measure of provincial discretionary policies, abbreviated as PDP, as the proactiveness score minus the score on lack of informal costs, minus the transparency score, and take its average over the period of 2006 to 2008, the period during which the PCI overlaps with our sample. As in previous subsections, the sample is divided at the median of the PDP scores. Table 6 reports the benchmark regression results for the two subsamples.

[Insert Table 6 here]

Panels A and B of Table 6 present the benchmark regression results with subsamples of communes in provinces with above-median PDP scores (i.e. where provincial leaderships have more discretionary power) and those with below-median PDP scores, respectively. The effects of a native official's promotion on two key outcome variables – local road quality and presence of commune marketplaces – in each subsample as shown in columns (2) and (6) of each panel confirm our hypothesis that more flexible provincial institutional environments better allow ranking officials to influence new infrastructure construction in their home communes. In the subsample with higher PDP scores, the estimates for improvement in local road quality and construction of commune marketplaces are both large (7.1 and 8.5 percentage points, respectively) and significant (at 5%), while in the other subsample, the effects are not statistically significant at conventional levels. These results suggest that discretionary authority facilitates favoritism.

6.3 What is the motive of hometown favoritism?

In existing studies of political favoritism, the identification of the motive of favoritism represents a formidable challenge. Officials may favor friends and relatives because of directed altruism towards their kin, or as a result of strategic calculation in building and profiting from a political base. For instance, pork-barrel politics are mostly explained in terms of rewards to political constituencies, and

ethnic favoritism by certain dictators arguably serves to build a coalition of support (Padro-i-Miquel 2007).

Political motive versus social preference: In our empirical context, we can compare the importance of these two motives by assessing favoritism at the commune and the district levels. As argued in Proposition 3, moving from the commune to the district dilutes the social preference motive, since the larger population is less related to its officials. In contrast, the political motive is reinforced because a larger district can leverage greater political support for its officials. We thus test for the political support mechanism by replicating the set of benchmark regressions on samples that match ranking officials to their home districts instead of their home communes. Table 7 summarizes the results from this exercise.

[Insert Table 7 here]

Each observation used in Panel A of Table 7 combines a ranking official, his home district and a year for which VHLSS data for at least one commune in that district are available. The value of each outcome variable at the district level is then calculated as the average among all the surveyed communes in the district. The resulted estimates are all well below 1 percentage point and are not statistically significant at conventional levels; thus they refute the explanation that ranking officials grant favors to their home districts in exchange for political support at the local level. In Panel B of Table 7, we estimate the impact of an official's new promotion on infrastructure construction in non-home communes in his home district, using a sample in which each observation combines a ranking official, a non-home commune in his home district and a year for which VHLSS data for the commune are available. Again, all the resulting estimates are close to zero and not statistically significant. These results show strong evidence that the observed favoritism is driven by officials' social preferences toward their hometowns rather than by their desires for political support. This is consistent with Hypothesis III.

Connection: Let us investigate the favoritism motive further. If favoritism is based on the preference of ranking officials, we should expect that the social distance between the official and his rural home commune determines the magnitude of favoritism. We use the age gap between the official and the commune chairperson as a proxy for social proximity.[11] In Table 8, we report the results from the benchmark regressions with subsamples divided according to the age gap between the official and his home commune's chairperson, using the sample median of a 10-year age gap as the division threshold.

[Insert Table 8 here]

Panels A and B of Table 8 present the benchmark regression results for the subsamples of communes where the age gap is below and above 10 years, respectively. Panel A shows that a commune benefits greatly from a native official's promotion when the commune chairperson and the official are of the same generation: the estimate for improvement in local road quality is 10.0 percentage points, significant at 1%, and that for commune marketplaces is 6.1%, though not statistically significant due to small sample size. All coefficients in Panel A are considerably larger than their counterparts in Panel B, where the commune chairperson is not of the same generation as the official. In fact, the only significant effect in Panel B is that of local road quality, but even that effect is only two thirds of the corresponding effect found in Panel A. The evidence suggests that commune chairs play an active role in the mechanism at work, and all the more so when they are closer to the promoted native officials.

Commune needs: If favoritism is principally motivated by an official's social preferences for his hometown, we expect the effect to be declining in the commune's average income, as the official is less willing to give to his wealthier relatives. This decline should be similar for the two key

[11] VHLSS is fortunately one among the very few surveys of the World Bank's Living Standards Measurement Surveys that includes information on commune officials.

infrastructures in our paper, measured as local road quality and presence of commune marketplaces. On the other hand, one may expect the benefits per capita of a marketplace to be increasing in the population size, thanks to the economies of scale of such a service. Therefore, the effect on marketplace construction is expected to be increasing in the population size of the commune. Since the economies of scale are much less clear in the case of village roads, we should not expect a relationship between the effect on local road quality and the commune population size.

The variation of the favoritism effect on local road quality and the presence of commune marketplaces is best illustrated with graphs that show the non-parametric relationship between each effect and the baseline variable (average income or population size). We construct such graphs by running semi-parametric local linear regressions of the outcome variable (namely local road quality or commune marketplace) at each value of the baseline, weighted by a Gaussian kernel with a bandwidth of 10% of the total range of the baseline,[12] on the treatment variable of *Power Capital* (with a two-year lag for presence of commune marketplaces) together with the controls and fixed effects in the benchmark regression; we then use the estimated effect as the local, semi-parametric estimate of a native official's promotion on the outcome at each value of the baseline variable. To provide an example, in Figure 2 Panel A we divide the full range of the logarithm of commune's average income into a 100-point grid, run a local linear regression of village road quality on *Power Capital* with Gaussian kernel weight at each of these points, using all controls and fixed effects in the benchmark regression in Table 1A, and then report the estimated coefficient of *Power Capital* as a point on the graph.

Figure 2 then reports the variations of favoritism according to average income for local road quality (Panel A) and presence of commune marketplaces (Panel B). Both figures clearly show a sharp drop in favoritism at a certain level of income, consistent with the explanation regarding social

[12] The results are very similar when we vary the bandwidth from 5% to 20% of the total range.

preferences directed towards hometowns. Figure 2 shows the analogous variations according to population size. While it is hard to recognize a trend in the effect for local road quality, we can see clearly the increasing effect for the presence of commune marketplaces for the most important range of values of population size. The findings from these figures support our explanation regarding the directed social preference motive of government officials.

7. Concluding Remarks

In this paper, we attempt to show a causal link between the promotion of officials to ranking positions in high office and infrastructure developments in their home communes. Using a fixed-effect model on panel data of commune infrastructure, we find evidence of widespread favoritism in the construction of different types of infrastructure including roads, marketplaces, irrigation, schools, radio stations, safe water access and access to the State's "poor commune support program." The magnitude of this favoritism depends on the position of the official, the respective provincial environment and the connection between the official and his rural home commune. While middle-ranking officials in the Government have significant ability to exercise favoritism, non-chair members of the legislative National Assembly do not. This power difference is in stark contrast to the politics that we have known in democracies. Further, ranking officials without formal, hierarchical authority over local budgets can evidently direct resources to their hometown budgets, suggesting that favoritism is exercised through informal influence. Communes better connected to promoted native officials and in provinces where provincial leaderships have more discretionary power tend to reap more benefits from favoritism.

We observe that officials target their favors narrowly to their small home communes instead of distributing them over their whole home districts. The entire population of a commune is politically negligible in the Vietnamese context, and unlikely to matter to the official's career. It is

thus unlikely that the findings are due to reverse causation or to strategic behaviors in building political support bases. We also use year- and commune-official fixed effects to eliminate concerns of time-invariant unobservable factors affecting both the promotion and the outcomes. Therefore, the results suggest a form of social preference towards social relatives that prevails in environments with low transparency, high discretionary power on the part of local officials and a strong social connection between ranking officials and their relatives along social lines such as ethnicity, race, clan or geographic origins.

The important question of efficiency has been left out in this paper, as it is in most related studies. It is not exactly clear how the favoritism pattern identified here affects the efficient allocation of public resources, an issue discussed by Hsieh and Klenow (2009). Apart from the intuitive interpretation that it could cause serious misallocations of public resources, one might also speculate that officials possess better information about their home communes and therefore can direct public resources to more efficient use in them. This information channel presents a formidable challenge to the broad literature on favoritism and patronage politics. Testing this efficiency gain or loss represents an interesting avenue for future research. In our study, it is unlikely that favoritism leads to a more efficient use of resources. Even if promoted officials know their communes' needs, it is unlikely that they do better than local budget authorities in suggesting more efficient allocation. Besides, were it to exist, their information advantage should have materialized even before the promotion, and should have spilled over to neighboring communes as well. These two predictions are not supported by our empirical results; however, we remain cautious in making claims about efficiency.

Standard economic theory would predict that marginal incentives for corruption, defined as the abuse of public office for personal (individual or close family) gain, will diminish as office holders become richer. It implies that in the long run, growth and stable politics will reduce

corruption rates. Our results challenge this view. Because of their willingness to abuse power to channel public resources to social connections, ranking officials may maintain an appetite for corruption far beyond their own consumption and accumulation of wealth. This motive of favoritism runs independently of quid-pro-quo political support, and could thus be present in developed countries as well (Hyytinen, Lundberg and Toivanen 2007), although in such cases political concerns would confound the empirical association between power and favoritism. Socially motivated favoritism should be an important consideration in designing measures against corrupt behaviors on the part of public officials, not only in authoritarian regimes but also in countries where democracy and transparency are less than perfect.

8. References

Abrevaya, Jason and Daniel S. Hamermesh (2012). "Charity and Favoritism in the Field: Are Female Economists Nicer (To Each Other)?" *Review of Economics and Statistics,* 94(1), 202-7.

Angelucci, Manuela. Giacomo De Giorgi, and Imran Rasul (2012). "Resource Pooling within Family Networks: Insurance and Investment." Unpublished paper. University College London

Angelucci, Manuela, Giacomo De Giorgi, Marcos A. Rangel, and Imran Rasul (2007). "Extended Family Networks in Rural Mexico: A Descriptive Analysis." In *CESifo Conference Volume on Institutions and Development,* edited by Timothy Besley, and Raji Jayaraman. MIT Press.

Banerjee, Abhijit and Rohini Somanathan (2007). "The Political Economy of Public Goods: Some Evidence from India." *Journal of Development Economics,* 82(2), 287-314.

Batabyal, Amitrajeet A. and Hamid Beladi (2008). "Bribery and Favoritism in Queuing Models of Rationed Resource Allocation." *Journal of Theoretical Politics,* 20, 329-38.

Besley, Timothy, Rohini Pande, Lupin Rahman, and Vijayendra Rao (2004). "The Politics of Public Good Provision: Evidence from Indian Local Governments." *Journal of the European Economic Association,* 2(2-3), 416-426.

Besley, Timothy, Pande Rohini, and Vijayendra Rao (2012). "Just Rewards? Local Politics and Public Resource Allocation in South India." *World Bank Economic Review,* 26(2), 191-216.

Bickers, Kenneth N. and Robert M. Stein, (2000). "The Congressional Pork Barrel in a Republican Era." *Journal of Politics,* 62(4), 1070-86.

Burgess, Robin, Rémi Jedwab, Edward Miguel, Ameet Morjaria, and Gerard Padro-i-Miquel (2011). "Ethnic Favoritism." Unpublished paper. London School of Economics.

Burguet, Roberto and Martin K. Perry (2007). "Bribery and Favoritism by Auctioneers in Sealed-Bid Auctions." *B.E. Journal of Theoretical Economics*, 7(1), 23.

Calderon, Cesar A., Enrique Moral-Benito, and Luis Servén (2011). "Is Infrastructure Capital Productive? A Dynamic Heterogeneous Approach." Banco de Espana Working Paper No. 1103.

Chattopadhyay, Raghabendra and Esther Duflo (2004). "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India." *Econometrica,* 72(5), 1409-1443.

Dawkins, Richard. (1976). *The Selfish Gene.* Oxford University Press

Do, Quoc-Anh, Yen-Teik Lee, Bang Dang Nguyen, and Kieu-Trang Nguyen (2011). "Out of Sight, Out of Mind: The Value of Political Connections in Social Networks." Sciences Po working paper.

Duran, Miguel A. and Antonio J. Morales (2011). "Favoritism in the Matching Process: The Rise and Spread of Favoritism Practices in the Labor Market." Unpublished paper. University of Málaga.

Ferejohn, John (1974). *Pork Barrel Politics: Rivers and Harbors Legislation, 1947–1968*. Stanford

University Press.

Franck, Raphaël and Ilia Rainer (2012). "Does the Leader's Ethnicity Matter? Ethnic Favoritism, Education and Health in Sub-Saharan Africa." *American Political Science Review,* 106(2), 294-325.

Gajwani, Kiran and Xiaobo Zhang (2008). "Gender, Caste, and Public Goods Provision in Indian Village Governments." International Food Policy Research Institute (IFPRI) discussion paper, 807.

Garicano, Luis, Ignacio Palacios-Huerta, and Canice Prendergast (2005). "Favoritism Under Social Pressure." *Review of Economics and Statistics,* 87(2), 208-216.

Gluckman, Max (1955). *The Judicial Process among the Barotse of Northern Rhodesia.* The Free Press.

Goldman, Eitan, Jörg Rocholl, and Jongil So (2009). "Do Politically Connected Boards Affect Firm Value?" *Review of Financial Studies*, 22(6), 2331-60.

Helmke, Gretchen and Steven Levitsky (2003). *Informal Institutions and Comparative Politics: A Research Agenda.* Cambridge University Press.

Hsieh, Chang-Tai and Peter J. Klenow (2009). "Misallocation and manufacturing TFP in China and India." *Quarterly Journal of Economics,* 124(4), 1403-1448.

Hunt, Peter Cody (2002). *An Introduction to Vietnamese Culture For Rehabilitation Service Providers in the U.S.* Center for International Rehabilitation Research Information and Exchange. (Accessed at http://cirrie.buffalo.edu/culture/monographs/vietnam/ on November 9, 2012.)

Ioannides, Yannis and Linda D. Loury (2004). "Job Information Networks, Neighborhood Effects, and Income Inequality." *Journal of Economic Literature,* 92, 1056-1093.

Kaja, Ashwin and Eric Werker (2010). "Corporate Governance at the World Bank and the Dilemma of Global Governance." *World Bank Economic Review,* 24(2), 171-198.

Keefer, Philip and Stuti Khemani (2009). "When Do Legislators Pass on Pork? The Determinants

of Legislator Utilization of a Constituency Development Fund in India." *American Political Science Review,* 103(1), 99-112.

Khemani, Stuti (2010). "Political Economy of Infrastructure Spending in India." World Bank Policy Research Working Paper Series, 5423.

Khwaja, Asim and Atif Mian (2005). "Do Lenders Favor Politically Connected Firms? Rent Provision in an Emerging Financial Market." *Quarterly Journal of Economics,* 120, 1371-1411.

Kingombe, Christian K.M. (2011). "Mapping the new infrastructure financing landscape," Overseas Development Institute Background Notes.

Kopeck, Petr and Gerardo Scherlis (2008). "Party Patronage in Contemporary Europe." *European Review*, 16(3), 355-371.

Kramon, Eric J. and Daniel N. Posner (2012). "Ethnic Favoritism in Primary Education in Kenya." Unpublished paper. University of California, Los Angeles

Leider, Stephen, Markus M. Möbius, Tanya Rosenblat, and Quoc-Anh Do (2009). "Directed Altruism and Enforced Reciprocity in Social Networks." *Quarterly Journal of Economics,* 124(4), 1815-51.

Levitt, Steven D. and James M. Snyder, Jr. (1995). "Political Parties and the Distribution of Federal Outlays." *American Journal of Political Science,* 39(4), 958-80.

Malesky, Edmund and Paul Schuler (2009). "Paint-by-numbers Democracy: The Stakes, Structure, and Results of the 2007 Vietnamese National Assembly Election." *Journal of Vietnamese Studies,* 4(1), 1-48.

Malesky, Edmund and Paul Schuler (2011). "The Single-Party Dictator's Dilemma: Information in Elections without Opposition." *Legislative Studies Quarterly,* 36(4), 491-530.

Mitchell, J. Clyde (1969). *Social Networks in Urban Situations: Analysis of Personal Relationships in Central African Towns*. Manchester University Press

Nguyen, Binh Thi Thanh and Dana Healy (2006). *Aspects of Vietnamese Culture*. The Gioi Publishing.

Padro-i-Miquel, Gerard (2007). "The Control of Officials in Divided Societies: The Politics of Fear." *Review of Economic Studies,* 74(4), 1259-74.

Padro-i-Miquel, Gerard, Nancy Qian, and Yang Yao (2012). "Voter Heterogeneity and Public Goods: Evidence from Religious Fragmentation and Elections in China." Unpublished paper. London School of Economics.

Persson, Petra and Ekaterina Zhuravskaya (2011). "Elite Capture in the Absence of Democracy: Evidence from Backgrounds of Chinese Provincial Leaders." Paris School of Economics working paper.

Persson, Torsten (2002). "Do Political Institutions Shape Economic Policy?" *Econometrica,* 70(3), 883-905.

Prendergast, Canice and Robert H. Topel (1996). "Favoritism in Organizations." *Journal of Political Economy,* 104, 958-78.

Radcliffe-Brown, Alfred (1922). *The Andaman Islanders*. Cambridge University Press.

Ray, Bruce A. (1981). "Military Committee Membership in the House of Representatives and the Allocation of Defense Department Outlays." *Western Political Quarterly,* 34(2), 222–34.

Rundquist, Barry S. and Thomas M. Carsey (2002). *Congress and Defense Spending: The Distributive Politics of Military Procurement*. University of Oklahoma Press.

Sahoo, Pravakar, Ranjan Kumar Dashban, Geethanjali Nataraj (2012). "China's Growth Story: The Role Of Physical And Social Infrastructure," *Journal of Economic Development,* 37(1), 53.

Shepsle, Kenneth A. and Barry R. Weingast (1981). "Political Preferences for the Pork Barrel: A Generalization." *American Journal of Political Science,* 25(1), 96-111.

Shioji, Etsuro. 2001. "Public Capital and Economic Growth: A Convergence Approach." *Journal of*

Economic Growth, 6(3), 205-27

Tabellini, Guido (2010). "Culture and Institutions: Economic Development in the Regions of Europe." *Journal of the European Economic Association,* 8(4), 677-716.

Tarp, Finn and Thomas Markussen (2011). "Political Connections and Investment in Rural Vietnam." World Institute for Development Economic Research (UNU-WIDER) working paper, WP2011/037.

Williams, George C. (1966). *Adaptation and Natural Selection.* Princeton University Press.

