Democratisation under Diversity: Theory and Evidence from Indonesian Communities

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Abstract

We study the effect of two distinct types of diversity — ethnic and taste — on the incentives for fostering local democratic processes following fiscal decentralisation. The theory we develop identifies subtle differences: increased ethnic diversity may or may not impede local democratisation, depending upon the ambient level of ethnic heterogeneity. Taste diversity has a more direct relationship — if it is higher than a threshold, local democratisation is not an equilibrium. Moreover, the combined effect of these two diversities is detrimental towards local democratic practices. We test these predictions using Indonesian community-level data. Utilising the 1997 and 2007 Indonesian Family Life Survey (IFLS) rounds, we are able to construct various measures of ethnic diversity. Also, we exploit an institutional feature of Indonesia — namely, the observance of traditional "Adat" laws to proxy for taste diversity. Overall, we find that both types of diversity create barriers for local democratisation at the community level, which is consistent with our theory.

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1 Introduction

An important precondition for good governance is the degree of community homogeneity. This finds fervent mention in the writings of John Stuart Mill (1861: p.289): "among a people without fellow-feeling, the united public opinion necessary to the working of representative government cannot exist." More recently, Easterly and Levine (1997) argued that diverse societies cannot agree on needed public goods and are more likely to engage in rent-seeking activities. Collier (2008) too points out that ethno-linguistic fractionalisation reduces trust, increases transactions costs and adversely affects development in general. Some argued that decentralisation at the local level may reduce the adverse effects of diversity (e.g., Azfar et al. 2001). This is because the extent of diversity is likely to be lower at the local than at the national level. Also, decentralisation that involves a certain devolution of powers to local agents may promote democracy and increase accountability to local people. However elite capture may not be ruled out (Bardhan and Mukherjee, 2000). This is more so when the centre retains the bulk of resources, which may lead to lobbying, bargaining and the consequent uncertainty in the process of development.

While much of the work on the link between diversity and development is done at the country-level, whether and how decentralisation may affect community governance and local development in diverse communities remains rather underexplored (with an important exception of Padro-i-Miquel et al. 2014; see below). The present paper raises two questions: (i) How does ethnic diversity at the local community level affect the community members ability to reap the gains from decentralisation? (ii) To what extent does diversity in taste for public goods condition the success/failure of the community to capitalise on the policy of fiscal decentralisation?

We thus depart from much of the existing literature in that we distinguish between ethnic and taste diversity. Ethnic diversity is measured by the population sizes of the non-elite groups while taste diversity accounts for their preferences over public funds usage. Undoubtedly, ethnic diversity implies a certain difference in the preferences over public goods — this is true in our setup too. However, almost all the previous works have ignored the *extent* of the difference in preferences. This is what we call the extent of taste diversity in our model. Given that the existing literature has simply assumed a fixed but implicit level of the difference in preferences, the only relevant correlate of public spending has been ethno-linguistic fractionalisation index ELF (Taylor and Hudson, 1972) and other similar measures. We make this assumed difference in tastes *explicit* and do comparative statics on this variable. To clarify the difference further, let us take a simple example: let us consider Hindus and Muslims in a community in some district of India. Simply saying that public expenditure will be low, *ceteris paribus*, in places which have an even mix of Hindus and Muslims is imprecise. One has to account for the actual difference in the *preferences* for different types of public expenditure/goods — looking at the group sizes of Hindus and Muslims is not enough.

In reality, however, one typically does not have a clear empirical measure of differences over the preference for public goods. This is precisely why Indonesian communities provide an ideal setting for examining these nuanced differences in ethnic and taste diversity. The presence of the Adat custom will allow us to utilise adherence to Adat laws as implying high homogeneity in the preferences for public goods.[2] We are furthermore able to see these forces at play more clearly, owing to the 2001 decentralisation which allowed local communities a chance to organise themselves and lobby.

We first build a simple game-theoretic model of lobbying to lay down the framework for addressing questions (i) and (ii). Next, we take the predictions from the model to the empirical setting in Indonesia. We make a clear distinction between ethnic diversity and taste diversity in our theory which we try to maintain in the empirical context. In our framework, there is an elite group and the non-elites are divided into two ethnic groups. Thus, there is diversity in terms of social class (elite/non-elite) and in terms of ethnic preferences (within the non-elites).[3] Ethnic diversity in our model stems from the difference in *sizes* of the different ethnic groups. Diversity in taste arises since each group has its own most-preferred allocation of the (local) public funds which are all distinct across the groups. Hence, lobbying together with others necessarily involves a sacrifice in terms of the enjoyment of the public funds — the larger the diversity in tastes, the greater this sacrifice.

The main idea is the following: decentralisation increases the influence of the local politician. Therefore, it is in the interest of the community to be able to "influence" this person. To do so, each group (the elite, any of the two non-elite ethnic groups) may exert itself as a lobby.[4] If the group is successful, then they are able to implement the local public goods allocation they most desire. However, any group may choose to ally with another group (or all citizens may come together). This is, of course, typically not an unmixed blessing. While the greater numbers potentially increase the chance of success against the local politician, it comes at a cost — the lobby members have to agree on a compromise allocation of local public goods; hence, there exists a clear trade-off. We check how this trade-off is resolved at varying levels of ethnic diversity. It turns out that increasing ethnic diversity affects the equilibrium form of lobbying in different ways — the specific effect depends upon the degree of underlying ethnic heterogeneity and the extent of *taste* diversity. When it comes to increased taste diversity, the result is much more straight-forward: if taste diversity is sufficiently large, all the citizens lobbying together can never be an equilibrium. On the whole, taste diversity appears to be the bigger impediment to local democracy than ethnic diversity — a finding which seems quite relevant.

[2]Pal and Wahhaj (2017) provide new evidence that fiscal decentralisation led to a significant increase in community spending on social infrastructure (health and education) in communities which observed strict adherence to customary laws and had a tradition of local democracy.

[3]This is similar to Bandiera and Levy (2011).

[4]The lobbying is modelled as a standard contest where the efforts of each of the lobbyists determine the relative chances of success.

We investigate these predictions in the context of Indonesian communities. Fiscal decentralisation in post-Suharto Indonesia was largely an exogenous event for the communities, which has its roots in Law 22/99 and Law 25/99 enacted in January 2001. It gave local communities more autonomy in raising local revenues while enforcing strict budgetary cuts on the central leadership to supply development grants to these communities. It also granted administrative authority to local governments to hire staff and conduct local government affairs with a minimum intervention of the central government. Local community governments were made responsible to the district government who provided the bulk of their funds after FD; in other words, the centre of power moved from the central government in Jakarta to the district governments located in district head-quarters after FD. We study the local communities at 1997 and at 2007 — two years separated by the introduction of FD in 2001. Our analysis is based on the community level data obtained from 1997 and 2007 Indonesian Family Life Survey (IFLS) from 312 rural and urban communities, drawn from 13 provinces. These waves allow for a *pre* and *post* study vis-a-vis the fiscal decentralisation policy.

We observe the size of the top three population groups in the sample communities which we use to construct indices of ethnic diversity. Finally, to get at the notion of taste diversity, we utilise an institutional feature of Indonesian communities. Adat law was recognised by the colonial administration in the Dutch Indies as part of a dual legal system in which natives were subject to 'their own religious laws, institutions and customs so far as they were not in conflict with generally recognized principles of equity and justice ...' (Fasseur 2007). Based on the knowledge and information of a local expert, the Indonesian Family Life Surveys (IFLS) classified all communities in terms of their adherence to adat laws. Since adherence to adat laws in sample communities has not remained stable during 1997-2007, we classify communities as "stable adat" if and only if these communities strictly adhere to adat laws in both waves of the IFLS survey. Pal and Wahaaj (2016) have shown the close correspondence between strict adherence to adat and the ethic of mutual cooperation of communities in various activities including public infrastructure projects. Accordingly, we envisage that stable adat reflects taste homogeneity, while its complement non-adat (that accounts for by an absence of strict adherence to adat norms in both 1997 and 2007) reflects taste diversity in our context.

The 1997 and 2007 rounds of the IFLS asked community leaders about how a leader was selected. Accordingly, we are able to classify local politics as follows: "democratic" if a leader is selected by free and fair elections with voters being all community members, and "oligarchic" if a leader is selected by community elites who then remain uncontested. Our central hypotheses pertain to the possibility of joint lobbying by the community. We argue that the concept of joint lobbying is closely linked to the concept of democracy in our sample. IFLS data also provide information on the spending allocation of the local community government in both 1997 and 2007 rounds. Total spending has the following components: (i) development spending refers to spending on new social (e.g., local schools and health centres) and physical (e.g., roads and transport) infrastructure as well as maintenance of ex-

isting infrastructure; (ii) non-development spending includes spending on staff salary, office maintenance, official trips and contingencies; (iii) some under-developed communities also receive grants for various developmental programs, e.g., IDT for under-developed communities. Accordingly, we measure local development by the (natural logarithm of) total development spending. We also consider the share to development spending in total community spending as an alternative index of local development.

Using these data, we are able to test the models predictions for democratisation as well as local development, arguing that both ethnic and taste diversity measures used are exogenous to democratisation and development after decentralisation. By and large, we find that both forms of diversity — ethnic and taste — affect local democratic practices. Communities with either type of diversity appear to benefit less from decentralisation as compared to their more homogenous counterparts. Also, we find a detrimental impact of the *confluence* of these two types of diversity on the development spending allocation of the local community government.