9. Appendix: Proof of Propositions

Proof of Proposition 1: The Lagrangian of this optimization problem, $\pi(B,\lambda) + \sigma(B,\lambda) - g(P, r) - \lambda[P - h(B,d)]$, implies the first order conditions:

$$\pi'_B(B,\lambda) + \sigma'_B(B,\lambda) + \lambda h'_B(B,d) = 0 \text{ and } -g'_P(P,r) - \lambda = 0.$$

The participation constraint is binding as $P = h(B,d)$.

These conditions yield:

$$\pi'_B(B,\lambda) + \sigma'_B(B,\lambda) - g'_P(h(B,d),r)h'_B(B,d) = 0.$$

This equation has a unique solution B* because the left-hand side's derivative with respect to B is negative, as:

$$\pi''_{BB}(B,\lambda) < 0,\ \sigma''_{BB}(B,\lambda) < 0, \text{ and } g''_{PP}(h(B,d),r)[h'_B(B,d)]^2 + g'_P(h(B,d),r)h''_B(B,d) > 0.$$

The Lagrangian is concave in (P,B) because its Hessian matrix is negative definite. Therefore, (h(B*,d),B*) is the unique solution to this optimization problem under constraint. Furthermore, since the left-hand side of this equation is positive when B=0, the result of favored allocation B* must be positive **(QED)**.

Proof of Proposition 2: (a) The partial differentiation with respect to r from equation (2) yields:

$$\pi''_{BB}(B^*,\lambda)B^{*\prime}_r + \sigma''_{BB}(B^*,\lambda)B^{*\prime}_r =$$

$$[g''_{PP}(P^*,r)h'_{\mathbf{B}}(B^*,d)B^{*\prime}_r + g''_{Pr}(P^*,r)]h'_B(B^*,d) + g'_P(P^*,r)h''_{BB}(B^*,d)B^{*\prime}_r$$

$$\Leftrightarrow \{\pi''_{BB}(B^*,\lambda) + \sigma''_{BB}(B^*,\lambda) - g''_{PP}(P^*,r)[h'_{\mathbf{B}}(B^*,d)]^2 - g'_P(P^*,r)h''_{BB}(B^*,d)\}B^{*\prime}_r =$$

$$g''_{Pr}(P^*,r)h'_B(B^*,d).$$

The expression in the bracket on the left-hand side is negative while the right-hand side is positive as $g''_{Pr}(P^*,r) < 0$ based on the proposition's assumption. Therefore, $B^{*\prime}_r$ must be positive, indicating that the solution B* is increasing in r **(QED).**

(b) The partial differentiation with respect to d from equation (2) yields:

$$\pi''_{BB}(B^*,\lambda)B^{*\prime}_d + \sigma''_{BB}(B^*,\lambda)B^{*\prime}_d =$$

$$g''_{PP}(P^*,r)[h'_B(B^*,d)B^{*\prime}_d + h'_d(B^*,d)]h'_B(B^*,d) + g'_P(P^*,r)[h''_{BB}(B^*,d)B^{*\prime}_d + h''_{Bd}(B^*,d)]$$

$$\Leftrightarrow \{\pi''_{BB}(B^*,\lambda) + \sigma''_{BB}(B^*,\lambda) - g''_{PP}(P^*,r)[h'_B(B^*,d)]^2 - g'_P(P^*,r)h''_{BB}(B^*,d\}B^{*\prime}_d =$$

$$g''_{PP}(P^*,r)h'_d(B^*,d)h'_B(B^*,d) + g'_P(P^*,r)h''_{Bd}(B^*,d).$$

The expression in the bracket on the left-hand side is negative while the right-hand side is positive as $h''_{Bd}(B^*,d) > 0$ based on the proposition's assumption. Therefore, $B^{*\prime}_d$ must be negative, indicating that the solution B* is decreasing in d **(QED.)**

Proof of Proposition 3: Suppose the marginal benefits are decreasing in λ, as in the case where social preferences outweigh political supports (the opposite case is proven analogously.) Let $\lambda_1 < \lambda_2$, so $\sigma'_B(B,\lambda_1) + \pi'_B(B,\lambda_1) \geq \sigma'_B(B,\lambda_2) + \pi'_B(B,\lambda_2)$ for every B, and B_1^* and B_2^* be the corresponding solutions. We now need to show that $B_1^* \geq B_2^*$.

Recall from equation (2) that : $\sigma'_B(B,\lambda) + \pi'_B(B,\lambda) = g'_P(h(B,d),r)h'_B(B,d)$. Denote this expression as M(B). $\sigma'_B(B,\lambda) + \pi'_B(B,\lambda)$ is decreasing in B as $\sigma+\pi$ is concave in B, while M(B) is increasing in B as g and h are convex.

Assume that $B_1^* < B_2^*$, then $M(B_1^*) = \sigma'_B(B_1^*,\lambda_1) + \pi'_B(B_1^*,\lambda_1) \geq \sigma'_B(B_1^*,\lambda_2) + \pi'_B(B_1^*,\lambda_2) \geq \sigma'_B(B_2^*,\lambda_2) + \pi'_B(B_2^*,\lambda_2) = M(B_2^*)$, contradictory to M(B)'s increasing in B. Therefore, $B_1^* \geq B_2^*$ **(QED)**.

10. Tables and Figures

Table 1. Descriptive statistics

Panel A. Government officials

Official group/subgroup	Start year	End year	No. of officials		No. of positions*		Average** no. of positions	Median** no. of positions	No. of communes	
Central Committee	2002	2011	90	21%	119	18%	2.67	2	86	25%
Central Committee 9th	2002	2006	43	10%	43	6%	3.14	3	43	12%
Central Committee 10th	2007	2011	76	18%	76	11%	2.82	3	72	21%
Central Government	1997	2011	72	17%	102	15%	2.29	2	68	19%
Government from 2000 yearbook	1997	2002	23	5%	23	3%	2.65	2	23	7%
Government from 2004 yearbook	2003	2007	43	10%	43	6%	2.47	2	42	12%
Government from 2009 yearbook	2008	2011	36	9%	36	5%	2.56	2	36	10%
Provincial Government	2000	2010	105	25%	167	25%	1.92	2	97	28%
Government from 2000 yearbook	2000	2004	37	9%	37	5%	2.65	3	37	11%
Government from 2004 yearbook	2004	2006	67	16%	67	10%	2.19	2	64	18%
Government from 2009 yearbook	2006	2010	63	15%	63	9%	1.92	2	61	17%
National Assembly	2003	2011	252	60%	290	43%	1.58	1	224	64%
National Assembly 11	2003	2007	138	33%	138	20%	1.83	1	130	37%
National Assembly 12	2008	2011	152	36%	152	22%	1.70	1	144	41%
Total	**1997**	**2011**	**422**	100%	**678**	100%	**1.61**	**1**	**351**	100%

Panel B. Communes

Commune statistics	Benchmark sample					VHLSS rural commune population				
	2002	2004	2006	2008	**Overall**	2002	2004	2006	2008	**Overall**
Sample coverage										
Number of communes	311	323	328	309	**343**	2213	2238	2276	2191	**2554**
Number of districts	196	207	208	197	**215**	556	570	575	582	**610**
Number of provinces	55	59	59	57	**60**	55	59	59	57	**60**
Commune statistics										
Average area	26.9	27.0	26.7	29.0	**27.4**	39.4	35.9	39.7	41.3	**39.1**
Average population	9794	9689	9658	9714	**9713**	9039	8631	8647	8836	**8787**
Average income	404	435	572	856	**565**	342	432	574	881	**556**
% with poverty classification	13.2	13.7	14.0	12.6	**13.4**	19.2	20.9	19.4	18.0	**19.4**
Commune existing infrastructure										
% with radio station	-	81.7	86.9	85.4	**84.7**	-	77.0	80.7	80.6	**79.5**
% with good quality road	50.8	67.8	73.2	76.7	**67.2**	43.3	58.5	63.9	69.6	**58.9**
% with preschool	-	96.9	98.8	97.4	**97.7**	-	96.8	96.4	97.7	**97.0**
% with irrigation system	-	70.2	70.1	68.5	**69.6**	-	66.5	67.3	67.2	**67.0**
% with clean water supply	61.4	58.8	58.3	58.0	**59.1**	61.6	60.8	59.4	61.6	**60.8**
% with market place	-	70.0	70.7	68.3	**69.7**	-	62.2	63.6	62.9	**62.9**
Average politicians per commune										
promoted this year or the year before	0.13	0.69	0.18	0.63		-	-	-	-	
promoted/in office this year or earlier	0.29	0.77	0.83	1.21		-	-	-	-	
promoted/in office between 2000-10	1.21	1.22	1.21	1.21	**1.21**	-	-	-	-	**-**
Average power capital per commune***	0.32	1.03	1.21	1.96	**1.13**	-	-	-	-	**-**
from Central Committee positions	0.13	0.12	0.12	0.35	**0.18**	-	-	-	-	**-**
from Central Government positions	0.07	0.20	0.20	0.31	**0.19**	-	-	-	-	**-**
from Provincial Government positions	0.11	0.32	0.49	0.49	**0.35**	-	-	-	-	**-**
from National Assembly positions	0.00	0.40	0.39	0.82	**0.40**	-	-	-	-	**-**

Note:

* Numbers of unique officials & numbers of positions x terms in each group/subgroup (each subgroup represents a term)

** Average/median numbers of positions x terms held by an official in each group/subgroup throughout the 2000-10 period

*** Power capital of a commune in a year is the accumulated number of positions x terms held by officials coming from that commune up to

Table 2: Officials' power and home commune infrastructure

Panel A. Main sample

	(1)	(2)	(3)	(4)	(5)	(6)
Time lag	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	0.0346	0.0620	0.0247	0.0643	0.0485	0.0590
	(0.0201) *	(0.0242) **	(0.0127) *	(0.0356) *	(0.0197) **	(0.0239) **
Commune ave. income	0.0136	0.0356	0.00575	-0.0464	0.0472	0.0124
	(0.0271)	(0.0307)	(0.0132)	(0.0555)	(0.0310)	(0.0362)
Commune population	0.0522	0.0647	0.0792	0.239	0.0254	0.0884
	(0.0896)	(0.0872)	(0.0615)	(0.1720)	(0.0678)	(0.1010)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,155	1,533	1,157	1,155	1,528	1,157
R-squared	0.738	0.578	0.575	0.587	0.726	0.772

Panel B. Subsamples, excluding communes that already have corresponding infrastructure

	(1)	(2)	(3)	(4)	(5)	(6)
	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	0.161	0.0932	0.318	0.126	0.0886	0.126
	(0.0885) *	(0.0373) **	(0.3090)	(0.0650) *	(0.0363) **	(0.0563) **
Commune ave. income	0.0775	0.0722	0.00238	-0.105	0.0762	0.0158
	(0.0927)	(0.0561)	(0.2310)	(0.1130)	(0.0514)	(0.0733)
Commune population	0.249	0.113	-0.665	0.337	0.0239	0.435
	(0.3440)	(0.1930)	(0.7020)	(0.2340)	(0.1180)	(0.2890)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	289	895	59	620	856	473
R-squared	0.463	0.426	0.413	0.322	0.441	0.449

Note: In this table, we estimate the impact of an official's new promotion to a ranking position on the construction of each type of infrastructure in his/her home commune by relating the number of ranking positions accumulated by the official to the presence of each infrastructure in the commune, using different lags, controlling for commune current average income and population, and including year, zone, and commune-official fixed effects. Panel A reports salient results for each different lag on the main sample. Panel B replicates the Panel A regressions on a subsample excluding communes where the corresponding infrastructure was present throughout the period. Panel B reports reports similar salient results from these subsamples. Robust standard errors in brackets are clustered at commune-year level. Statistical significance is denoted by *** ($p < 1\%$), ** ($p < 5\%$), and * ($p < 10\%$).

Table 3: Favoritism in other home commune outcomes

	(1)	(2)	(3)	(4)	(5)
Time lag	1-year lag	Immediate	1-year lag	1-year lag	1-year lag
Dependent variable	Aggregate infrastructure	Poor commune support program	Commune average income	Commune average expenditure	Commune population
Power Capital	0.202	0.0169	0.0106	-0.00438	-0.00526
	(0.0881) **	(0.0083) **	(0.0275)	(0.0188)	(0.00733)
Commune ave. income	0.0520	8.91e-05			
	(0.1420)	(0.0203)			
Commune population	2.281	-0.0932			
	(0.7140) ***	(0.0270) ***			
Year FE	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes
ComOfficial FE	Yes		Yes	Yes	Yes
Province FE		Yes			
Observations	1,148	1,532	1,542	1,542	1,533
R-squared	0.769	0.434	0.688	0.779	0.953

Note: This table reports further checks on the effect of a native official's new promotion on other type of outcome variables, including commune average income, expenditure, population, inclusion into the State's "poor commune support program", and aggregate infrastructure, most with a one-year lag and controlling for year, zone, and commune-offcial or province fixed effects. Robust standard errors in brackets are clustered at commune-year level. Statistical significance is denoted by *** ($p < 1\%$), ** ($p < 5\%$), and * ($p < 10\%$).

Table 4: Alternative specifications and robustness checks

Panel A: Robustness checks with dependent variable Good road

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lag	Immediate	Immediate	Immediate	Immediate	1-year forward	1-year lag	2-year lag	Immediate	Immediate
Specification	Benchmark	No FE	Year FE	ComOfficial FE	Benchmark	Benchmark	Benchmark	Composition unit	Commune unit
Power Capital	0.0620	0.0673	0.0213	0.146	0.110	0.0426	0.0367	0.0563	0.0523
	(0.0242) **	(0.0125) ***	(0.0136)	(0.0181) ***	(0.0365) ***	(0.0245) *	(0.0266)	(0.0237) **	(0.0214) **
Power K 1-year lead					-0.0695				
					(0.0372) *				
logComAvgInc	0.0356				0.0350	0.0353	0.0366	0.0193	0.0310
	(0.0307)				(0.0306)	(0.0308)	(0.0307)	(0.0351)	(0.0294)
logComPop	0.0647				0.0706	0.0654	0.0618	0.0519	0.138
	(0.0872)				(0.0870)	(0.0869)	(0.0863)	(0.0990)	(0.0935)
Year FE	Yes		Yes		Yes	Yes	Yes	Yes	Yes
Zone FE	Yes				Yes	Yes	Yes	Yes	Yes
ComOfficial FE	Yes			Yes	Yes	Yes	Yes		
ComPosition FE								Yes	
Commune FE									Yes
Observations	1,533	1,542	1,542	1,542	1,533	1,533	1,533	2,480	1,262
R-squared	0.578	0.018	0.049	0.563	0.580	0.577	0.576	0.570	0.579

Panel B: Robustness checks with dependent variable Marketplace

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lag	2-year lag	2-year lag	2-year lag	2-year lag	1-year forward	Immediate	1-year lag	2-year lag	2-year lag
Specification	Benchmark	No FE	Year FE	ComOfficial FE	Benchmark	Benchmark	Benchmark	Composition unit	Commune unit
Power Capital	0.0590	0.0252	0.0353	0.00949	-0.0542	-0.0287	0.0284	0.0483	0.0326
	(0.0239) **	(0.0176)	(0.0189) *	(0.0188)	(0.0424)	(0.0272)	(0.0233)	(0.0195) **	(0.0217)
Power K 1-year lead					0.0315				
					(0.0414)				
logComAvgInc	0.0124				0.0104	0.0105	0.00980	-0.0170	0.00241
	(0.0362)				(0.0362)	(0.0361)	(0.0362)	(0.0390)	(0.0359)
logComPop	0.0884				0.0950	0.0965	0.0959	0.0369	0.136
	(0.1010)				(0.1020)	(0.1020)	(0.1010)	(0.0932)	(0.1210)
Year FE	Yes		Yes		Yes	Yes	Yes	Yes	Yes
Zone FE	Yes				Yes	Yes	Yes	Yes	Yes
ComOfficial FE	Yes			Yes	Yes	Yes	Yes		
ComPosition FE								Yes	
Commune FE									Yes
Observations	1,157	1,166	1,166	1,166	1,157	1,157	1,157	1,870	951
R-squared	0.772	0.002	0.002	0.765	0.771	0.771	0.771	0.765	0.778

Note: Panel A explores the effect of a native official's new promotion on local Good road under various specifications, including using different controls and fixed effects, with different lags, and using different observation units. Panel B explores the effect of a native politician's new promotion on presence of commune Marketplaces under various specifications, including using different controls and fixed effects, with different lags, and using different observation units. Robust standard errors in brackets are clustered at commune-year level. Statistical significance is denoted by *** ($p < 1\%$), ** ($p < 5\%$), and * ($p < 10\%$).

Table 5: Favoritism by different level of real budget authority

Subsample	(1) Benchmark	(2) Non-chaired National Assembly	(3) All National Assembly	(4) Non National Assembly	(5) Central Government	(6) Provincial Government	(7) Central & Provincial Government	(8) Medium ranking officials
Power Capital	0.0620	0.0189	0.0281	0.1000	0.173	0.0824	0.0930	0.0715
	(0.0242) **	(0.0471)	(0.0467)	(0.0333) ***	(0.0792) **	(0.0597)	(0.0441) **	(0.0358) **
Commune ave. income	0.0356	0.0109	0.0107	0.0327	0.0261	0.0606	0.0481	0.0422
	(0.0307)	(0.0382)	(0.0376)	(0.0391)	(0.0886)	(0.0490)	(0.0446)	(0.0398)
Commune population	0.0647	0.0431	0.0280	0.0031	0.0234	0.0697	0.0484	0.0424
	(0.0872)	(0.1180)	(0.1230)	(0.1020)	(0.1150)	(0.1670)	(0.1070)	(0.1040)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,533	861	904	829	267	393	648	832
R-squared	0.578	0.582	0.574	0.6020	0.558	0.602	0.579	0.582

Note: This table reports benchmark regression results for key outcome variable Good road using subsamples divided by different groups of Vietnamese political elites, including non-chaired National Assembly positions, all National Assembly positions, non-National Assembly positions, Central Government poitions, Provincial Governments positions, and medium-ranking positions (i.e. ministers, deputy ministers, and the equivalent, provincial leaders, and ordinary members of the Central Committee). Robust standard errors in brackets are clustered at commune-year level. Statistical significance is denoted by *** ($p < 1\%$), ** ($p < 5\%$), and * ($p < 10\%$).