Our contribution intertwines with various strands of the literature. The literature on ethnic diversity and development revolves around the general consensus that ethnic diversity is detrimental to development (Easterly and Levine, 1997; Alesina et al. 1999; Banerjee and Somanathan, 2007; Collier 2008). Moreover, the literature on decentralisation is sizeable and diverse. Some of this literature tends to analyse the effects of some aggregate measure of decentralisation on public policy and development in cross-country set-up. Some use cross-sectional (see for example, Davoodi and Zou (1998), De Luca et al. (2002), De Mello and Barenstein (2001) and Fishman and Gatti (2002)) while others use panel (Enikolopov and Zhuravskaya (2007)) data. In particular, Enikolopov and Zhuravskaya (2007) show that FD is more successful in those economies which are more politically decentralised. They, however, do not investigate the nature and variation of political decentralisation across the sample countries. Additionally, there is the literature — mostly in the fields of Political Science and Economics — on democratic capture by the elite or other interest groups by means of vote buying, voter co-optation, patronage networks, and the use of force or its threat (e.g., see Bardhan, 2002; Bardhan and Mookherjee, 2006) at a more local level.

Besley et al. (2005) used community level data to assess the role of individual characteristics of the local politicians on the quality of decentralised governance. They found that education increases the likelihood of selection to public office and reduces the odds that a politician uses political power opportunistically. Land ownership and political connections too boost the likelihood of selection but do not affect politician opportunism. As such, these studies do not directly focus on identifying the causal impact of FD on governance in diverse communities. Martinez-Bravo (2014) assesses the impact of the first post-Soeharto parliamentary election in Indonesia to test if new democracies experience greater electoral fraud and more clientelistic spending than established democracies. Using both village and district-level Indonesian data over 1999 – 2002, she shows that the body of appointed local

officials that a new democracy (predominantly the urban ones) inherited from the previous regime is a key determinant of the extent of these practices.

Next, we briefly dwell upon two papers which are closest to our work. Bandiera and Levy (2011) examine if political outcomes in local democracies are determined by the preferences of the median, typically poor agents, or that of the rich elite. Their empirical analysis using the 1997 Indonesian Family Life Survey data reveals that democratic policy outcomes are closer to the elite preferences in ethnically diverse decentralised communities. Padro-i-Miquel et al. (2014) validate it for the case of rural China:t hey show that one of the preconditions for exogenously introduced grassroots democracy to be effective is the degree of community homogeneity in some vertical attribute (religion in their case) that allows better provision of public goods. In particular, they find that voter heterogeneity constrains the potential benefits of elections for public goods provision. While closely related to these two papers, our work makes a marked departure in that we show how ethnically diverse communities may benefit less from decentralisation when there is taste diversity; and, in this respect, we assess the effects of FD on both democratisation and local development spending. We are thus able to disentangle the two components of diversity — ethnic group size and intensity of differences in preferences — which the previous literature has largely ignored.

The remainder of the paper is organised as follows. Section 2 presents a simple model designed to address our main questions. Section 3 describes the data, the empirical strategy and findings and Section 4 concludes. All proofs are contained in the appendix.

2 Theory

Here we set up a simple model to study the potential effects of decentralisation upon the effective organisation of local governance at the community level. Decentralisation increases the influence of the local politician. This, in turn, implies that the community as a whole recognise that controlling the local politician is valuable. This potentially spurs the constituent ethnic groups within the community to lobby together in order to influence the local politician. However, the degree of diversity inherent in society — be it in terms of taste or ethnicity — affects the coordination efforts by influencing the potential gains and the costs of cooperation.

2.1 A Model

In our model, there is a local politician (L) and two constituent social groups within the village community — call them E and C, where the former denote the (local) elite and the latter the non-elite citizens. We will assume that the mass of the elites is λ which lies between $(0, 1/2)$ and that of the non-elite citizens is $1 - \lambda$. Furthermore, the non-elites are

divided into two distinct *ethnic* groups. Suppose $\rho \in [1/2, 1)$. Let $\rho(1-\lambda)$ denote the size of the larger ethnic group while the smaller group is of mass $(1-\rho)(1-\lambda)$. We shall call them C_1 and C_2, respectively, so that $C_1 \bigcup C_2 = C$. This division of the village community along class (elite/non-elite) and ethnic lines (two groups within the non-elite) is similar to the one in Bandiera and Levy (2011).