Table 6: Favoritism by the flexibility of the provincial institutional environment

Panel A: Subsample of communes in provinces with above-median PDP scores

	(1)	(2)	(3)	(4)	(5)	(6)
Time lag	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	0.0629	0.0710	0.0226	0.0762	0.0474	0.0853
	(0.0311) **	(0.0319) **	(0.0216)	(0.0536)	(0.0281) *	(0.0379) **
Commune ave. incom	0.0270	0.0190	-0.00474	0.0198	0.0509	0.00119
	(0.0361)	(0.0388)	(0.0124)	(0.0835)	(0.0400)	(0.0450)
Commune populatior	0.107	0.0815	0.0218	0.300	0.0159	0.0185
	(0.0981)	(0.1300)	(0.0266)	(0.2490)	(0.1180)	(0.1030)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	606	798	608	607	793	608
R-squared	0.705	0.581	0.535	0.560	0.657	0.768

Panel B: Subsample of communes in provinces with below-median PDP scores

	(1)	(2)	(3)	(4)	(5)	(6)
Time lag	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	0.00858	0.0496	0.0226	0.0626	0.0500	0.0342
	(0.0262)	(0.0364)	(0.0158)	(0.0484)	(0.0279) *	(0.0297)
Commune ave. incom	0.0154	0.0645	0.0169	-0.134	0.0457	0.0318
	(0.0374)	(0.0473)	(0.0266)	(0.0621) **	(0.0490)	(0.0562)
Commune populatior	-0.0771	-0.00204	0.151	0.260	0.0368	0.195
	(0.1740)	(0.1190)	(0.1180)	(0.1970)	(0.0741)	(0.1910)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	549	735	549	548	735	549
R-squared	0.781	0.592	0.625	0.639	0.790	0.785

Note: In this table, Panel A reports the benchmark regression results for the subsample of communes in provinces where provincial leaderships have more discretionary power, as measured by the *Provincial Discretionary Policies*' scores (PDP). Panel B reports the benchmark regression results for the subsample of communes in provinces where provincial leaderships have less discretionary power, as measured by the provinces' PDP scores. Robust standard errors in brackets are clustered at commune-year level. Statistical significance is denoted by *** ($p < 1\%$), ** ($p < 5\%$), and * ($p < 10\%$).

Table 7: Favoritism for home district

Panel A: Sample in which ranking officials are matched to their home districts

	(1)	(2)	(3)	(4)	(5)	(6)
Time lag	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	-0.00534	0.00106	-0.000263	0.00349	0.00985	0.00471
	(0.0065)	(0.0073)	(0.0050)	(0.0125)	(0.0093)	(0.0089)
Commune ave. income	-0.00680	0.0343	-0.00312	0.0329	-0.0327	0.0479
	(0.0255)	(0.0327)	(0.0180)	(0.0375)	(0.0367)	(0.0350)
Commune population	0.0180	0.0560	0.0285	-0.0197	-0.0867	0.0859
	(0.0334)	(0.0516)	(0.0425)	(0.0370)	(0.0391) **	(0.0507) *
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,963	4,693	3,963	3,963	4,694	3,963
R-squared	0.827	0.740	0.578	0.704	0.807	0.781

Panel B: Sample in which ranking officials are matched to other communes in their home districts

	(1)	(2)	(3)	(4)	(5)	(6)
Time lag	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	-0.00571	0.00731	0.00292	0.00998	-0.00213	-0.00222
	(0.0050)	(0.0067)	(0.0039)	(0.0096)	(0.0054)	(0.0071)
Commune ave. income	0.00862	-0.0104	-0.000589	-0.000334	0.00872	-0.0156
	(0.0106)	(0.0176)	(0.0093)	(0.0220)	(0.0169)	(0.0163)
Commune population	0.00790	0.0412	-0.0378	0.00230	0.0119	0.0563
	(0.0767)	(0.0387)	(0.0562)	(0.0874)	(0.0366)	(0.1020)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,620	23,548	17,632	17,605	23,535	17,632
R-squared	0.714	0.577	0.514	0.621	0.729	0.768

Note: In this table, Panel A reports the benchmark regression results using a sample in which each observation combines a ranking official, his/her home district, and a year. The outcome variables are calculated as the average over the surveyed communes in that district. These regressions estimate the impact of an official's new promotion on infrastructure construction in his/her home district. Panel B reports the benchmark regression results using a sample in which each observation combines a ranking official, a commune in his/her home district that is not his/her home commune, and a year. These regressions estimate the impact of an official's new promotion on infrastructure construction in other communes in his/her home district. Robust standard errors in brackets are clustered at commune-year level. Statistical significance is denoted by *** ($p < 1\%$), ** ($p < 5\%$), and * ($p < 10\%$).

Table 8: Favoritism by age gaps between ranking officials and home communes' chairs

Panel A: Subsample of ranking officials and home communes' chairs whose age gaps are below median

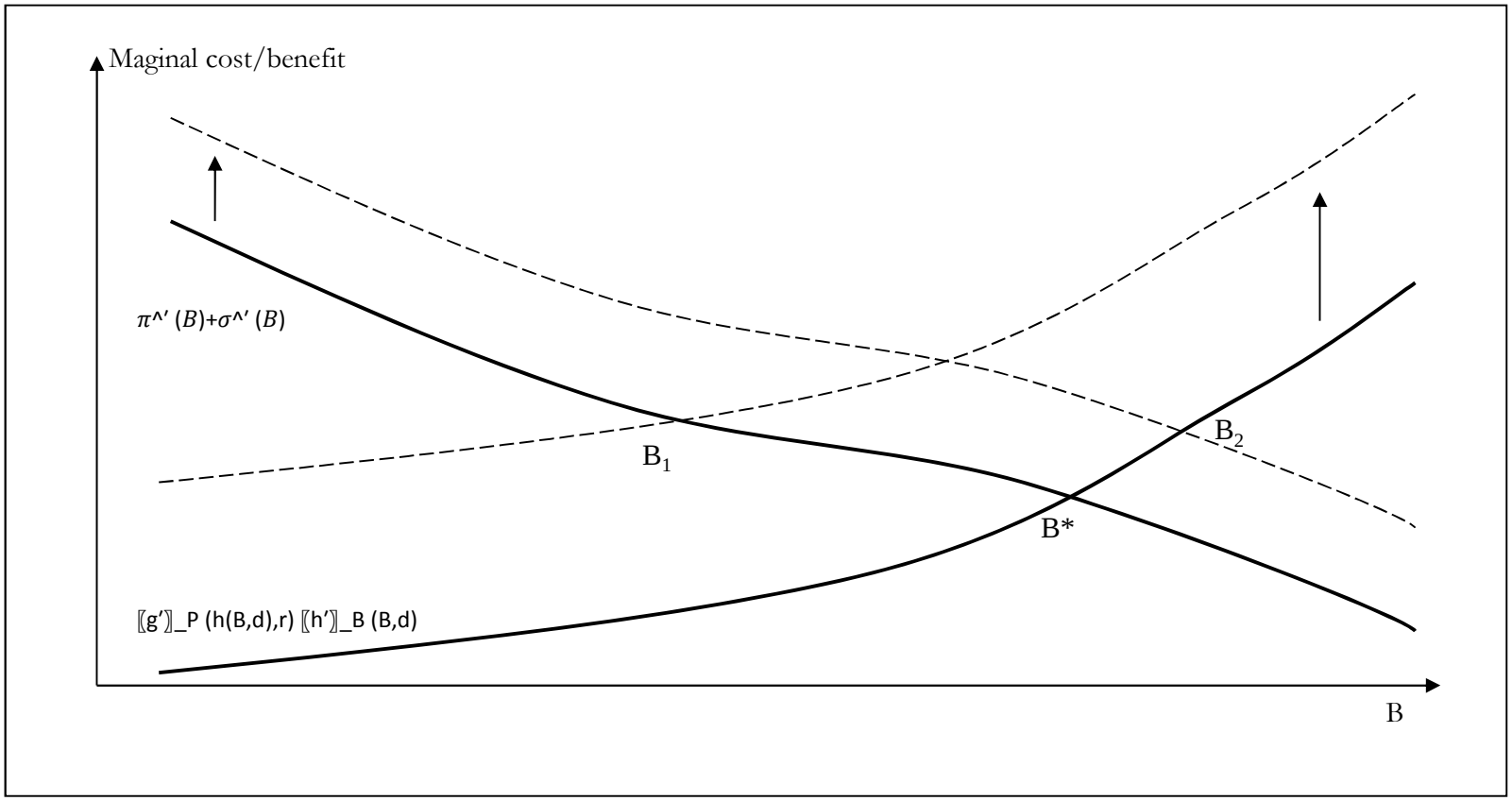
	(1)	(2)	(3)	(4)	(5)	(6)
Time lag	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	0.0427	0.101	0.0160	0.0673	0.0411	0.0608
	(0.0300)	(0.0372) ***	(0.0155)	(0.0551)	(0.0265)	(0.0441)
Commune ave. income	0.0724	0.0337	-0.00697	0.000300	0.0378	0.00922
	(0.0380) *	(0.0534)	(0.0188)	(0.0638)	(0.0518)	(0.0568)
Commune population	0.246	0.117	-0.0495	0.414	-0.102	0.100
	(0.1670)	(0.1060)	(0.0377)	(0.2490) *	(0.0754)	(0.1840)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	561	778	561	561	775	561
R-squared	0.836	0.662	0.636	0.667	0.784	0.801

Panel B: Subsample of ranking officials and home communes' chairs whose age gaps are above median

	(1)	(2)	(3)	(4)	(5)	(6)
Time lag	Immediate	Immediate	1-year lag	1-year lag	1-year lag	2-year lag
Dependent variable	Radio station	Good road	Preschool	Irrigation	Clean Water	Marketplace
Power Capital	0.0122	0.0679	0.0197	0.0446	0.0438	-0.000900
	(0.0278)	(0.0379) *	(0.0248)	(0.0634)	(0.0388)	(0.0411)
Commune ave. income	-0.0811	0.00674	0.0147	-0.101	0.107	-0.00189
	(0.0470) *	(0.0489)	(0.0247)	(0.1100)	(0.0508) **	(0.0494)
Commune population	-0.0796	0.00194	0.111	0.0879	0.0921	-0.0335
	(0.1320)	(0.1610)	(0.0943)	(0.2380)	(0.1320)	(0.1230)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes
Comm-Official FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	594	755	596	594	753	596
R-squared	0.779	0.645	0.637	0.656	0.765	0.818

Note: In this table, Panel A reports the benchmark regression results for the subsample of ranking officials who are more likely to have close relationships with their home communes' leaderships, as measured by the age gaps between the officials and their home communes' chairs (i.e., age gaps of 9 and below). Panel B reports the benchmark regression results for the subsample of raking officials who are less likely to have close relationships with their home communes' leaderships, as measured by the age gaps between the officials and their home communes' chairs (i.e., age gaps of 10 and above). Robust standard errors in brackets are clustered at commune-year level. Statistical significance is denoted by *** ($p < 1\%$), ** ($p < 5\%$), and * ($p < 10\%$).

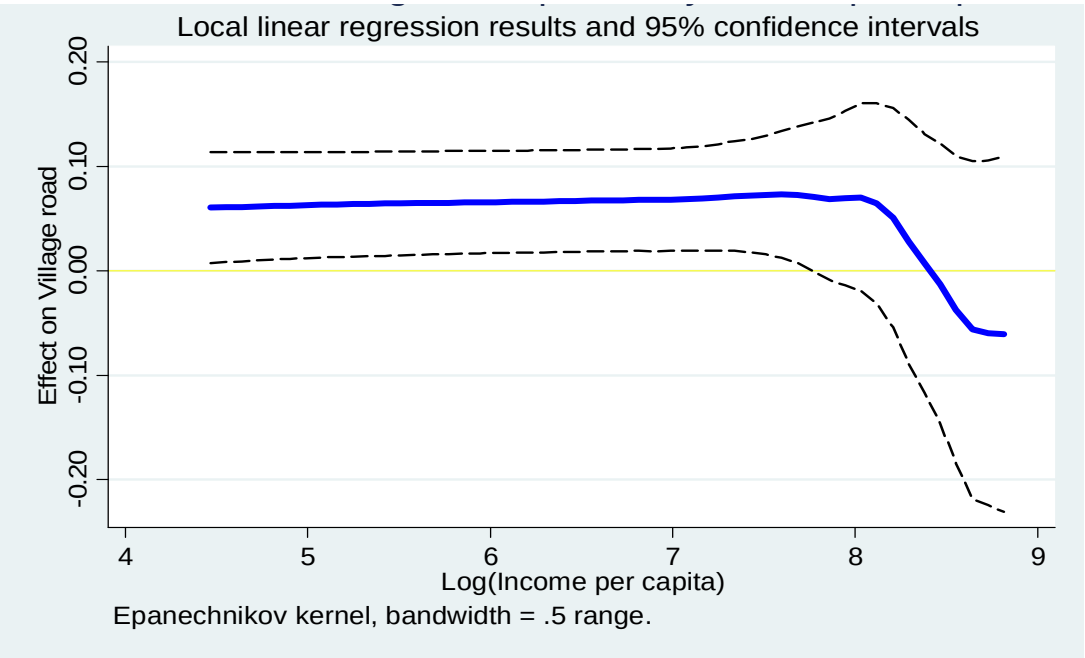
Figure 1: Model solution of favored allocation B*



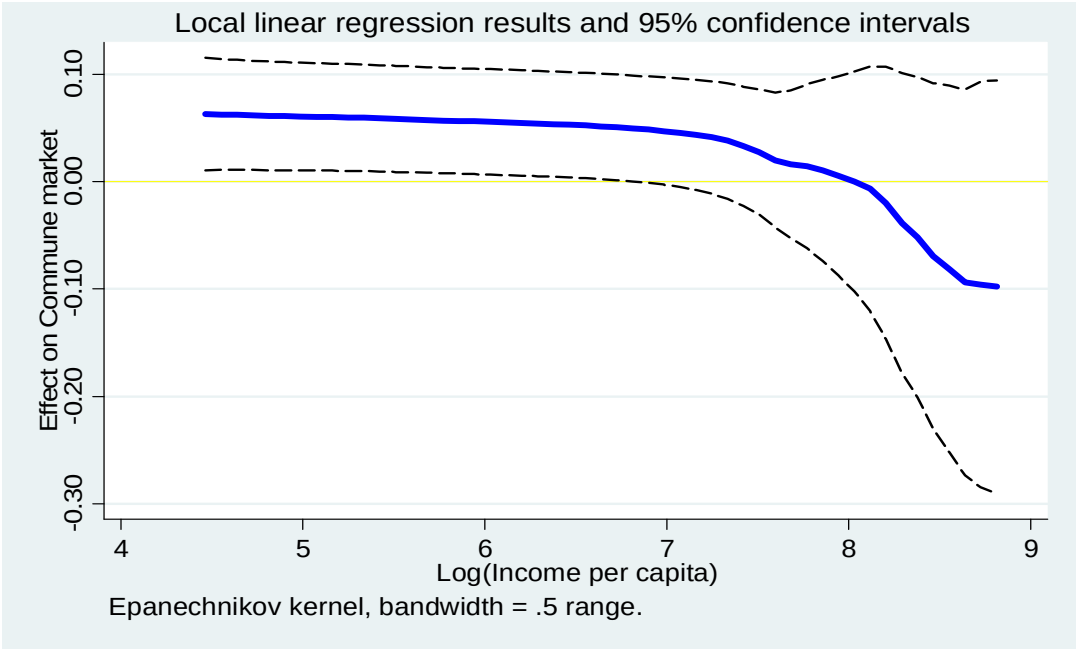
Note: This figure illustrates Propositions 1 to 3. Two key functions of the favored allocation B, namely the positive and negative parts in equation (2), are represented by a downward sloping marginal benefit curve and an upward sloping "pseudo-marginal" cost curve . The two must intersect at the unique solution B*. An increase in r or d raises the pseudo-marginal cost curve, thus reduces B* to B1. On the other hand, an increase in either political or social payoff pushes the marginal benefit curve up, and moves B* to B2.

Figure 2: Effects of a native official's new promotion by commune per capita income in 2002

Panel A. Effect on village road, plotted by income per capita



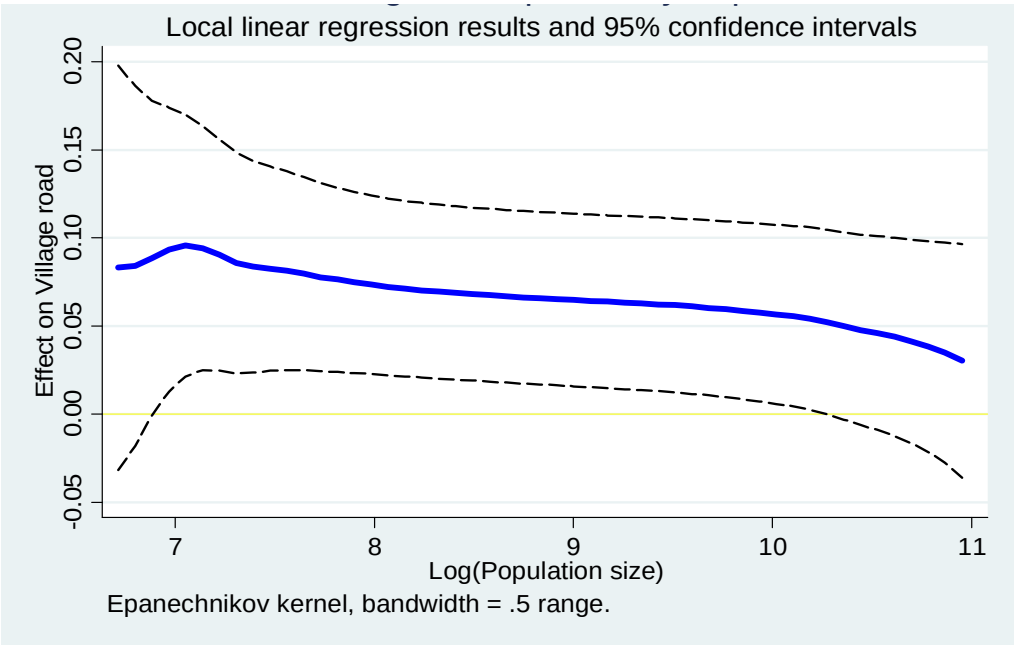
Panel B. Effect on marketplace, plotted by income per capita



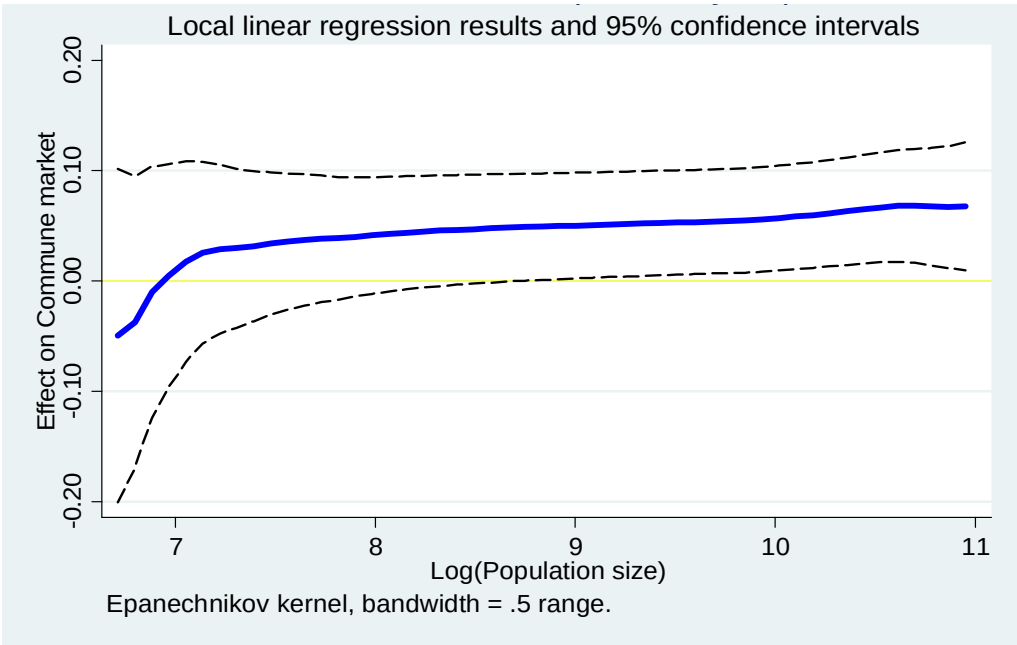
Note: These graphs show the effects of a native official's new promotion on Good road and marketplace - by commune average income in 2002 from non-parametric regression, excluding from the sample communes already having the public service (good village road or market place) throughout the period.

Figure 3: Effects of a native official's new promotion by commune population in 2002

Panel A. Effect on village road, plotted by population size



Panel B. Effect on marketplace, plotted by population size



Note: These graphs show the effects of a native official's new promotion on good village road and marketplace - by commune population in 2002 from non-parametric regression, excluding from the sample communes already having the public service (good village road or marketplace) throughout the period.

Vote Suppression and Insecure Property Rights

Paul Castañeda Dower
New Economic School
pdower@nes.ru
Office 1901, 47 Nachimovsky Prospekt, Moscow 117418, Russian Federation
Tobias Pfutze
Oberlin College
tpfutze@oberlin.edu
10 N. Professor St., Rice Hall 233, Oberlin, OH 44074, USA

January 6, 2013 – Version 1.0

Abstract

While it is commonly understood that land is a political tool, there is surprisingly little research on how improvements in land tenure security, such as land certification, affect political outcomes. In this paper, we show how a dominant political party can use insecure property rights to ensure politically compliant voter behavior and how this power is frustrated after the introduction of a land certification program. Without the ability to expropriate land, the party will no longer be able to threaten the opposition to stay away from the ballot box. We test our hypothesis using data on 10,000 Mexican municipal elections during the country's democratic transition. Exploiting the data's panel structure, we find that a large scale land certification program that ran in parallel during 1993-2007 had the effect of significantly raising turnout for the opposition to the former state party (PRI). Importantly, this effect disappears once the PRI has already lost at least one election in the municipality. We interpret these results as land certification limiting PRI's clientelistic powers. With these results, we contribute to the understanding of the downfall of PRI and, more generally, to the relationship between political power, institutions and resource allocation.

JEL Classification: D73, O12, Q15
Keywords: Property rights, Clientelism, Land reform, Mexico, PRI, Ejido

1 Introduction

One common feature observed in developing countries is the insecurity of property rights. Economists argue that insecure property rights inhibit economic development and often stress how improvements in property rights can lead to economic growth. However, most of the well-known effects, such as increased investment incentives or better access to markets, completely abstract from the underlying political process that gives rise to the insecure property rights in the first place. In particular, economists have given little attention to the interaction between insecure property rights and another commonly observed feature of developing countries, political clientelism. In this paper, we study the effect of land tenure security on the ability of political parties to engage in clientelism with the electorate.

Insecure property rights over some asset, by default, gives some discretionary control over its redistribution by whomever holds political power. This power, in turn, can transform land into an instrument of political control by using the expropriation of land to either reward or punish desirable political behavior, further reinforcing the position of the political party. Improvements in property rights such as land certification programs weaken this discretionary power and hence frustrate the clientelistic function of land. Using data on over 10,000 municipal elections in Mexico over the 1990s and early 2000s, we find extremely robust support for the hypothesis that land certification played a large role in reducing the clientelistic powers of the dominant political power, the *Institutional Revolutionary Party* (PRI).

Although there is a rich literature on clientelism and redistributive politics, to our knowledge, the exact nature of this economic problem that the dominant party and

the individual voter face has not received attention. As such, we formalize our logic by building a standard voting model that incorporates the use of a discretionary asset to influence individual voter behavior. The most common and politically sensitive such asset is, of course, land. We will, therefore, repeatedly refer to land rights as the concrete case since our empirical analysis focuses on the effect of land titles in Mexico. But one could alternatively apply the analysis to assets such as housing, employment or businesses. In this sense, we follow Stokes (2009)'s broad definition of clientelism as "The proffering of material goods in return for electoral support, where the criterion of distribution that the patron uses is simply: did you (will you) support me?". We show that following an initial redistribution of land to garner electoral support, land is effectively used only as a credible threat in the case of non-compliant behavior of opposition supporters. Introducing secure property rights shuts off this simple yet powerful clientelistic tool and electoral support for the opposition increases.

One explanation for the lack of research on this topic is that data are difficult to obtain on both ends, changes in property rights are rare as are adequate measures of clientelistic transfers. For changes in property rights, we take advantage of a large-scale land-titling program designed to formally document the country's communal land holdings (*ejido*). We use an indirect measure of clientelistic transfers, arguing that in Mexico we can credibly use voting outcomes to infer clientelistic behavior in the rural sector. Figure 1 shows that the electoral support for PRI in local elections declined rapidly over the period of 1990-2007. This pattern demonstrates that two important features of the demise of PRI. First, much of this dramatic decline occurred before the presidential election in 2000 (in which PRI lost power at the federal level)

but decline still gradually occurred after the election. Second, despite the loss of power, PRI still controlled 50% of the vote in local elections in 2007.

Figure 1 here.

A negative effect of Mexico's land certification program, PROCEDE, occurring from 1993-2007, on PRI's clientelistic powers fits this data well. Over 50% of Mexico's agricultural land is controlled by the ejido sector. Ejido leaders often function as local power brokers who enforce clientelistic arrangements (Magaloni 2006). These leaders could exercise some discretionary control over ejido members' claims to the ejido's lands. When land certification occurs, the threat of land expropriation by these leaders becomes much more costly. A key result of our model states that land certification should have a larger impact on those voters whose votes were suppressed by threat of land expropriation. Consistent with this result, figure 2 demonstrates that that the fall in the share of votes for PRI mostly comes from greater electoral support for the opposition and not from the fall in voter turnout for PRI. With these descriptive patterns as our starting point, we will investigate the clientelistic nature of land in a rigorous manner.

Figure 2 here.

Using data on every single ejido and municipality in Mexico during the period of 1990-2007, we are able to test this vote suppression prediction. We find that, due to land certification, the probability of PRI winning a local election decreases by up to 15%. We identify the causal role of property rights by combining panel data and IV methods. This loss is due to more votes for the opposition, arising from a higher turnout for the locally strongest opposition party to the PRI and not from less votes

for PRI itself. Importantly, this effect can only be observed for municipalities where the PRI has been continuously in power. Once an opposition party wins an election there is no longer an appreciable effect of the program on PRI's electoral fortunes.

The paper proceeds in the following way. First, we discuss the relevant literature on clientelism and land and power. Next, we present the model of clientelism that incorporates the possible transfer of a discretionary asset to the individual voter. We then discuss the Mexican context in detail and show that the stylized facts are conform to the main assumptions of the model. The next section presents the data and empirical methodology, including the instrumental variable that we employ. An analysis of the empirical results follows and finally we conclude.

2 Literature Review

As far back as Malthus and Ricardo, scholars of political economy have been concerned with land as a political tool. Land reform has been linked to political incentives in many countries. Bardhan and Mookherjee (2010) argue re-election concerns drive land reform in India. Albertus and Kaplan (2011) suggest that concerns about violent conflicts drive land reform in Colombia. Land reform can also change voters' preferences according to investor class theory, making voters more conservative (Nadler 2000). Both DiTella, Galiani, and Schargrodsky (2007) and deJanvry, Gonzalez-Navarro, and Sadoulet (2011) argue that this is the case for Argentina and Mexico, respectively. This latter paper is of particular interest for us because they use the same variable of interest only for a different outcome (congressional

elections).

In general, insecure property rights can increase rent-seeking (Sonin 2003, Keefer and Knack 2002, Baland and Robinson 2008), further entrenching the elite's desire to remain in power. Scholars such as Engerman and Sokoloff (1997) argue, more broadly, that land can also play a role in determining which political institutions take hold. In fact, a central question in political economy is how resource allocation influences the distribution and persistence of power. We show that the threat of expropriation in land can manipulate electoral support. Moreover, this threat is near costless for the political party in power. Thus, insecure property rights benefit those in power even when the assets in question are of little value to those in power and democratic institutions exist.

The literature on clientelism exists both in political science and political economy literatures. While vote-buying is attractive in competitive elections, the benefits are less clear in autocratic regimes. However, there is a literature on hegemonic party survival that places an importance on electoral support (Magaloni 2006). In our context, political support is maintained using clientelistic networks. Larreguy (2012) presents evidence that in areas where voting behavior is more easily monitored and, hence, clientelistic networks are easier to maintain, voter support for PRI is higher.

Vote-buying theory classifies several different types of vote-buying (Nichter 2008). In the standard model, political parties target "swing constituencies" (Lindbeck and Weibull 2003, Dixit and Londregan 1996). Another strand of literature looks at discretionary transfers. Diaz-Cayeros, Magaloni, and Weingast (2006), looking at the Mexican case, show that revenue sharing can lead to clientelistic transfers. Alesina,

Baqir, and Easterly (2000) argues that when direct transfers are politically costly, distributing public employment is an alternative. Finally, Albertus (forthcoming) applies the standard model to investigate whether land transfers target swing voters.

In all clientelistic literature, there is a commitment problem, either on behalf of the voter or the political party (Stokes 2009, Keefer and Vlaicu 2005). Albertus (forthcoming) argues that irreversible transfers are used to target swing voters because they do not suffer from the commitment problem whereas public projects go to core voters because there is a long-term relationship. In our model, discretionary assets can be used as a clientelistic transfer only if the party can credibly threat to expropriate it, something it can not do once elections become competitive.

3 Model

In this section, we develop a standard voting model modified to allow for clientelistic transfers of land. It is well-known that clientelistic transfers suffer from commitment problems. The transfer of land involves an additional commitment problem due to prohibitive costs of certain types of land transfers. We assume that the dominant party can commit to redistribute land as long as three conditions hold: 1) Elections are not competitive in the sense that the opposition has never won in previous elections; 2) Land tenure insecurity makes possible discretionary, small-scale land transfers (costly large-scale redistribution of land is not necessary); and 3) Local power brokers exist to enforce the land transfers (squatting on expropriated land is difficult to observe without these local actors) .

Assuming these conditions hold, the government's problem is, given an initial land distribution and a distribution of voter preferences, how should land redistribution occur such that the new allocation of land and individual-specific clientelistic arrangements generate the maximum margin of victory. The following subsection describes this problem explicitly.

3.1 Model Setup

We assume that two parties are exogenously located in a one-dimensional policy space over the interval $[0, 1]$. The two parties are defined to be the governing party, given by the fixed policy position, x^G, and the opposition given by x^O. Without loss of generality, we assume $x^O > x^G$. Voters are distributed uniformly over this space and are defined by their preferred policy position $x_i \in [0, 1]$. Each voter's ideological position x_i is observable to the government and the government is able to observe who turns out to vote; however, there is ballot secrecy and government can not observe who the voters vote for.

The governing party's interest is to maximize the winning margin. Let σ_j denote the share of votes going to party j. Either share can be manipulated by the government using land transfers. The incumbent has access to a pool of land which can be initially be distributed, denoted by Δl_i, to alter the initial distribution of land, denoted by $\hat{l}$. The existence of an asset with insecure property rights allows the government to exercise its clientelistic powers in two different ways: i) it can influence voters' preferences in its own favor, and ii) it can threaten voters that have received and asset transfer with expropriation in order to elicit compliant behavior. Utility

from voting for party j consists of the ideological position of voter i vis-a-vis party j and additively the asset transfer received (which will be equal to zero if $j = O$ and henceforth we will drop these transfers from the analysis):

$$U(v = j) = b - |x_i - x^j| + \alpha \Delta l_i,$$

where only G can redistribute the asset and the utility from abstention is normalized to zero. The parameter $0 \leq \alpha \leq 1$ captures the idea that voter i's preference is influenced by receiving an asset, but that this effect is less than the actual value of the asset itself. The bold lines in figure (3) show the initial utility of voting for G of voter i. We will refer to this graph when discussing G's margin maximizing strategy.

The land transfer is a conditional transfer that can be expropriated if the individual does not comply with the clientelistic arrangement. If this asset were to come with enforceable property rights, the government would not be able to take it away at will. Later in this subsection, we will discuss what happens when an exogenous land certification program introduces enforceable property rights for all landholders and thus shuts off the threat of expropriation. Notice that some voters will be induced to vote while others will be expected to not vote. Following roughly (Nichter 2008), we discuss three different strategies "Turnout Buying", "Vote Buying" and "Negative Turnout Buying". This last strategy being the one that gives the vote suppression result. The government will either do nothing or make use of one of these strategies, which we denote by V_i.

The conditions for these strategies to work are the following. For (negative) turnout buying the government only has to make sure that the allotted asset is big

enough to compensate the voter for the loss in utility from (not) voting. That is:

$\Delta l_i \geq b - |x_i - x^G| + \alpha \Delta l_i$ for turnout buying. $\Delta l_i \geq b - |x_i - x^O|$ for negative turnout buying.

For vote buying, the transfer has to be big enough to change the voter's political preference or to elicit her to vote, whichever is bigger:

$b - |x_i - x^G| + \alpha \Delta l_i \geq b - |x_i - x^O|$ AND $b - |x_i - x^G| + \alpha \Delta l_i \geq 0$

Assuming a binding budget constraint for the government (i.e. the total amount of the asset that can be distributed is limited) there will be some maximum transfer, l^{max}, it is able to pay. The government will not engage in clientelism with voters with a required transfer payment above that level.

Given this set-up, the government's strategy for a particular voter i can be fully described by $T(x_i) = \{\Delta l_i, V_i\}$. The model is essentially static and deterministic. From the point of view of the government, all the action is in the initial redistribution. The government's problem is then to choose T_i $\forall i$ to maximize the following:

$$\max \sigma_G(\mathbf{T}) - \sigma_O(\mathbf{T}) \text{ s.t.}$$

$$\Delta l_i > -\hat{l} \tag{1}$$

$$\Delta l_i \leq l^{max} \tag{2}$$

where $\mathbf{T}$ is a vector of individual menus of land transfers.

Figure 3 about here

3.2 Analysis

The government decides about how to initially redistribute land. First, the government has no interest in redistributing the asset to any voter who would vote for it anyway. These voters have an x_i such that they would receive positive utility from voting for G, and belong from some point up to the indifferent voter. Voters located further to the left need to be induced to turn out to vote for G either by increasing their utility so far that they will do so voluntarily, or by giving them enough of the asset so that the threat of a loss is big enough to have them turn out to vote. In the latter case the government can be assured that the vote will be in its favor given the ideological preferences of the voter. For voters to the right of the indifferent one, the government has the same two options, it can either give them enough of the asset so that they will prefer party G to party O, or, alternatively, it can give them the asset only to threaten expropriation. In the second case, the government would demand abstention as the compliant political behavior, given that it cannot control the actual vote being cast. Note that in the former case the voting margin would increase by two votes, while in the latter it would do so only by one. Lastly, to the very right of the diagram we have voters who would prefer party O to G, but are so far removed from either that they would not bother to turn out to vote. Here the government only has the expensive option of vote buying.

Given the voters' utility function, it can easily be shown that for voters with very low x_i the government would only transfer small amounts of assets and threaten expropriation in case of abstention. For voters who would vote for O, but are very close to the indifferent voter it would switch their votes by means of a transfer. This

result is consistent with Albertus (forthcoming) but for a different reason since these transfers are reversible. But since the cost of actual vote buying increases quickly relative to negative turnout buying, this group will be relatively small.

Table (1) shows the necessary transfer payments, T, necessary to increase the voting margin by one vote implied by this model. One can see immediately that which strategy the government will pursue depends upon the parameters. However some generalizations can be made. First, unless G is close to the median (unlikely for a hegemonic party) or b is very small, turnout buying is a little used strategy. If $b \geq x^G$ it would disappear completely. Second, unless the policy positions of G and O are relatively close (unlikely for an opposition party under an autocratic regime), negative turnout buying will be the preferred strategy except for a few swing voters. Even for the limiting case of $\alpha = 1$, as long as $b \leq \frac{x^O - x^G}{2}$ at least the same number of voters will be subject to negative turnout buying as to vote buying.

Figure (4) shows these transfers graphically as a function of x_i, under the assumption that $\alpha = 0.5$. The darkly shaded area to the right corresponds to turnout buying from voter ideologically close to G, but who would not turn out in the absence of the transfer. The lightly shaded area shows voters whose votes are switched in favor of G, and the two intermediately shaded areas show the extend of negative turnout buying. In figure (3), the dotted lines show how the utility from voting for G is affected by these transfers (the utility from voting for O is unaffected).

Figure 4 about here

We now turn to what happens when land certification is imposed by the central government. The unexpected imposition of secure tenure over previously acquired

assets therefore will significantly increase turnout for the opposition party because the threat of expropriation no longer can keep them away from the ballot box. Land certification should also, ceteris paribus, decrease somewhat the turnout for the government since some of the abstainers have been threatened to show up to vote. The most singular case perhaps is those voters whose preferences will have switched towards the government permanently. Land certification will have no effect on them.