A major distinction across the three socio-economic groups arises from their preferences over the allocation of (local) public goods — which, post-decentralisation, depends upon the extent to which either group can influence L. Let us say that post-decentralisation there is a quantity of funds (the local budget) which is in the hands of L. Call this amount R which is assumed to be strictly positive. Now depending upon the efforts of a lobby (if any arises), the distribution of the local public goods will be determined. Suppose group i — for $i \in \{E, C_1, C_2\}$ — successfully influences L and hence can unilaterally decide on the allocation of public goods. Then this provides the members of group i with a utility of R. For the *other two* groups, this bundle of public goods provides some reservation utility which we normalise to 0.

In the situation where any two (out of the three) groups are able to form a coalition to jointly rally against L in order to have their say over local public spending, each group receives a payoff of $R\beta$ in the event of a *successful* joint lobbying action, where $\beta \in (0, 1)$. Think of the resulting mix of public goods arising from this joint lobbying activity as one which is like a 'compromise' bundle — hence providing each group with a payoff no higher than what their (respective) optimal mix of public goods would bring.

In the scenario where all *three* groups collectively lobby against the local politician and are successful, each receive a payoff of $R\beta^2$. This situation is clearly the one which involves the greatest compromise as all the groups have to be accommodated. In case no group is able to successfully influence L, then they each get a baseline payoff of 0, which is simply a normalisation. In this scenario, L retains the surplus from having complete influence over local spending which provides L a payoff of $R > 0$.[5]

Another way to interpret these lobbying possibilities is to consider the scenario where the district authorities — rather than L — is in charge of allocation of funds to each of these villages/communities. In this setting, lobbying by any group would mean that they are trying to influence the *district authority* about the allocation and their efforts are being resisted by the local politician who wishes to "consume" these rents (handed down from the district level) or use them to further his private interests.

The sequence of events in this game is as follows.

(i) The elite group, E, moves first and decides amongst the following actions: lobby alone, suggest lobbying jointly to C_1 or C_2 or both, or not lobby.

[5]The use of linear utilities is solely for ease of exposition — nothing of essence is lost if we replace R throughout by $u(R)$ with $u' \geq 0$.

(ii) In case E suggests joint lobbying, the other group(s) can either accept or refuse. In the latter case, E can either lobby singly or not at all.

(iii) In case E decides not to lobby at all, then C_1 can either lobby alone or with C_2, or not lobby.

(iv) Based on C_1, C_2 and Es' lobbying decisions, L decides to resist or not.

(v) If the citizens decide not to lobby, then L gets R. Otherwise the winner(s) of the lobbying game get $R\beta$, $R\beta^2$ or R as the case may be.

The issue of coordination — within the community — across the constituent groups manifests itself in a decision of whether (or not) to jointly lobby against/coax the local politician to spend the funds in the manner the community *collectively* values. Alternatively, each group can try to coax the local politician — by lobbying individually — to provide their respective desired public goods bundle which differs from the one the community jointly values. The joint lobbying action can be viewed as opting for democratic control whereas the individual lobbying can be seen as trying to set up an oligarchy. The local politician tries to resist any such coaxing so that he can either peddle his newfound (courtesy of decentralisation) influence to further his private gains.

The outcome of the lobbying is determined by a contest success function which will be made clear shortly.

Before proceeding further, it is necessary to highlight some key features of our simple model. There is a distinction between ethnic diversity (as measured by the population sizes of the ethnic groups) and taste diversity which accounts for their preferences over public funds usage. The former is captured by the parameter ρ, which denotes the ethnic cleavage within the non-elites. The latter manifests itself in the tension between what is optimal for a specific subgroup and what is optimal for the entire community — it is enshrined in the extent of compromising that needs to be done when lobbying alongside others. In our setup, taste diversity is effectively captured by a *single* parameter, namely, β. The closer β is to unity, the smaller the differences in taste between the various groups.

Another feature which is relevant concerns the "size" of the elite — which we call λ and assume that it lies between 0 and 1/2. In a sense, λ is really the effective weight of the elite in the contest games. So while it is related to the actual population of the elites, it is essentially a measure of their influence in the political arena within the community. Furthermore, in our setup, the political arrangement for "sharing" the local budget prior to decentralisation is not pertinent for the equilibrium after decentralisation. This is because that prior arrangement is not a "default option" for any of the players — there is no possibility of any group threatening to revert to the original (i.e., pre-decentralisation) arrangements.

Next, we describe the payoffs in each of the possible subgames which follow from E's choice at the step (i). We assume that there is a group leader within each group — C_1, C_2 or E — who decides on the effort/resources for lobbying on behalf of the group; all the members of

the group then contribute according to this decision. This is essentially to rid ourselves of the standard free-rider problem.[6] The group leader chooses the effort level with the aim of maximising the expected per-capita payoff to the group just like in Esteban and Ray (2008). Another point to note is that the payoffs from cornering R is *public* — every member of the lobby who "wins" R in the contest enjoys the utility level of R net of effort costs.