3.3 Discussion

The main testable implication is that land certification shuts down any threat of land expropriation by the local power brokers. Without this threat, the clientelistic networks are harder to maintain and the incumbent government should lose some political power. However, we believe we can make a stronger empirical claim based on the model. First, the parameter values that would make the group targeted by the turnout buying strategy large in size are not very realistic in the dominant party set-up. Second, after land certification, the freed up funds for costly land transfers could funnel into monetary transfers or other types of transfers. Since the voters targeted by turnout buying are exactly those who are cheapest to influence, these other transfers would lessen the impact of land certification on these voters. Third, this simple model did not fully exploit several characteristics of land that under certain institutional environments might matter, such as the spatial nature of land. We have assumed that the distribution of voter preferences is independent of the initial land distribution. When this is not the case, the use of land transfers as a clientelistic transfer may be even more restricted. For example, if these two distributions are

positively correlated, it will be too costly for the political party to make certain redistributive transfers that occur in the model above. We speculate that this will only work to strengthen the vote suppression prediction since threatening to expropriate the initial distribution of land may be the only effective strategy.

Important for understanding how our model relates to the empirical analysis is the fact that the government party acts through local power brokers. The central government delegates the authority to oversee discretionary transfers. Thus, the central government is, in reality, in the background of the analysis and land transfers happen locally. Given the result of the model, why would the governing party at the federal level ever implement land certification? There are several reasons but all of them, of course, are outside the domain of the model since land certification is exogenously implemented. The first is a simple cost-benefit calculation. The federal level may view land certification as a benefit to voters and hope that the program will improve its chances of winning at the federal level, even at the expense of losing at the local level. In a power-driven, hierarchical system, the federal level is the most important to maintain. The second is based on imperfect information. Given the history of vote suppression and the information asymmetries between the local and federal levels, local officials could misrepresent the size of the opposition to the federal level especially if the federal level rewards them for core supporters.

4 The Mexican Context

Mexico combines two important characteristics that make it an ideal case to study the effect of property rights on clientelism. Starting in 1993, following a constitutional amendment governing communally held land the previous year, the country carried out a large scale land titling program which only concluded in 2007. Importantly, the titles awarded did not constitute an outright privatization of the land, but only made existing land rights enforceable by a third party. In parallel, Mexico went through an important democratization process that culminated in the year 2000 with the defeat of the dominant PRI candidate in a presidential election for the first time in more than 70 years. It is commonly recognized that one of the principal factors in the PRI's demise can be found in its waning clientelistic powers (e.g. Klesner and Lawson (2001)). The task at hand is therefore to show how changes in land tenure security contributed to this process.

Born in 1929 as a result of the Mexican Revolution, the PRI quickly established itself as the country's de-facto state party. For sixty years it controlled practically every electoral office in the country, and won them with overwhelming electoral majorities. Only in 1989 did it lose an election for state governor for the first time. At the municipal level, the PRI's dominance was equally crushing. According to Krauze (1997), between 1946 and 1970 it lost less than 40 out of more than 27,000 mayoral elections. According to our own data, in 1990, at the beginning of our analysis, less than 10% of municipalities ever have be governed by some other party than the PRI. Around the year 2000, this number has decreased to around 50% and almost 40% of elections were won by other parties (see tables (2) and (3)). It would

be wrong, however, to assume that the PRI's dominant position ended with the 2000 presidential elections at every level of government. The data used in this paper show that even during the first decade of the 2000s it continued to win more than half of all electoral contests at the municipal level, and that in the second half of the decade one quarter of all towns had not been governed by any other party. Many authors, furthermore, argue that the PRI was able to perpetuate its old power structures at the municipal level, or even created new ones (Lawson (2000), Bizberg (2003), Snyder (1999)).

Despite its dominant position, the PRI conducted elections at all levels of government, that were contested by at least one opposition party, on a rigid schedule. Mexico was by no means the only country to combine an autocratic system with the appearance of democratic elections, but due to the system's longevity it became an ideal setting to study the workings of what is called an "electoral authoritarianism" (Magaloni 2006) or "dominant party system" (Greene 2007). The first author lists four reasons why authoritarian parties would hold elections at all. These are: i) As a method to share power within the ruling elite, ii) to disseminate public information about the regime's strength, iii) to provide information about supporters and opponents of the regime, and iv) to give the opposition a non-violent means to oppose the regime (Magaloni 2006). Another notable feature of such systems is that they strive to win elections by overwhelming majorities (i.e. to maximize the winning margin), and that they need to co-opt large parts of the electorate through patronage and/or repression (Greene 2007) in order to sustain such majorities. Outright electoral fraud, however, is a rather rare occurrence (Greene 2007). Diaz-Cayeros, Magaloni,

and Weingast (2006) analyze how a dominant party can maintain large majorities by means of patronage and credible threats of punishment, and show that the PRI's allocation of funds to municipal governments largely followed this strategy. Diaz-Cayeros and Magaloni (2003) show a similar result for projects awarded through a community based, but federally administered, public works program (PRONASOL) in the early 1990s.

Mexico has two types of communal land holdings. The first and most important one, being the subject of the 1992 land reform, consists of 29,259 *ejidos* that together cover more than 50% of the country's territory. The second sector, consisting of 2,334 *comunidades agrarias*, entered the land certification program only in 1998. But as all its land is communally held, their members did not receive any individual titles (Appendini 2010).

The ejido is one of the most significant results of Mexico's 1910 revolution. The country's Constitution of 1917 in its article 27 granted, until its reform in 1992, the government the right to expropriate and redistribute land in favor of the landless population. The corresponding Agricultural Law (*Ley Agraria*), furthermore, outlaws landholdings in excess of 100 hectares of irrigated land or its equivalent in land of lesser quality. In order to be given land, communities of at least 20 landless (or extremely land poor) peasants had to petition the government. If granted, the petitioners were to form an ejido. Part of the ejido land was given to its members, the *ejidatarios* (of which there are roughly 3.5m), as individual plots over which they held hereditary usage rights. Under the pre-reform law, this land could not be left without cultivation for more than two years, could not be sold nor rented, and had

to be cultivated by the person to who the usage right was given. However, these rights were not properly documented which made them not enforceable by a third party (see (Sanderson 1984) for a detailed history of the Mexican ejido).

As a result, the local ejido leaders (*comisariado ejidal*) held considerable power over the allocation of usage rights. There exists a rich qualitative literature that illustrates how these these local strongmen (*caciques*) acted as local power brokers for the PRI (Roniger (1987), Holzner (2003), Paré (1975)). They were given the discretionary power to wield carrots and sticks in order to ensure political compliance with the state party. Mackinlay and Otero (2004) argue that *"Among others, their task was to administer the resources and social welfare programmes that were channeled through the Ejido Commissariats"* (pg.80). Martínez-Vázquez (1975) documents how unconditional support for the PRI was a precondition to be recognized as an ejido member, and how the ejido commissariats used their discretionary power to grant and take away individual plots in order to maintain that support. In many cases, *caciques* were able to enrich themselves by redistributing land in their favor (Martínez-Vázquez 1975), or by controlling local commerce vital to farmers (Roniger 1987). In this context, McKinley-Grohmann (2011) provides a detailed account how the *Confederación Nacional Campesina* (CNC), an organization affiliated with the PRI, acted as a conduit between the state party and the *caciques*. The same author also argues that ejido leaders had considerable scope in reassigning land rights.

The ejido sector has been consistently plagued by low agricultural productivity and persistently high poverty, which was seen as a consequence of the small size of

plots and the low levels of capitalization (Cornelius and Myhre 1998). In response, the market friendly Salinas administration (1988-1994) passed the 1992 constitutional change in the hope of ushering in a process of rapid modernization, consisting of land consolidation and investment. Among some other changes, the reform did away with the cultivation requirement, allowed for land to be rented out, to hire labor for its cultivation, and it gave individual ejidatarios titles over their usage rights through a large scale certification program (*Procede*). It also opened the door for land to be privatized if the ejido assembly approved of it with a two-thirds majority. While this last option is contingent upon having concluded the certification process, all other legal changes took effect immediately and prior to any land titles being handed out. Obtaining such a title, therefore, only changes tenure security (i.e, it makes land rights enforceable by a third party), but does not effectively change control rights over land.

Procede was a largely voluntary process, carried out jointly by three government agencies: the National Statistical Institute (*INEGI*), the National Agrarian Registry (*RAN*), and the *Procuraduría Agraria* (PA, the federal government's arbitration body for rural conflicts). The process was initiated by the PA with a first informational meeting (*Asamblea de Informació y Anuencia*). It was followed by a three step process in which the land was measured out and maps were created by INEGI officials. The results in each step had to be approved by the ejido assembly, and the final results were transferred to the RAN, which issued the land titles.

The voluntary nature of this process meant, of course, that the timing of certification depended to a large extent on ejido characteristics. Furthermore, in order

to be certified by Procede, ejidos had to resolve first all internal and external land conflicts. A last factor that affected the timing of the process resided in the program's own budget constraints. The process proved to be much more drawn out than originally expected and the change in the administration in 1994 and the subsequent currency crisis severely curtailed the funds available. At the same time, the agencies involved in the program faced strong political pressure to produce results as quickly as possible. The optimal response was to pick the low hanging fruits first in order to quickly certify the largest numbers of ejidos possible. In our own conversation with officials at INEGI who were actively involved in Procede, we were told that the criteria for early certification were that ejidos had a small land area, a leveled terrain and/or shared boundaries with other ejidos already certified. Teams of officials were assigned to individual states and were based in their respective capitals. The date an ejido was certified, once it had approved of the process and had solved its land conflicts, therefore depended on its position relative to their ejidos in its state.

It has to be kept in mind that the reform was entirely the result of decisions taken at the federal level, with no official input from lower tiers of government. As pointed out by Cornelius and Myhre (1998), the reform was mostly driven by modernizing technocrats within the administration, whose principal aim was to recapitalize the sector and increase its export potential in the context of the just negotiated North American Free Trade Agreement (NAFTA). Another faction within the government (dubbed *Campesinistas* by the authors) explicitly *"saw its mission as that of transforming the ejido from a mere instrument of political control into a vehicle for autonomous expression of peasants' needs and democratic participation"* (Cor-

nelius and Myhre (1998), page 4). In short, there is no evidence that the reform's architects took the potential negative effects on the ruling party's clientelistic potential into account. That said, deJanvry, Gonzalez-Navarro, and Sadoulet (2011) hypothesize that the government may have hoped that peasants would reward the PRI at the ballot box for a popular reform. In any case, it seems safe to assume that the reform's effects on municipal elections were not a big concern to its creators, given the PRI's crumbling patronage machine, its recent division, that a large part of the ejido sector sympathized with the newly formed left-wing PRD, and the fact that Mexico was already a very urbanized country.

5 Data

Our data come from three principal sources: All data on electoral outcomes are taken from the database on municipal elections maintained by the Mexico City think tank CIDAC [1]. This data is publicly accessible and contains results of all municipal elections in Mexico since 1980. The data on ejido certification was given to us by the Mexican National Agrarian Registry (*RAN*, by its Spanish acronym), and consists of the exact dates land titles were issued for each ejido. Lastly, data on population were taken from the Mexican censuses and mini censuses (*Conteos*) over the time period 1990-2010. As in the United States, Mexico conducts a general census at the start of every decade. In addition, it also conducts a mini census at mid-decade (i.e. in years ending in five). The difference between the general census and the mini-census resides in the number of characteristics captured, as both are administered to the

[1] www.cidac.org

entire population.

Data on the total population are therefore available every five years (1990, 1995, 2000, 2005, and 2010). In order to fill in the for the years in between, we assumed a constant growth rate over the five yearly period between censuses. Of particular interest here is of course the total population of voting age, that is of 18 years and older. Mexico does require voters to register and the Federal Electoral Institute (*IFE*) issues a national voter ID that has to be presented at the polling stations. The state level electoral institutes, while in charge of all elections below the federal level, do not require a separate registration. Alas, while data on registered voters does exist at the municipal level, we prefer to use data on the population of voting age for a number of reasons.

First and foremost, the national voter ID only became mandatory voter identification in 1997, after a couple of years of initial roll-out. Reliable data are therefore only available from 1997 onwards. Secondly, after its introduction, the voter ID became very quickly a de-facto national identification card, similar to the role of driver licenses in the U.S., necessary for all kinds of daily transactions. As a result, its adoption has become almost universal. This implies that practically the entire adult population in each municipality can be expected to be a registered voter, allaying concerns that the population 18 years of age or older may substantially overestimate the actual size of the electorate. But, on the other hand, this also means that many people do not bother to change their registration when they move, which adds an additional concern about using voter registry data. In fact, one of the authors (Pfutze (2012)) found in a different paper that for the period 2000-2002, the municipal pop-

ulation of 18 years of age or older tracked the voter registry data very closely once the latter was adjusted for international emigration.

Municipalities are Mexico's lowest political and administrative units. And even though municipal elections are administered at the state level, the practical differences between states are minor. In all states voters cast one single ballot for a party or coalition of parties. The party gaining a plurality of votes in its favor gains the mayor's office, as well as, a majority in the local council. We are interested in four different outcomes. The first is the binary outcome whether or not the formerly dominant state party PRI wins a municipal election. The second is total electoral participation, and the third and fourth are turnout for the PRI and its locally strongest opponent, respectively. For the latter two,"turnout" refers to the total number of votes cast in favor of the respective party divided by the total population of voting age. We only focus on the locally strongest opponent for two reasons. The first one is strategic: In accordance with our model presented above (which explicitly assumes the existence of only two parties), the dominant party cares only about its winning margin with respect to its closest opponent. Votes cast for also-rans are therefore of no strategic importance and can be excluded from the analysis. The second reason is that in Mexico most elections are competitive between only two parties. These are almost always the PRI, which to this day is the only party that is competitive in all regions, the PAN in most of the north, west and some regions in the center, and the PRD in the south, east and some other regions in the center. In a few cases, some other party may be the PRI's principal opponent at the municipal level. Competitive three way races are extremely rare, however. This pattern was all the

more pronounced during the 1990s, which constitute the largest share in our data, a time when the PRI started to face strong competitors at the sub-national level.

As far as independent variables are concerned, our variable of interest is the proportion of certified ejidos in each election year (*Procede*), which is directly computed from the data provided by the National Agrarian Registry. Our identification strategy, explained below, requires to interact this treatment variable with an indicator whether or not a municipality has been continuously ruled by the PRI since 1980 (*PRI Only*), which almost certainly implies that it has been ruled by it since the 1930s.

We will be estimating a very parsimonious model without many control variables. The reason is that we believe that the effect of almost any variable potentially of interest would be differenced away in our empirical strategy described below. Most such variables are only observable every ten years in the general census. Assuming a constant growth rate over the course of the decade will not allow for sufficient variance in the differenced data. The only control variables included are derived from the population data described before, which is available every five years, plus a measure of municipal finances, which is available yearly.

The population controls are the size of the electorate (i.e. the population 18 years of age or older), proportion of new voters (i.e. who turned 18 since the last election) in the total population of voting age, and the proportion of female voters in that population. These are meant to control for the most important demographic changes. The total size of the electorate can be expected to closely track the total population, while the proportion of new voters and the proportion female should be a good proxy

for the intensity of international migration (for which data is only available for the year 2000). We control for municipal finances by including a measure for municipal revenue (*Revenue*), which consists of transfers from the federal and state level, as well as, municipal taxes and may act as an omitted variable. For one, higher municipal revenue should bolster the party in government, but, at the same time, land titling could increase local tax collection (by adding new dwellings to the registry and by potentially increasing incomes), or transfers could increase to make up for the loss in clientelistic control.

For our instrumental variable strategy, we use a similar instrument as in deJanvry, Gonzalez-Navarro, and Sadoulet (2011). The *Procuraduría Agraria* provided us with the dates of the first informational meetings that it carried out in each ejido in order to initiate the certification process. In our personal conversation with officials at the agency, we were assured that the order of these meetings followed no particular strategy in response to ejido characteristics. Agency employees were simply moving from one ejido to the next, possibly creating a spatial pattern and moving into more remote regions at a later date. This is partly confirmed by the results in table (4), explained below. Our instrument, therefore, corresponds closely to the variable it is meant to instrument for. Instead of the proportion of ejidos per municipality certified, it measures the proportion of ejidos that had had the first informational meeting by the end of the year prior the the election.

Lastly, it is important to note that municipal elections in Mexico take place every three years, but the precise year depends on the state. We therefore include a set of year specific dummy variable, plus another pair dummy variable in order

to control for the electoral schedule each state is on. Tables (2) and (3) shows summary statistics for all our variables with exception of the dummy variables just described. Since each municipality holds elections roughly every three years, we are able to observe 6 elections in each municipality over the period 1990-2007 (with the exception of the state of Yucatan for which we observe 7 elections due to one shorter interval between elections). The table presents the summary statistics for the total average and for each electoral cycle separately.

We have consistent data on roughly 1,750 municipalities. This somewhat lower number than the current total (close to 2,500) stems from the fact that we excluded municipalities not yet formed in 1990, and those that opted for a non-party based local administration based on traditional institutions (*usos y costumbres*). There are close to 500 such municipalities, mostly in the southern state of Oaxaca. Lastly, we excluded the 16 boroughs (*delegaciones*) that make up the Federal District of Mexico City and excluded those municipalities that have an interrupted record of elections, which may be the case due to annulled elections or coding errors.

When interpreting the numbers in tables (2) and (3), it has to be kept in mind that these are not national averages, but rather representative of the average, unweighted, municipality. Nonetheless, some important trends can be spotted. The proportion of elections won by the PRI during the period under study decreased from more than 90% to little more than one half. The mirror image of this trend is that the proportion of municipalities that have never seen a different local government decreased from 90% in 1990 to 25% in 2007. Looking at turnout, it becomes clear that total participation has steadily increased. This trend appears to be mostly

driven by the increase in turnout for the major opposition party, while, at the same time, turnout for the PRI decreased slightly. This can also be appreciated visually in figure (2). The average number of opposition victories since 1980 prior to each election (*OPP. Wins*), which will be used in the robustness checks section, increased from a negligible 0.04 to 1.2.

The proportion of certified ejidos naturally increases over time from zero during the first round of elections to more than 90% in 2007. The total population of 18 years of age or older (*Total Voters*) increased from an average of 21,456 to 31,937 over the period under study. When interpreting the results it has therefore to be kept in mind that the average municipality is a fairly rural place, where peasants and their dependents form a large part of the electorate. New voters make up a non-negligible proportion of the total electorate (around 10%), with a slightly decreasing trend over time. The proportion of females is, as would be expected, around 50% on average. Municipal revenue per capita increases consistently from 9.2 Pesos (at 2010 prices) to more than 30 Pesos. These number are strikingly low, and the data on municipal finances needs to be taken with a huge grain of salt as it is likely to come with a large measurement error and underreporting.