We start with the case where E chooses to lobby alone.

2.2 Case (A): E lobbies alone

Here E's problem is to choose the effort level e to maximise

$$\left[\frac{\lambda e}{\lambda e + e_L}\right] R - \frac{1}{2}e^2.$$

The idea is that in case E is successful, which happens with a probability $\frac{\lambda e}{\lambda e + e_L}$, then E can get it's most preferred mix of public goods allocated in the village. Of course, such lobbying (denoted by e) is costly and hence the convex cost function $\frac{1}{2}e^2$.

The local politician resists with some effort e_L. L gets a payoff of $\left[\frac{e_L}{\lambda e + e_L}\right] R - \frac{1}{2}e_L^2$ which he can affect by his choice of e_L.[7]

2.3 Case (B): E and C_1 lobby jointly

Here the reward to each of the two groups upon victory is a mix of public goods which is a compromise; hence, a per-capita utility of $R\beta$ accrues to each lobbyist. Given that they collaborate towards this equal reward, we assume that they contract between themselves to supply the same level of effort per-capita.[8] Call this e.

So the payoff to group i — for $i \in \{E, C_1\}$ — is given by

$$\left(\frac{[\lambda + \rho(1-\lambda)]e}{[\lambda + \rho(1-\lambda)]e + e_L}\right) R\beta - \frac{1}{2}e^2.$$

Like before, L chooses e_L to maximise his payoff of

$$\left(\frac{e_L}{[\lambda + \rho(1-\lambda)]e + e_L}\right) R - \frac{1}{2}e_L^2.$$

[6] This approach is quite common in such types of games. See Esteban and Ray (1999), (2008) among others.

[7] It is not necessary that L has the same cost (function) of effort as the ethnic groups. Any standard strictly increasing and convex function will suffice. We make this assumption for the sake of simplicity.

[8] Whether the two groups write down an explicit contract or not is not important in our setting.

The case of E and C_2 lobbying jointly is analogous — accounting for the difference in the mass of C_2 (as compared to C_1) yields the corresponding expressions.[9]

2.4 Case (C): C_1 and C_2 lobby jointly

Like in case (B), the reward to each of the two groups upon victory is a compromise mix of public goods which they value equally; hence, a per-capita utility of $R\beta$. Here too, we assume that they contract between themselves to supply the same level of effort per-capita. Call this e.

So the payoff to group i — for $i \in \{C_1, C_2\}$ — is given by

$$\left(\frac{(1-\lambda)e}{(1-\lambda)e + e_L}\right) R\beta - \frac{1}{2}e^2.$$

Like before, L chooses e_L to maximise his payoff of

$$\left(\frac{e_L}{(1-\lambda)e + e_L}\right) R - \frac{1}{2}e_L^2.$$

2.5 Case (D): C_j lobbies alone for $j \in \{1, 2\}$.

This is the direct analogue of Case (A). The only changes stem from the contest success probabilities which need to be adjusted for the size of the lobbying group. Hence, λ is replaced by $(1-\lambda)\rho$ or $(1-\lambda)(1-\rho)$ as the case may be.

2.6 Case (E): All the groups lobby together

In this situation, each of the groups have to make the greatest compromise – so each gets $R\beta^2$ if they succeed. They collectively choose e to maximise the following

$$\left[\frac{e}{e + e_L}\right] R\beta^2 - \frac{1}{2}e^2.$$

L chooses e_L to maximise his payoff of

$$\left[\frac{e_L}{e + e_L}\right] R - \frac{1}{2}e_L^2.$$

[9] As we show below, a coalition of E and C_2 does not arise in equilibrium.

2.7 Case (F): Nobody lobbies

Each of the groups get the same payoff which is normalised to 0 while L gets his "rent" R.

2.8 Equilibrium

Based on E's action at the first stage, only one of the preceding cases will arise in equilibrium. Given the nature of the game, we adopt *subgame perfection* as the appropriate equilibrium concept. We begin with solving for the equilibrium payoffs to the different players in each of the subgames described in cases (A) — (E). The appendix contains the details of the derivations of these expressions.