Finally, our instrument leads the variable on certification substantially. The pattern between the two is, however, quite similar. The biggest increases occurred during the 1990s and tapered off during the 2000s. Table (4) asserts that the rollout of the first informational meeting was largely uncorrelated with municipal baseline characteristics in the early 1990s. These characteristics are our outcome variables during the first electoral cycle under study (prior to the reform), a number of municipality

level fixed characteristics, a battery of socioeconomic characteristics, and a number of characteristics for the ejido sector. In the table, the first column shows results for a regression of the mean value of the instrument across all electoral cycles on the baseline variables. As suspected, variables that are associated with a higher degree of isolation, such as euclidean distance to the closest city with more than 100,000 inhabitants (*Distance City*), or a measure of the ruggedness of a municipality's territory, are associated with a later date of the informational meeting. Most of the other significant regressors, the proportion of the population speaking an indigenous language, and the illiteracy and unemployment rates (also measured as proportions), can also be interpreted as acting as proxies for geographic isolation. The only significant outcome variable from the 1990-92 electoral cycle is turnout for the biggest opposition party. The binary variables indicating the actual election year during the first electoral cycle (*Elections in 90/91*) essentially proxy for certain groups of states that move faster through the process. We would expect none of these characteristics to have a significant effect in first differences with and without fixed effects. The following five columns regress the change in the instrument (i.e. the variable used in the first differenced model) in each electoral cycle on the same baseline variables. A later meeting would mean a larger difference in a later cycle. Therefore, some of the variables associated with geographic isolation exert some effect in a few periods. More importantly, none of the baseline electoral results has any consistent effect (out of 25 estimated parameters, one is significant at the 5% and one at the 10% levels).

(Table (2) about here)

(Table (3) about here)

(Table (4) about here)

6 Estimation Strategy

Our aim is to estimate the causal effect of land certification through Procede on different electoral outcomes. These are, a PRI victory, total participation and turnout for the PRI and its principal opponent. We furthermore hypothesize that clientelistic effects are only present, or at least much more pronounced, in municipalities that have been under continuous PRI rule. We estimate a linear probability model on the binary outcome of a PRI win, and also apply linear specifications to the fractional outcomes. In a cross-sectional specification our general empirical model is:

$$y_{it} = \beta_0 + \beta_1 Procede_{it} + \beta_2 PRIonly_{it} + \beta_3 Procede_{it} * PRIonly_{it} + X'_{it}\alpha + u_{it} \quad (3)$$

Where y_{it} is any of our outcomes of interest and X_{it} represents the whole set of control variables including dummies for year and electoral cycle. We also include a dummy variable for whether or not the incumbent government is PRI, except for the binary dependent variable case, in which this would be the lagged dependent variable.

It is obvious that one is concerned about municipality level fixed effects. Given the panel structure of our data we can define $u_{it} = e_i + \epsilon_{it}$. The first differenced (FD) version of our model is then:

$$\Delta y_{it} = \alpha_0 + \beta_1 \Delta Procede_{it} + \beta_2 \Delta PRIonly_{it} + \beta_3 \Delta(Procede_{it} * PRIonly_{it}) + \Delta X'_{it}\alpha + \Delta\epsilon_{it} \tag{4}$$

The FD specification comes naturally at this point, as it seems reasonable to assume that the idiosyncratic error terms ϵ_{it} are highly serially correlated. Results for model (4) will be presented with standard errors computed to allow for autocorrelation in the differenced idiosyncratic error term. Given that we observe all outcomes prior to 1990, we do not lose any time period by first differencing.

As municipal authorities did not take part in Procede, we do not believe that there are any concerns regarding reverse causation in the sense that a change in the municipal government had any effect on ejidos becoming certified. But in order to allow for this possibility, we estimate an additional specification of (4) that includes the lagged dependent variable. This specification will, by construction, induce an element of non-contemporaneous endogeneity, and the parameter estimate on the lagged dependent variable will, therefore, need to be taken with a grain of salt. The importance of this exercise resides in that in the absence of any effect of the outcome variable on certification (and no lagged effect of the independent variables), the inclusion of the lagged dependent variable will not affect the parameter estimates of interest.

As it cannot be ruled out that the $\Delta\epsilon_{it}$ in (4) are correlated with the first-differenced independent variables, we present results for a number of additional specifications. The first makes the additional assumption that $\Delta\epsilon_{it} = \mu_i + \varepsilon_{it}$. This as-

sumption means that we allow the error term to include a fixed, municipality specific time trend, plus an idiosyncratic error term. If μ_i is correlated with the municipality specific time trend in any of the included independent variables, the specification in (4) would still suffer from omitted variables bias. We therefore estimate (4) using municipality level fixed effects. If the first-differenced model in (4) does not suffer from omitted variables bias, we would expect that allowing for fixed effects does not substantially alter our results. As before, we correct standard errors for potential serial correlation in ε_{it}.

Lastly, we estimate the all three specifications (simple first differences, with lagged dependent variable, and with fixed effects) instrumenting for the treatment variable *Procede* and its interaction with *PRIonly*. As before, if the specification in (4) correctly identifies the parameters of interest, we would not expect results to differ substantially.

7 Empirical Results

Tables (7)-(10) present the principal estimation results. The first one shows results for the linear binary dependent variable model using PRI victory as the dependent variable. The other three use continuous proportions as the dependent variables: Table (8) shows results on total participation, table (9) on turnout for the PRI's strongest opponent , and lastly, (10) on turnout for the PRI. Some marginal effects appear to be fairly large, but one has to keep in mind that they represent the estimated effect of a change from no certification to complete certification.

Before moving to the main results, table (5) shows results for the first stage regressions, excluding the lagged dependent variable specifications. The two pairs of columns show regression results on the certification variable *Procede* and its interaction term with the binary variable indicating a continuously PRI ruled municipality. The first two columns corresponds to the model in first differences, and the second pair to first differences with fixed effects. As can be seen, the instrument and its interaction term are highly significant and enter with the expected sign. It is striking how little the results changes once fixed effects are controlled for, which further alleviates concerns about instrument validity. The F-Statistic is always very large. The value of the Cragg-Donald statistic to test for instrument weakness can be found in the corresponding output tables, but it can already be inferred that weak instruments are not a concern.

We start by showing results for our model in levels, corresponding to expression (3) above, in table (6). Here the data's panel structure is taken into account using random effects. The benefit from this exercise is twofold: Firstly, it allows us to reconcile potentially counterintuitive point estimates in first differences. In addition, we would expect to get similar results in the IV specification as in first differences, assuming that the instrument is exogenous in levels. Table (6) shows results for our four outcomes of interest without the lagged dependent variable. As will be the case in all the following tables, the variables of interest are always the first two. That is, the effect of *Procede* in municipalities that already had a non-PRI government, and the difference of that effect in municipalities that have been constantly PRI governed.For the specifications without instruments, it can be seen that results differ

quite substantially in significance and magnitude (but not in sign) from the first differenced results in tables (7)-(10), implying that invariant municipal characteristics do act as omitted variables. For the IV versions, however, the results are more aligned in the case of the three fractional outcomes, strengthening confidence in our identification strategy. Perhaps more importantly, the point estimate on the binary variable indicating a continuously PRI ruled municipality enters with the expected sign in a statistically significant manner and large magnitude.

Moving to our principal results in tables (7)-(10). For each outcome six specifications are presented: The first three columns correspond to the model in first differences, first differences with a lagged dependent variable, and with fixed effects. Each of these three specifications is then estimated using instrumental variables, results for which are presented in columns (4)-(6). For the IV specifications we report the Cragg-Donald statistic to test for weak instruments (see Stock and Yogo (2002) for a detailed discussion of this test). Given the consistently high values of this statistic, it can be safely concluded that instrument weakness is not of concern.

Table (7) shows results for the binary dependent variable of a PRI victory. In all specifications, *Procede* increases the odds of a PRI victory significantly in municipalities that already have been governed by a non-PRI party. Full certification is estimated to increase the probability of a PRI victory by 10%-20% without instruments, and almost twice that amount once instruments are used. In the continuously PRI governed places, however, *Procede* lowers the probability of such an event by around 15% (the sum of the first two parameter estimates) for the specifications without instrument, and by a much smaller amount (1%-5%) when the treatment is

instrumented for. Note, however, that the point estimates on the interaction term, which is our variable of primary interest, vary only marginally between specifications. This pattern will hold for all our results. Including the lagged dependent variable (columns (2) and (5)) changes our estimates in no significant manner, implying that non-contemporaneous reverse causation is not a big concern.

The only control variable that enters significantly is the proportion of new voters, indicating that municipalities with a younger population (which implies that they are lagging in their demographic transition) tend to favor the PRI. At first sight, it may appear striking that the dummy variable denoting a continuously PRI ruled municipality enters significantly with a negative point estimate (as does the lagged dependent variable). One has to keep in mind, however, that the model is estimated in first differences, eliminating all the time invariant factors that possibly determine the entrenchment of the PRI. As seen before, we find the expected sign if the model is estimated in levels. The proper interpretation of this estimate is that once voters have experienced a non-PRI government for the first time, they are more likely to vote the PRI back into office than voters that have been continuously ruled by the PRI, keeping all other factor constant.

Table (8) shows that full certification increases participation by an additional 3-4% in municipalities that have been consistently PRI ruled. The effect in the baseline group is statistically insignificant if treatment is assumed to be exogenous, but increases significantly under IV estimation to an estimated effect of 5%-8%. Again, controlling for the lagged dependent variable does not change these results.

Tables (9) and 10) shed more light on the nature of these increases. In the

specifications without instruments, in accordance with the results in table (8), there is no statistically significant effect on the turnout for either party in municipalities that have not been constantly PRI ruled. In the ones that have never seen any other party in government, on the other hand, turnout for the PRI's principal opponent increases significantly by roughly 4-6%. No such statement can be made for turnout for the PRI, as Procede is still found to be mostly statistically insignificant. The point estimate of the interaction term is consistently negative, but of fairly small magnitude.

For the IV estimations, this picture remains the same for continuously PRI governed municipalities, where changes are marginal at best. However, it changes quite drastically for municipalities that already had some other party in power. Here the estimates now suggest a movement of voters from the opposition to the PRI, or, alternatively, PRI voters coming out of abstention, of a magnitude of 3%-5% of the total electorate. It is this movement that drives the corresponding results on total participation and the likeliehood of a PRI victory.

To summarize, it can be safely concluded that the results on the interaction term consistently support our principal hypothesis. Improved tenure security has the effect of significantly increasing the turnout for the PRI's locally strongest opponent in municipalities where the PRI continues to be dominant (in the sense of never having lost an election). Once the PRI's dominance is broken, this effect disappears. In addition, the IV results support the idea that the PRI benefitted electorally from the policy. This suggests that voters did reward the PRI to a certain extent. The overall effect is a stronger turnout for the PRI in all municipalities, but in continuously PRI

governed places this was offset by the effect on turnout for the opposition. It can therefore be said that our results strongly support the notion that land titles help to alleviate vote suppression.

7.1 Robustness

Our identification strategy depends in part on the assumption that clientelistic practices are primarily carried out by the PRI, and in places where it continues to be the dominant political force. One may object that over time in many places former opposition parties were able to replace the PRI as the locally dominant political force. If so, we would expect to find that certification also weakens other parties once they have become entrenched. We address this concern by adding an additional control variable for the number of opposition victories prior to the election, *Num Opposition*, and its interaction term this with *Procede*. If our hypothesis is correct, we would expect to find results of opposite sign in the two interaction terms.

Table (11) presents results for this exercise. As in table (6), we only present results for the first difference model without a lagged dependent variable. The results on the first interaction term become stronger: a strong negative effect on the binary outcome of a PRI win, a big positive effect on turnout for the major opposition party, and a small negative one for PRI turnout. The parameter on *Procede* has now to be more carefully interpreted, as it captures the effect of already having had a non-PRI government independent of the number of non-PRI administrations. The second interaction term shows that the effect of the number of opposition victories always has the opposite sign than the first interaction term. Furthermore, the two almost always

have the same level of significance. That is, the marginal effect of land certification on the probability of a PRI victory and vote losses for the opposition is larger the more dominant the opposition had been in a municipality. Using instruments only changes one result: the positive effect on PRI turnout does not depend on the number of non-PRI victories any longer.

8 Conclusion

We have shown that land is a simple yet powerful political tool that can be used to suppress votes for the opposition. This theory is strongly supported by the empirical analysis of Mexico's major land titling program, PROCEDE, carried out during the 1990s and 2000s. We find that, while the program, overall, electorally benefitted the country's long time ruling party PRI in the form of a sizable shift of votes from other parties in its favor, it also increased turnout for the locally strongest opposition party in places that had been continuously ruled by the PRI. Voters therefore appear to have rewarded the party for a popular policy, even though this policy accelerated the party's decline in clientelistic control. We believe our results contribute to understanding why the downfall of PRI occurred and serve to complement the existing explanations.

The model and empirical results also speak more broadly on the relationship between political power, property rights and resource allocation. According to the general consensus, governments should have an intrinsic interest in land certification programs. Land certification improves the government's capacity to tax, provides

tenure security and improves land markets and access to credit. However, this line of reasoning largely ignores the incentives to maintain insecure property rights if land is used as a clientelistic tool. These results are important to better understand governments' incentives in implementing land titling programs often advocated by developed country donors. Even though they may be very popular with the citizenry, rulers will not be interested in their success as long as they perceive that the loss in political control outweighs the electoral and economic benefits. In addition, our findings broaden the focus of the existing literature on the political economy of property rights which mostly discusses the role of land redistribution in rewarding political loyalties and creating coalitions of interest groups. But, as we argued in this paper, its potential use for clientelistic ends goes far beyond these group-centered strategies. If the government has discretionary powers over the reallocation of property rights, it can reward and punish individual voters in quite the same manner as with traditional clientelistic transfers but without necessarily incurring the opportunity costs of public funds.

Our results also shed further light on the differing nature of clientelistic arrangements in different institutional contexts. We have shown that our proposed mechanism works in the context of formally democratic elections with a secret ballot. Future research should investigate how tenure insecurity affects political arrangements in different, probably less democratic, contexts.

References

Albertus, M. (forthcoming): "Vote Buying with Multiple Distributive Goods," *Comparative Political Studies*.

Alesina, A., R. Baqir, and W. Easterly (2000): "Redistributive public employment," *Journal of Urban Economics*, 48(2), 219–241.

Appendini, K. (2010): "La regularización de la tierra después de 1992: la "apropiación" campesina de Procede," in *Los Grandes Problemas de México: Economía Rural*, ed. by A. Yúnez. El Colegio de México.

Baland, J.-M., and J. A. Robinson (2008): "Land and Power: Theory and Evidence from Chile," *American Economic Review*, 98(5), 1737–1765.

Bardhan, P., and D. Mookherjee (2010): "Determinants of Redistributive Politics: An Empirical Analysis of Land Reforms in West Bengal, India," *American Economic Review*, 100(4), 1572–1600.

Bizberg, I. (2003): "Transition or Restructuring of Society," *in: Tulchin, J.S. and Selee, A.D. (ed.); "Mexico's Politics and Society in Transition*, pp. 145–75.

Cornelius, W. A., and D. Myhre (eds.) (1998): *The Transformation of Rural Mexico. Reforming the Ejido Sector*chap. 1. Center for U.S.-Mexican Studies at the University of California, San Diego.

deJanvry, A., M. Gonzalez-Navarro, and E. Sadoulet (2011): "Can a populist political party bear the risk of granting complete property rights? Electoral outcomes of Mexico's second land reform," Unpublished Working Paper.

Diaz-Cayeros, A., and B. Magaloni (2003): "The politics of public spending Part II. The Programa Nacional de Solidaridad (PRONASOL) in Mexico," Background Paper for the World Bank World Development Report 2004.

Diaz-Cayeros, A., B. Magaloni, and B. R. Weingast (2006): "Tragic Brilliance: Equilibrium Party Hegemony in Mexico," Working Paper, Hoover Institution, Stanford University.

DiTella, R., S. Galiani, and E. Schargrodsky (2007): "The Formation of Beliefs: Evidence from the Allocation of Land Titles to Squatters," *Quarterly Journal of Economics*, 122(1), 209–241.

Dixit, A., and J. Londregan (1996): "The Determinants of Success of Special Interests in Redistributive Politics," *Journal of Comparative Economics*, 58, 1132–1155.

Engerman, S. L., and K. L. Sokoloff (1997): "Factor Endowments, Institutions, and Differential Paths of Growth among New World Economies," in *How Latin America Fell Behind*, pp. 260–304. Stanford University Press.

Greene, K. F. (2007): *Why Dominant Parties Lose*. Cambridge University Press.

Holzner, C. A. (2003): "End of Clientelism: Changing Political Practices Among the Poor in Mexico," Paper prepared for delivery at the 2003 meeting of the Latin American Studies Association, Dallas, Texas, March 27-29, 2003.

Keefer, P., and S. Knack (2002): "Boondoggles and expropriation : rent-seeking and policy distortion when property rights are insecure," Policy Research Working Paper Series 2910, The World Bank.

Keefer, P., and R. Vlaicu (2005): "Democracy, credibility and clientelism," Policy Research Working Paper Series 3472, The World Bank.

Klesner, J. L., and C. Lawson (2001): "Adios to the PRI? Changing Voter Turnout in Mexico's Political Transition," *Mexican Studies/Estudios Mexicanos*, 17(1), 17–39.

Krauze, E. (1997): *La Presidencia Imperial*. Tusquets Editores.

Larreguy, H. (2012): "Monitoring Political Brokers: Evidence from Clientelistic Networks in Mexico," Working Paper.

Lawson, C. (2000): "Mexico's Unfinished Transition: Democratization and Authoritarian Enclaves in Mexico," *Mexican Studies / Estudios Mexicanos*, 16, 267–287.

Lindbeck, A., and J. Weibull (2003): "Balanced Budget Redistribution as the Outcome of Political Competition," *Public Choice*, 52(3), 273–297.

Mackinlay, H., and G. Otero (2004): "State Corporatism ans Peasant Organization: Towards New Institutional Arrangements," in *Mexico in Transition:*

Neoliberal Globalism, the State and Civil Society, ed. by G. Otero, chap. 5, pp. 72–88. Zed Books.

Magaloni, B. (2006): *Voting for Autocracy: Hegemonic Party Survival and its Demise in Mexico*. Cambridge University Press.

Martínez-Vázquez, V. R. (1975): "Despojo y Manipulacíon Campesina: Historia y Estructura de Dos Cacicazgos del Valle del Mezquital," in *Caciquismo y Poder Político en el México Rural*, chap. 6, pp. 148–194. Siglo Veintiuno.

McKinley-Grohmann, H. (2011): "Las Relaciones Sociales Corporativas en el Sector Rural: 1940-2000," *Artículos y Ensayos de Sociología Rural*, 12, 13–51.

Nadler, R. (2000): "Portfolio politics: Nudging the investor class forward," *National Review*, 52(23), 38–40.

Nichter, S. (2008): "Vote Buying of Turnout Buying? Machine Politics and the Secret Ballot," *American Political Science Review*, 102(1), 19–31.

Paré, L. (1975): "Caciquismo y Estructura de Poder en la Sierra Norte de Puebla," in *Caciquismo y Poder Político en el México Rural*, chap. 2, pp. 31–61. Siglo Veintiuno.

Pfutze, T. (2012): "Clientelism vs. Social Learning: The Electoral Effects of International Migration," *Journal of Comparative Economics*, Forthcoming.

Roniger, L. (1987): "Caciquismo and Coronelismo: Contextual Dimensions of Patron Brokerage in Mexico and Brazil," *Latin American Research Review*, 22(2), 71–99.

Sanderson, S. R. W. (1984): *Land Reform in Mexico, 1910-1980*. Academic Press, Orlando.

Snyder, R. (1999): "After the State Withdraws: Neoliberalism and Subnational Authoritarian Regimes in Mexico," *in: Cornelius, A.C.; Eisenstadt, T.A. and Hindley, J. (ed.); "Subnational Politics and Democratization in Mexico*, pp. 295–341.

Sonin, K. (2003): "Why the Rich May Favor Poor Protection of Property Rights," *Journal of Comparative Economics*, 31, 715–731.

Stock, J. H., and M. Yogo (2002): "Testing for Weak Instruments in Linear IV Regression," *NBER Technical Working Paper*, 284.

Stokes, S. (2009): "Political Clientelism," in *The Oxford Handbook of Comparative Politics*. Oxford Handbooks Online.

Figure 1: The average share of votes for PRI in municipal elections from 1990 - 2007.

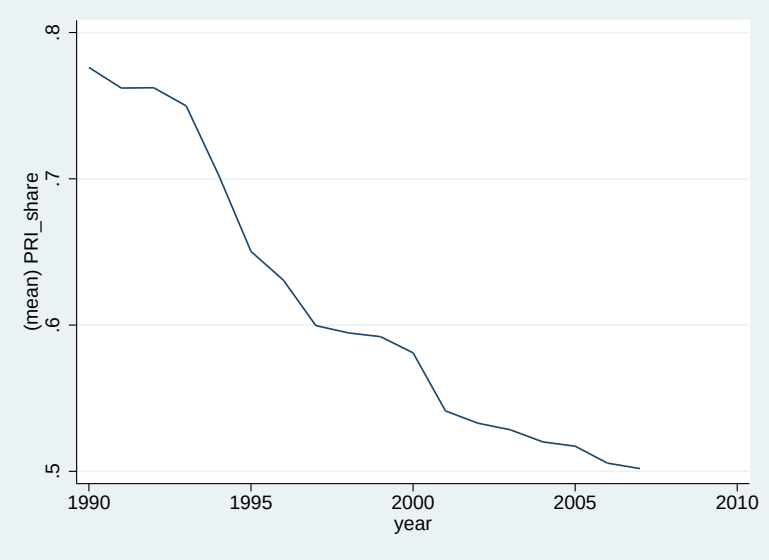


Figure 2: The average turnout in municipal elections from 1990 - 2007.

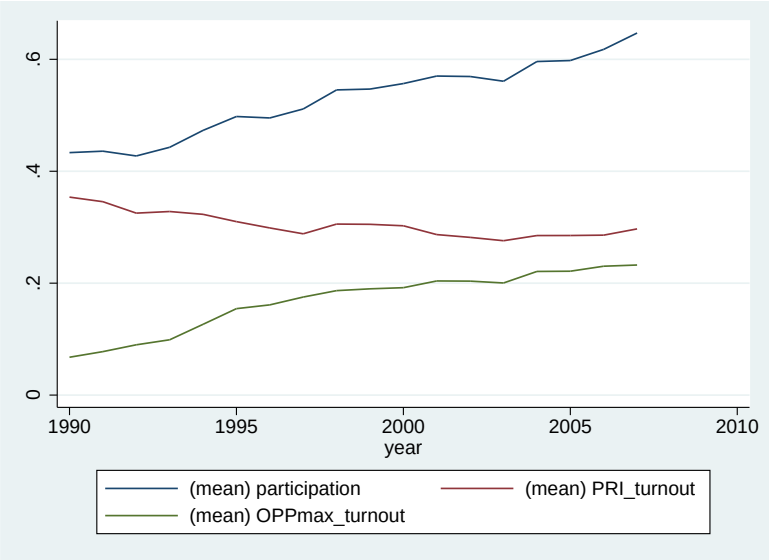


Figure 3: Voter Preferences

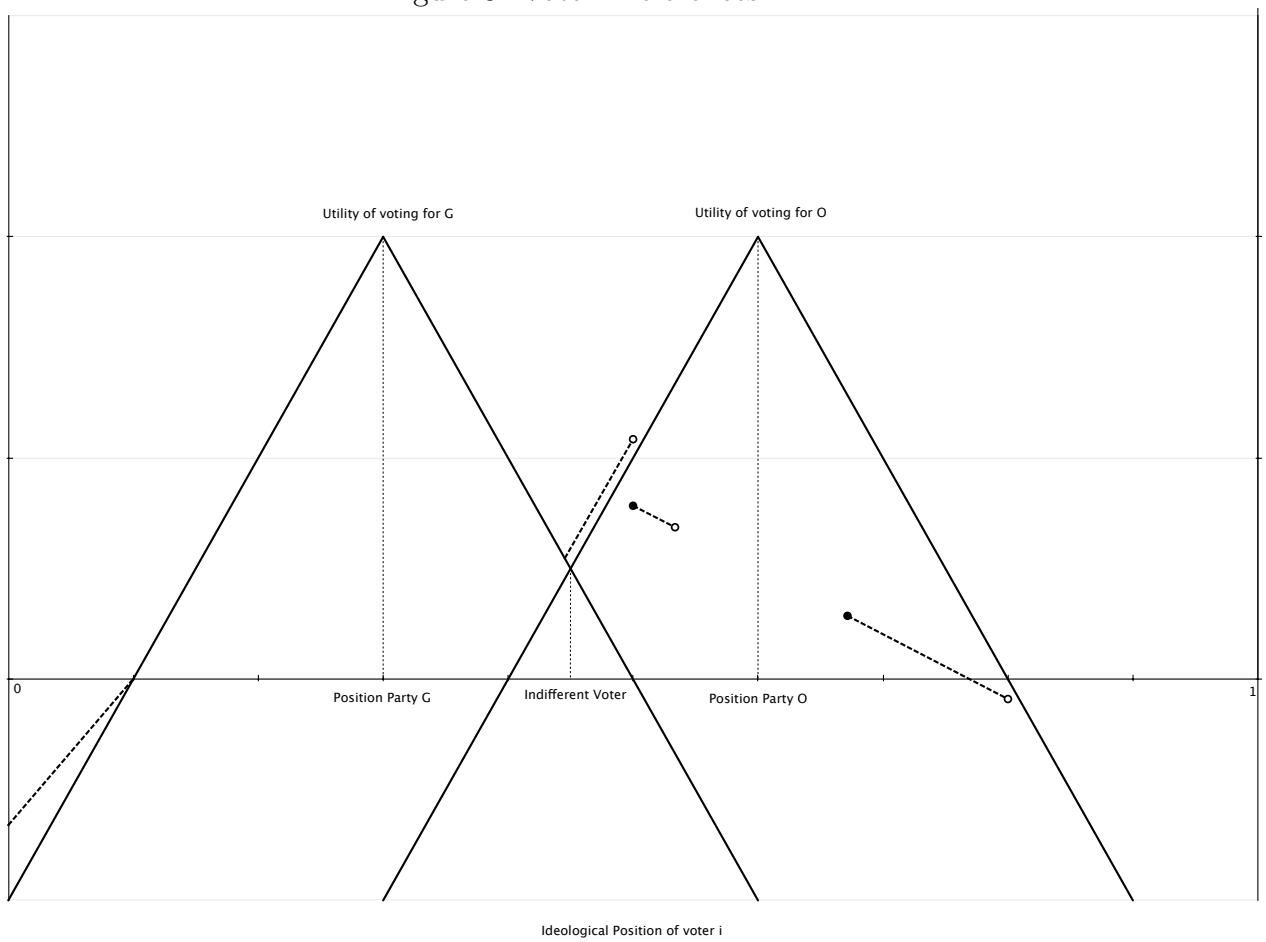


Figure 4: Transfers to be paid to increase vote margin by one.

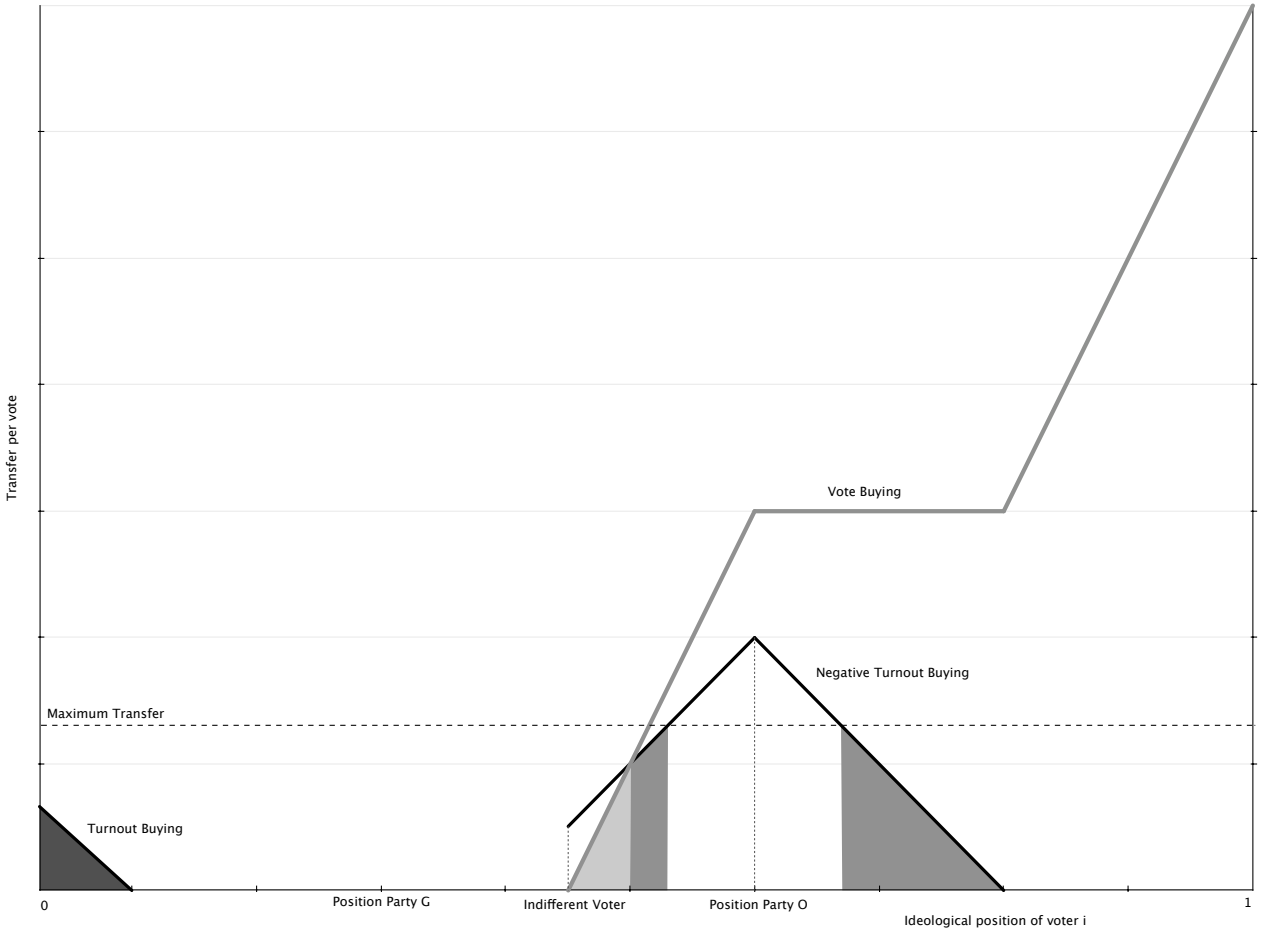


Table 1: Necessary asset transfers as a function of x_i

Voter type	**Clientelistic strategy**	**Transfer per vote**
$\mathbf{x_i \leq x^G - b}$	**Turnout buying:**	$\frac{(x^G - x_i) - b}{1+\alpha}$
$\mathbf{x^G - b < x_i \leq \frac{x^G + x^O}{2}}$	**No arrangement**	0
$\mathbf{\frac{x^G + x^O}{2} < x_i \leq x^O}$	**Negative turnout buying:** **Vote buying:**	$b - (x^O - x_i)$ $\frac{2x_i - (x^G + x^O)}{2\alpha}$
$\mathbf{x^O < x_i \leq x^O + b}$	**Negative turnout buying:** **Vote buying:**	$b - (x_i - x^O)$ $\frac{x^O - x^G}{2\alpha}$
$\mathbf{x_i > x^O + b}$	**No arrangement:** **Vote buying:**	0 $\frac{(x_i - x^G) - b}{\alpha}$

Table 2: Summary statistics for dependent variables by electoral cycle

	Obs.	**Mean**	**St. Dev.**		**Obs.**	**Mean**	**St. Dev.**
PRI Win				**Turnout**			
ALL	10624	0.68	0.47	ALL	10620	0.6	0.21
Cycle 1	1753	0.91	0.29	Cycle 1	1753	0.46	0.18
Cycle 2	1753	0.79	0.41	Cycle 2	1740	0.54	0.18
Cycle 3	1753	0.70	0.46	Cycle 3	1752	0.59	0.26
Cycle 4	1753	0.62	0.48	Cycle 4	1752	0.62	0.15
Cycle 5	1753	0.53	0.50	Cycle 5	1752	0.65	0.16
Cycle 6	1753	0.53	0.50	Cycle 6	1752	0.7	0.21
Cycle 7	106	0.57	0.50	Cycle 7	106	0.84	0.15
PRI Share				**Opp. Share**			
ALL	10617	0.30	0.14	ALL	10379	0.22	0.12
Cycle 1	1752	0.33	0.18	Cycle 1	1568	0.12	0.09
Cycle 2	1753	0.31	0.13	Cycle 2	1720	0.19	0.11
Cycle 3	1752	0.3	0.13	Cycle 3	1735	0.23	0.12
Cycle 4	1751	0.29	0.13	Cycle 4	1747	0.24	0.09
Cycle 5	1751	0.28	0.11	Cycle 5	1752	0.26	0.11
Cycle 6	1752	0.28	0.14	Cycle 6	1751	0.27	0.12
Cycle 7	106	0.39	0.12	Cycle 7	106	0.38	0.11
PRI Only				**Opp. Wins**			
ALL	10624	0.59	0.49	ALL	10624	0.49	0.94
Cycle 1	1753	0.90	0.30	Cycle 1	1753	0.04	0.23
Cycle 2	1753	0.83	0.38	Cycle 2	1753	0.12	0.41
Cycle 3	1753	0.69	0.46	Cycle 3	1753	0.25	0.61
Cycle 4	1753	0.52	0.50	Cycle 4	1753	0.49	0.86
Cycle 5	1753	0.39	0.49	Cycle 5	1753	0.83	1.1
Cycle 6	1753	0.25	0.43	Cycle 6	1753	1.2	1.32
Cycle 7	106	0.29	0.46	Cycle 7	106	0.83	1.16

Table 3: Summary statistics for independent variables by electoral cycle

	Obs.	**Mean**	**St. Dev.**		**Obs.**	**Mean**	**St. Dev.**
Procede				**New Voters**			
ALL	10624	0.49	0.41	ALL	10624	0.11	0.02
Cycle 1	1753	0.00	0.00	Cycle 1	1753	0.12	0.01
Cycle 2	1753	0.11	0.20	Cycle 2	1753	0.12	0.01
Cycle 3	1753	0.45	0.32	Cycle 3	1753	0.11	0.01
Cycle 4	1753	0.67	0.30	Cycle 4	1753	0.1	0.01
Cycle 5	1753	0.79	0.26	Cycle 5	1753	0.1	0.01
Cycle 6	1753	0.91	0.18	Cycle 6	1753	0.1	0.01
Cycle 7	106	0.94	0.16	Cycle 7	106	0.1	0.01
Total Voters				**Prop. Female**			
ALL	10624	26764	73966	ALL	10624	0.5	0.03
Cycle 1	1753	21436	57600	Cycle 1	1753	0.5	0.05
Cycle 2	1753	24041	64814	Cycle 2	1753	0.5	0.05
Cycle 3	1753	26048	70676	Cycle 3	1753	0.5	0.05
Cycle 4	1753	28039	76874	Cycle 4	1753	0.51	0.02
Cycle 5	1753	30011	82782	Cycle 5	1753	0.51	0.02
Cycle 6	1753	31937	87375	Cycle 6	1753	0.5	0.02
Cycle 7	106	11414	53644	Cycle 7	106	0.5	0.01
Revenue				**Instrument**			
ALL	10624	17.7	16.17	ALL	10624	0.63	0.42
Cycle 1	1753	9.2	11.62	Cycle 1	1753	0	0
Cycle 2	1753	10.46	10.47	Cycle 2	1753	0.35	0.34
Cycle 3	1753	11.66	9.65	Cycle 3	1753	0.67	0.3
Cycle 4	1753	18.87	13.16	Cycle 4	1753	0.84	0.24
Cycle 5	1753	24.62	16.97	Cycle 5	1753	0.91	0.2
Cycle 6	1753	30.66	19.85	Cycle 6	1753	0.98	0.14
Cycle 7	106	30.06	9.23	Cycle 7	106	0.98	0.13