2.9 Main Results

Suppose E chooses to lobby alone. In that situation (case (A)), the optimal choice of effort by E is given by

$$e^* = \frac{\lambda^{1/2} R^{1/2}}{1+\lambda}.$$

Based on L's best response function, his effort is given by

$$e_L^* = \frac{\lambda^{1/2} R^{1/2}}{1+\lambda}.$$

Plugging these values into the payoff functions yield the following:

$E's$ payoff from lobbying alone is given by

$$\pi_{EA} = \left(\frac{\lambda R}{1+\lambda}\right)\left[1 - \frac{1}{2(1+\lambda)}\right]. \tag{1}$$

Suppose E and C_1 decide to collectively influence the local politician, namely, case (B). Here each of the two groups provide the same per-capita effort e while the local politician resists them with his effort level of e_L. In this subgame, the optimal (common) effort level of C_1 and E is given by

$$e = \frac{[\lambda + \rho(1-\lambda)]\beta^{3/4} R^{1/2}}{1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}}$$

while that of L is given by

$$e_L = \frac{[\lambda + \rho(1-\lambda)]\beta^{1/4} R^{1/2}}{1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}}.$$

Notice how the effort level of the lobby group relative to that by L drops as the lobby group increases in size in the move from E to $E \bigcup C_1$. To be sure, the fact that the value of the

prize declines owing to $\beta < 1$ is important in this consideration too.

The above effort levels imply that the per-capita payoff that C_1 and E each receive is given by

$$\pi_{EC_1} = \left(\frac{[\lambda + \rho(1-\lambda)]\beta^{3/2}R}{1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}}\right)\left[1 - \frac{1}{2[1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}]}\right]. \tag{2}$$

Similarly, the payoff to the lobby composed of E and C_2 is given by

$$\pi_{EC_2} = \left(\frac{[\lambda + (1-\rho)(1-\lambda)]\beta^{3/2}R}{1 + [\lambda + (1-\rho)(1-\lambda)]\beta^{1/2}}\right)\left[1 - \frac{1}{2[1 + [\lambda + (1-\rho)(1-\lambda)]\beta^{1/2}]}\right]. \tag{3}$$

OBSERVATION **1.** *π_{EC_1} is monotonically increasing in ρ. Hence, E will always prefer lobbying with C_1 over lobbying with C_2.*

Proof. See Appendix. ∎

The reason as to why the payoff to the coalition between E and C_1 is increasing in the level of ethnic homogeneity derives from the following: the prize to the lobby of E and C_1 is always worth $R\beta$ regardless of how large E_1 is. Start with some feasible level of ρ. Notice that the larger E_1 is (i.e., the larger ρ is, given λ), the greater the chances of the lobby winning the contest against L. In fact, this induces more effort from the lobby and elevates the expected payoff. This is also the rationale behind why E would always prefer teaming up with the *larger* of the two ethnic groups.

Suppose the non-elite decide not to ally with the elite but form a coalition within themselves and lobby against L (i.e., Case (C)). Here, the common payoff to the non-elite citizens is given by

$$\pi_C = \left(\frac{(1-\lambda)\beta^{3/2}R}{1 + (1-\lambda)\beta^{1/2}}\right)\left[1 - \frac{1}{2[1 + (1-\lambda)\beta^{1/2}]}\right]. \tag{4}$$

Finally, we come to the case of joint lobbying by all three groups — what we interpret as 'local democracy' in the empirical analysis. Here the common effort level by the citizens is given by

$$e_D = \frac{\beta^{3/2}R^{1/2}}{1+\beta}.$$

This implies that the per-capita payoff that each citizen receives is given by

$$\pi_D = \left(\frac{\beta^3 R}{1+\beta}\right)\left[1 - \frac{1}{2[1+\beta]}\right]. \tag{5}$$

Equations (1), (2), (3), (4) and (5) hold the key to understanding which of the possibilities will obtain in equilibrium.

OBSERVATION **2.** *For any given level of taste diversity β, there is a threshold value of λ — call it $\overline{\lambda_\beta}$ — such that group C would prefer to lobby by themselves rather than also include the elite whenever $\lambda < \overline{\lambda_\beta}$.*

Proof. See Appendix. ∎

The intuition behind the above result is the following. Fix the level of taste diversity at any feasible $\beta \in (0, 1)$. When the non-elite are not particularly small (λ smaller than but close to $1/2$) then the expected payoff from lobbying alone for group C is not very high given that the total effort required to generate sufficiently high chances of getting their preferred public goods is large (and hence costly). Here, it makes sense to try coordinating jointly with the elite, rather than just cooperate within themselves. As the mass of the elite starts to reduce (λ starts falling), then the added benefit of having them contribute to the common cause starts to outweigh the cost in terms of utility drop (the "compromise" effect via dilution of the prize by a factor of β).

This brings us to the issue of how taste diversity, as captured by the parameter β, affects the nature of lobbying in equilibrium. It turns out that if tastes are sufficiently diverse (β lower than a threshold), democratic lobbying is likely to be superseded by the elite pairing up with the larger of the two ethnic groups. The following result states this more formally.