Table 4: Regressions of instrument on baseline variables

	level	cycle2	cycle3	cycle4	cycle5	cycle6
	(1)	(2)	(3)	(4)	(5)	(6)
PRI Win 90-92	.019*	.017	.035**	-.013	-.021	-.021
	(.012)	(.030)	(.015)	(.021)	(.013)	(.021)
PRI Only 90-92	.003	.003	-.012	.016	.006	-.017
	(.010)	(.040)	(.035)	(.024)	(.008)	(.021)
Turnout 90-92	.119	.095	.114	.110	-.099	-.200
	(.108)	(.362)	(.264)	(.271)	(.097)	(.126)
PRI 90-92	-.147	-.306	.044	-.019	.059	.204
	(.108)	(.353)	(.251)	(.253)	(.098)	(.132)
OPP 90-92	-.240**	-.419	-.016	-.003	.146	.252*
	(.114)	(.401)	(.274)	(.298)	(.137)	(.152)
Elections in 90	-.129***	-.543***	.443***	.032	.053**	-.005
	(.009)	(.072)	(.029)	(.035)	(.021)	(.028)
Elections in 91	-.027***	-.140*	.125***	.032	-.006	-.017
	(.007)	(.079)	(.032)	(.043)	(.018)	(.027)
Population 90	-5.78e-08*	-2.14e-08	-1.56e-07	7.68e-08	3.69e-08	6.95e-08*
	(3.49e-08)	(9.53e-08)	(1.26e-07)	(1.03e-07)	(4.18e-08)	(4.11e-08)
Ruggedness	-.0004***	-.0001	-.0007*	.0004	-.0000547	.0004***
	(.0000789)	(.0005)	(.0004)	(.0004)	(.0002)	(.0001)
Distance City	-.0002**	-.0007**	.0005*	.0002	-.0001	.0001
	(.0000821)	(.0003)	(.0003)	(.0002)	(.0001)	(.0002)
Indigenous 90	-.061***	-.264*	.019	.181**	.114***	-.060
	(.017)	(.146)	(.091)	(.083)	(.042)	(.038)
Illiterate 90	-.171***	-.252	.024	.076	-.099	.206
	(.051)	(.255)	(.165)	(.121)	(.070)	(.130)
Return 90	-.255	.594	.052	-1.197	-.100	.004
	(.879)	(5.181)	(2.682)	(2.924)	(1.162)	(1.493)
Econ Active 90	-.008	-.152	.012	.306*	-.157	.061
	(.083)	(.316)	(.204)	(.176)	(.131)	(.293)
Unemployed 90	.398**	1.209***	-.728**	-.008	-.095	-.331***
	(.160)	(.462)	(.314)	(.368)	(.125)	(.127)
Mean Wage 90	.013	.041	-.006	-.037	.021	-.030
	(.014)	(.071)	(.046)	(.031)	(.017)	(.034)
Wage StD 90	-.011	-.046	.044	.017	-.022	.016
	(.018)	(.088)	(.044)	(.040)	(.034)	(.044)
Agriculture 90	.013	.094	-.056	-.070*	.041	.002
	(.023)	(.100)	(.075)	(.039)	(.027)	(.027)
Area Ejidos 91	-1.75e-07	9.16e-07	-1.61e-06**	3.81e-07	-4.39e-09	6.30e-08
	(3.70e-07)	(1.05e-06)	(6.70e-07)	(5.66e-07)	(2.91e-07)	(5.03e-07)
Ejidatarios 91	4.28e-06	7.86e-06	3.95e-06	-5.22e-06	-7.93e-06***	2.07e-06
	(3.77e-06)	(9.98e-06)	(7.72e-06)	(5.83e-06)	(3.04e-06)	(4.53e-06)
Ejidos 91	-.0003	-.002***	.002***	.0002	.0002	-.0001
	(.0003)	(.0008)	(.0006)	(.0004)	(.0002)	(.0005)
Obs.	9274	1533	1533	1533	1533	1533
F statistic	21.317	185.131	87.713	14.427	15.611	49

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Standard errors are robust to heteroskedasticity. The dependent variable in the first column is the average time since the first informational meeting during 1992-2007. The dependent variable in columns (2)-(6) is the change in the proportion of ejidos that had their first meeting during each electoral cycle.

Table 5: First stage results without additional lagged dependent variables

	FD Procede	FD Procede*PRI Only	FDFE Procede	FDFE Procede*PRI Only
	(1)	(2)	(3)	(4)
Instrument	.395***	-.243***	.391***	-.235***
	(.018)	(.013)	(.020)	(.015)
Instr*PRI Only	-.056***	.686***	-.058***	.670***
	(.014)	(.012)	(.015)	(.013)
PRI Only	.051***	.077***	.052***	.081***
	(.011)	(.008)	(.012)	(.009)
New Voters	-1.764***	-1.254***	-2.131***	-1.995***
	(.346)	(.340)	(.466)	(.474)
Prop. Female	-.117***	-.064*	-.012	-.045
	(.045)	(.036)	(.060)	(.051)
Total Voters	-3.31e-07	-1.59e-07	-2.14e-08	3.03e-07
	(2.02e-07)	(1.99e-07)	(5.81e-07)	(5.35e-07)
Revenue	-.0004*	-.0003*	-.0005*	-.0004*
	(.0002)	(.0002)	(.0003)	(.0002)
Obs.	10611	10611	10611	10611
F statistic	298.498	384.633	1569.976	405.879

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The first two columns show first stage results for the model in first differences, columns (3) and (4) for the model with first differences and fixed effects. The lagged dependent variable is omitted.

Table 6: Results for estimation in levels

	PRIwin	PRIwinIV	Turnout	TurnoutIV	OPPmax	OPPmaxIV	PRI	PRIIV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Procede	.034	.092***	-.022**	-.001	-.027***	-.043***	.004	.033***
	(.023)	(.033)	(.010)	(.016)	(.006)	(.009)	(.007)	(.011)
Procede*PRI Only	-.072***	-.067**	.040***	.046***	.069***	.079***	-.012*	-.013
	(.024)	(.030)	(.010)	(.012)	(.006)	(.007)	(.007)	(.008)
PRI Only	.206***	.202***	-.029***	-.033***	-.045***	-.052***	.034***	.033***
	(.017)	(.020)	(.008)	(.009)	(.005)	(.005)	(.005)	(.006)
Revenue	.0008**	.0007**	.003***	.003***	.001***	.001***	.002***	.002***
	(.0003)	(.0003)	(.0001)	(.0002)	(.0000866)	(.0000857)	(.0001)	(.0001)
New Voters	-1.411***	-1.284***	-.936***	-.907***	-.053	-.128	-1.651***	-1.587***
	(.348)	(.352)	(.179)	(.183)	(.106)	(.105)	(.121)	(.123)
Prop. Female	-.659***	-.684***	.023	.017	.014	.015	-.113***	-.116***
	(.124)	(.125)	(.057)	(.057)	(.034)	(.034)	(.038)	(.038)
Total Voters	-3.84e-07***	-3.79e-07***	-4.81e-07***	-4.76e-07***	-1.24e-07***	-1.24e-07***	-3.00e-07***	-2.97e-07***
	(5.76e-08)	(5.77e-08)	(3.29e-08)	(3.29e-08)	(1.94e-08)	(1.87e-08)	(2.26e-08)	(2.26e-08)
Revenue	.0008**	.0007**	.003***	.003***	.001***	.001***	.002***	.002***
	(.0003)	(.0003)	(.0001)	(.0002)	(.0000866)	(.0000857)	(.0001)	(.0001)
PRI Win Lag			-.005	-.004	.009***	.009***	-.005	-.005
			(.005)	(.005)	(.003)	(.003)	(.004)	(.004)
Obs.	10624	10624	10612	10612	10371	10371	10609	10609

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Estimation with random effects at the municipality level. The dependent variable in columns (1) and (2) is a binary indicator for a PRI victory. In columns (3) and (4) the dependent variable is total electoral turnout. In columns (5)-(6) and (7)-(8) it is the turnout for the locally strongest opposition party and the PRI, respectively. Each pair of columns shows first OLS and the IV results.

Table 7: Results for binary dependent variable PRI win.

	FD	FD	FDFE	FDIV	FDIV	FDFEIV
	(1)	(2)	(3)	(4)	(5)	(6)
Procede	.170***	.117***	.184***	.357***	.260***	.360***
	(.042)	(.038)	(.047)	(.083)	(.077)	(.095)
Procede*PRI Only	-.318***	-.260***	-.327***	-.399***	-.317***	-.378***
	(.037)	(.034)	(.043)	(.054)	(.049)	(.064)
PRI Only	-.511***	-.098***	-.564***	-.468***	-.065*	-.539***
	(.030)	(.032)	(.034)	(.037)	(.039)	(.043)
New Voters	2.232***	2.096*	1.981*	2.433***	2.325**	2.196*
	(.856)	(1.110)	(1.172)	(.870)	(1.132)	(1.183)
Prop. Female	-.270	-.175	-.387	-.270	-.178	-.409
	(.256)	(.233)	(.329)	(.257)	(.233)	(.330)
Total Voters	-5.67e-07	-3.32e-07	-3.52e-06	-5.53e-07	-3.27e-07	-3.47e-06
	(6.67e-07)	(7.65e-07)	(2.20e-06)	(6.63e-07)	(7.63e-07)	(2.20e-06)
Revenue	.0000126	.0002	-.0003	.000074	.0003	-.0002
	(.0005)	(.0005)	(.0006)	(.0005)	(.0005)	(.0005)
PRI Win Lag		-.479***			-.479***	
		(.014)			(.014)	
Obs.	10603	8863	10603	10603	8863	10603
F statistic	89.305	175.136	89.373	87.206	170.837	86.212
Cragg-Donald				243.445	240.603	197.936

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The binary dependent variable denotes a PRI victory. Standard errors allow for AR(1) process. FD stands for first differences, FDFE for first differences with municipality level fixed effects; FDIV and FDFEIV denote the models' instrumental variable versions.

Table 8: Results for dependent variable Turnout

	FD	FD	FDFE	FDIV	FDIV	FDFEIV
	(1)	(2)	(3)	(4)	(5)	(6)
Procede	-.011	-.002	-.009	.047*	.075***	.075***
	(.011)	(.011)	(.013)	(.029)	(.029)	(.027)
Procede*PRI Only	.024**	.036***	.024*	.032**	.027*	.032*
	(.010)	(.009)	(.013)	(.016)	(.016)	(.019)
PRI Only	-.012	-.029***	-.012	-.018	-.026**	-.018
	(.008)	(.008)	(.010)	(.012)	(.011)	(.014)
New Voters	.293	-.361	.662	.448	-.201	.909*
	(.442)	(.527)	(.522)	(.462)	(.549)	(.544)
Prop. Female	.420***	.389***	.541***	.417***	.386***	.527***
	(.032)	(.039)	(.057)	(.033)	(.040)	(.054)
Total Voters	-5.93e-07***	-6.99e-07***	5.00e-07	-5.68e-07***	-6.81e-07***	5.10e-07
	(1.89e-07)	(2.10e-07)	(6.61e-07)	(1.91e-07)	(2.15e-07)	(6.68e-07)
Revenue	.0003	.0003	-.0000358	.0003	.0003	.0000221
	(.0002)	(.0003)	(.0003)	(.0003)	(.0003)	(.0003)
PRI Win Lag	.002	-.0005	.003	.003	-.0001	.004
	(.004)	(.003)	(.004)	(.004)	(.003)	(.004)
Turnout Lag		-.389***			-.392***	
		(.100)			(.099)	
Obs.	8859	8816	8858	8859	8816	8858
F statistic	42.429	45.66	36.667	40.669	41.842	36.768
Cragg-Donald				239.238	234.037	184.891

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The dependent variable is total electoral turnout. Standard errors allow for AR(1) process. FD stands for first differences, FDFE for first differences with municipality level fixed effects; FDIV and FDFEIV denote the models' instrumental variable versions.

Table 9: Results for dependent variable vote share out of total electorate for the locally strongest opposition party

	FD	FD	FDFE	FDIV	FDIV	FDFEIV
	(1)	(2)	(3)	(4)	(5)	(6)
Procede	-.007	-.012*	-.004	-.027*	-.027*	-.019
	(.007)	(.007)	(.008)	(.015)	(.015)	(.017)
Procede*PRI Only	.047***	.062***	.039***	.068***	.085***	.053***
	(.007)	(.007)	(.008)	(.010)	(.009)	(.012)
PRI Only	.010	-.010	.017**	-.002	-.024***	.009
	(.007)	(.007)	(.008)	(.008)	(.008)	(.010)
New Voters	.207	.015	-.021	.196	.013	-.014
	(.253)	(.267)	(.337)	(.263)	(.277)	(.350)
Prop. Female	.088**	.108***	.199***	.088**	.108***	.201***
	(.037)	(.041)	(.056)	(.037)	(.041)	(.057)
Total Voters	-2.78e-07**	-4.90e-07***	5.98e-07	-2.70e-07**	-4.80e-07***	5.87e-07
	(1.11e-07)	(1.22e-07)	(4.21e-07)	(1.10e-07)	(1.22e-07)	(4.20e-07)
Revenue	.0001	.0003**	-.0002	.0001	.0003**	-.0002
	(.0001)	(.0001)	(.0001)	(.0001)	(.0001)	(.0002)
PRI Win Lag	.037***	.006	.039***	.037***	.006	.039***
	(.003)	(.004)	(.004)	(.003)	(.004)	(.004)
Opp. Share Lag		-.416***			-.418***	
		(.056)			(.056)	
Obs.	8630	8198	8628	8630	8198	8628
F statistic	55.82	61.284	56.021	56.394	61.912	56.513
Cragg-Donald				241.371	223.611	187.307

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The dependent variable is turnout for the locally strongest party other than the PRI. Standard errors allow for AR(1) process. FD stands for first differences, FDFE for first differences with municipality level fixed effects; FDIV and FDFEIV denote the models' instrumental variable versions.

Table 10: Results for dependent variable vote share out of total electorate for PRI

	FD	FD	FDFE	FDIV	FDIV	FDFEIV
	(1)	(2)	(3)	(4)	(5)	(6)
Procede	-.005	.001	-.005	.039**	.053***	.051***
	(.006)	(.007)	(.008)	(.018)	(.018)	(.018)
Procede*PRI Only	-.011*	-.011*	-.008	-.007	-.017*	.0005
	(.006)	(.006)	(.007)	(.010)	(.010)	(.012)
PRI Only	-.009*	-.011**	-.013**	-.012*	-.009	-.019**
	(.005)	(.005)	(.006)	(.007)	(.007)	(.008)
New Voters	-.159	-.539*	.444	-.045	-.429	.619*
	(.292)	(.317)	(.335)	(.303)	(.326)	(.354)
Prop. Female	.249***	.237***	.283***	.247***	.235***	.273***
	(.032)	(.034)	(.045)	(.033)	(.035)	(.046)
Total Voters	1.79e-07*	3.47e-07***	-1.59e-08	1.97e-07**	3.61e-07***	-1.14e-08
	(9.53e-08)	(1.11e-07)	(3.04e-07)	(9.73e-08)	(1.14e-07)	(3.09e-07)
Revenue	.0002	.0002	.0002	.0002	.0002	.0002
	(.0001)	(.0001)	(.0002)	(.0001)	(.0001)	(.0002)
PRI Win Lag	-.027***	-.011***	-.028***	-.027***	-.010***	-.028***
	(.002)	(.003)	(.003)	(.002)	(.003)	(.003)
PRI Share Lag		-.281***			-.284***	
		(.048)			(.048)	
Obs.	8854	8807	8853	8854	8807	8853
F statistic	49.59	62.587	47.926	49.608	62.271	46.795
Cragg-Donald				238.892	233.927	184.489

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The dependent variable is turnout for the PRI. Standard errors allow for AR(1) process. FD stands for first differences, FDFE for first differences with municipality level fixed effects; FDIV and FDFEIV denote the models' instrumental variable versions.

Table 11: Results estimation in first differences including the number of opposition victories and its interaction with PROCEDE as additional variables of interest.

	PRIwin	PRIwinIV	Turnout	TurnoutIV	OPPmax	OPPmaxIV	PRI	PRIIV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Procede	.089***	.376***	-.002	.061*	.007	-.018	-.005	.051***
	(.033)	(.072)	(.014)	(.033)	(.009)	(.017)	(.008)	(.020)
Procede*PRI Only	-.365***	-.602***	.017	.024	.041***	.071***	-.017**	-.024**
	(.029)	(.043)	(.012)	(.017)	(.008)	(.010)	(.007)	(.011)
Procede*Num Opposition	.291***	.287***	-.011	-.021*	-.024***	-.028***	.009**	-.0009
	(.028)	(.043)	(.007)	(.011)	(.005)	(.007)	(.005)	(.007)
PRI Only	-.638***	-.512***	-.006	-.011	.025***	.007	-.016***	-.011
	(.024)	(.030)	(.009)	(.012)	(.007)	(.008)	(.005)	(.007)
Num Opposition	-.803***	-.816***	.007	.016	.041***	.046***	-.037***	-.030***
	(.027)	(.037)	(.007)	(.011)	(.004)	(.006)	(.005)	(.007)
New Voters	1.241	1.341	.285	.439	.251	.249	-.227	-.118
	(.861)	(.882)	(.444)	(.464)	(.253)	(.265)	(.294)	(.304)
Prop. Female	-.116	-.112	.416***	.410***	.078**	.077**	.254***	.249***
	(.162)	(.163)	(.032)	(.033)	(.039)	(.039)	(.030)	(.031)
Total Voters	1.58e-06**	1.62e-06**	-5.78e-07***	-5.46e-07***	-3.48e-07***	-3.40e-07***	2.97e-07***	3.22e-07***
	(7.77e-07)	(7.65e-07)	(1.86e-07)	(1.88e-07)	(1.18e-07)	(1.17e-07)	(9.43e-08)	(9.71e-08)
Revenue	-.0007	-.0007	.0002	.0003	.0002	.0002	.0002	.0002
	(.0004)	(.0004)	(.0002)	(.0003)	(.0001)	(.0001)	(.0001)	(.0001)
PRI Win Lag			.002	.002	.033***	.034***	-.024***	-.024***
			(.004)	(.004)	(.003)	(.003)	(.002)	(.002)
Obs.	10603	10603	8859	8859	8630	8630	8854	8854
F statistic	261.749	233.052	39.384	37.672	55.607	55.526	53.963	55.312
Cragg-Donald		157.41		153.207		155.042		152.982

Notes: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All estimations are in first differences with standard errors that allow for AR(1) process. The dependent variable in columns (1) and (2) is a binary indicator for a PRI victory. In columns (3) and (4) the dependent variable is total electoral turnout. In columns (5)-(6) and (7)-(8) it is the turnout for the locally strongest opposition party and the PRI, respectively. Each pair of columns shows first OLS and the IV results.