OBSERVATION **3.** *If taste diversity is sufficiently high, i.e., β is below a threshold, then democratic lobbying is not observed in equilibrium, regardless of the size of the elite.*

Proof. See Appendix. ∎

To gain an intuition for the result in Observation 3, consider the trade-off group E faces between choosing to pair with C_1 and lobbying democratically. In the latter case, the chances of success are potentially higher but the prize is clearly lower, being discounted by β. This is true *regardless of the size of the elite*. Therefore, when taste disparities are significant — β is "low" — the expected gains for E are higher when aligned with C_1 alone rather than lobbying democratically; the prize is too "diluted" when shared with everybody.

Next, we fix the size of the elite and analyse the effect of increasing ethnic diversity — so changing the relative sizes of C_1 and C_2 by varying ρ. It turns out that the effect is quite complex, unlike the one for taste diversity. However, one can identify certain clear patterns, which also are entwined with the extent of taste diversity. The following results makes this more explicit.

OBSERVATION **4.** *An increase in ethnic diversity, i.e., letting ρ approach $1/2$ from above, has — in general — an ambiguous effect on democratic lobbying. If however ethnic diversity is sufficiently low (ρ "close" to 1), then a fall in ρ increases the chances of elite oligarchy (hence, a movement away from democracy) for a range of feasible values of β. Moreover, this is more likely the lower β is (while remaining within the aforementioned range).*

Proof. See Appendix. ■

Observation 4, in effect, contains three specific results. They can be summarised as:

(i) the general ambiguity in regard to the effect of changes in ρ on equilibrium lobbying;
(ii) how this ambiguity is resolved in the case of highly ethnically homogeneous communities — specifically, more diversity leads to a movement away from democratisation; and,
(iii) how the ambient level of taste diversity affects the relationship noted under point (ii).

Part (i) can be understood from dwelling on the scenarios where the equilibrium lobby group is either E alone (pure elite oligarchy) or all three groups together (pure democracy). In either of these two (extreme) cases, the payoff to the lobby group is independent of ρ — this is easily checked by consulting equations (1) and (5). In the case of pure democracy, any increase in ethnic diversity (via a lowering of ρ) has *no* effect on equilibrium lobbying, since no two groups can leave this grand coalition and gain. Observe, a coalition of E and C_1 clearly makes a lower payoff from a reduction in ρ (by Observation 1). The payoff to E lobbying alone and to C lobbying collectively are unaffected by changes to ρ. So if pure democracy was the initial equilibrium, it remains so with a lower ρ. Similar reasoning delivers that an initial equilibrium of E lobbying alone is unaffected by any fall in ρ.[10]

In the case of highly ethnically homogeneous communities, for a large range of feasible values of β the equilibrium lobby group is that of E and C_1. This is intuitive since E — rather than lobbying alone — can improve by joining forces with C_1 (which happens to be sizeable as ρ is close to unity) as long as β is not arbitrarily small. Again, since ρ is close to unity C_2 is rather insignificant in size and hence $\pi_{EC_1} > \pi_D$. So now the question is how this might change by a *decrease* in ρ. Notice that a decrease in ρ reduces π_{EC_1} while π_{EA} is unaffected. So if it is the case that $\pi_{EA} > \pi_D$, then the following is likely: a drop in ρ pushes π_{EC_1} below π_{EA} and this results in a movement towards elite oligarchy and away from democracy. This is the core reasoning behind part (ii).

For part (iii) observe that the ambient level of taste diversity (i.e., β) conditions the difference between π_{EC_1} and π_{EA}, with the former increasing in β and the latter being independent of it. Therefore, starting from the initial situation of $\pi_{EC_1} > \pi_{EA}$, notice that the lower β is the smaller is the difference between these two payoffs. Hence, a decrease in ρ pushes π_{EC_1} below π_{EA} more easily when β is small (i.e., high taste diversity).

In sum, which kind of lobbying activity will result in equilibrium clearly depends upon the levels of ethnic and taste diversity, the size of the elite as well as the coordination costs.[11] By focusing on the *conceptual* distinction taste and ethnic diversity, we are able to highlight the asymmetry in their effects on the equilibrium form of lobbying. As recorded in Observation

[10] Interestingly, an increase in ρ may result in a move to E jointly lobbying with C_1 rather than alone.

[11] In equilibrium there will be *some* form of lobbying since no lobbying by any group implies a payoff of zero to all the citizens whereas in all other situations (cases (A) — (E)) the expected payoff to at least one of the groups is positive.

3, a lowering of taste diversity (increase in β) implies a stronger possibility for joint action. However, the effect of increasing ethnic diversity is far more subtle. As noted in Observation 4, higher ethnic diversity could — in general — result in a movement towards or away from local democracy. In the case of low ethnic diversity to begin with, we can outline the scenarios where the ambiguity is clearly resolved. In such cases, increasing ethnic diversity leads to a clear shift away from democratisation. Additionally, the ambient level of taste diversity conditions this relationship.

These nuanced differences, that we uncover, in the effects of ethnic diversity and taste diversity on the dynamics of local democratisation seem amenable to empirical testing. In what follows, we describe how we proceed to test these theoretical predictions in the context of local governance in Indonesia.

3 Empirical Analysis

The theory, although simple, provides a rich set of testable predictions. We focus on the following ones:

(i) Ethnic diversity has an ambiguous effect on joint coordination in general — so democratic spending may increase *or* decrease depending upon other parameters.

(ii) Within societies which are largely ethnically homogeneous, greater ethnic diversity lowers the chances of democratic action — here, elite oligarchy is more likely to arise in communities which are relatively more ethnically diverse. Additionally, this is more likely when the underlying taste diversity is high.

(iii) Taste diversity *per se* unambiguously lowers democratic action.

In the empirical exercise, conformity in taste is proxied by a community's adherence to adat laws that promotes an ethic of mutual cooperation in the community. Taste diversity, in contrast, would be accounted for by an absence of strict adherence to adat norms. Ethnic diversity is measured by the composition of different population groups in the community. This is further explained in the data section below.

3.1 Data

Our analysis is based on the community level data obtained from 1997 and 2007 Indonesian Family Life Survey (IFLS) from 312 rural and urban communities, drawn from 36 districts lying in 13 provinces including Jakarta, Bali, Java (central, east and south), Sumatra (north, west and south), Lampung, West Nusa Tenggara and south Kalimantan. Although IFLS data are available for the years 1993, 1998 and 2000 as well, information on local politics could be found only in the 1997 and 2007 surveys, thus explaining our choice of the sample

years.

This is a particularly rich data set that provides community level information on a whole range of demographic characteristics and access to public goods, local governance and its public finances, citizens' participation in planning and implementation of local development projects, as well as a range of public utilities, infrastructure and transport, health and education facilities (see Frankenberg and Thomas (2000) and Strauss et al. (2009) for study design and overview of the data set).

3.2 Background

	1997		**2007**	
	Rural	Urban	Rural	urban
Consensus	38	53	15	18
Voting	64	50	100	78
Oligarchy	18	89	5	96
Total	120	192	120	192

Table 1: Different methods of selection of community leaders. *Notes.* 'Consensus'= 1 if the community leader is selected by consensus building through meetings; 'Voting'=1 if the community leader is elected by voting; 'Oligarchy'=1 if the community leader is selected by few elites.

With the introduction of the '1979 village law', village affairs were brought under the supervision and close control of higher authorities. While the law stated that the village had "the right to manage its own affairs", it immediately noted that this "does not mean autonomy" (General Clarification, section 7). The village was nothing more and nothing less than "the lowest level of the government structure directly under the sub-district chairman". Since 1979, the head of villages classified as 'desa' has been elected in village-level elections held every 8 years, while the heads of 'kelurahan' villages (urban/city) were appointed by upper levels of administration. These have been the de jure selection rules of community leaders though in practice the process of selection of the community leader may vary (see Table 1). In short, Indonesia has been culturally and politically decentralised nation even though local leader selections may have been controlled by the central regime under Suharto; however, the nation was under the unambiguously tight grips of central fiscal control until 2001.

Fiscal decentralisation in post-Suharto Indonesia was largely an exogenous event for the communities, which has its roots in Law 22/99 and Law 25/99 enacted in January 2001. It gave local communities more autonomy in raising local revenues while enforcing strict budgetary cuts on the central leadership to supply development grants to these communities. It also granted administrative authority to local governments to hire staff and conduct local

government affairs with a minimum intervention of the central government; local community governments were made responsible to the district government who provided the bulk of their funds after FD; in other words the centre of power moved from the central government in Jakarta to the district governments located in district head-quarters after FD. We study these local communities at 1997 and at 2007, two years separated by the introduction of FD in 2001.

3.3 The process of democratisation and joint lobbying

The idea of joint lobbying in the theoretical model is really a proxy for a democratic local level decision-making. Recall, the lobby group encompassing *all* the different factions is the one where the intended spending is for all participants — not simply targeted at any economic or ethnic group. The actual empirical counterpart to this type of spending in the model is not obvious. Clearly, one needs to examine certain types of general public spending which one may expect to occur naturally in a democratic setup. The following section discusses this in some detail.

3.3.1 Measures of local development

The composition of public spending and public goods has become the key instrument for policies for economic development (IMF and World Bank 2003). In recent years, development assistance to heavily indebted poor countries has been made conditional on increase on certain categories of public spending that are thought to be pro-poor. In particular, components of public spending aimed at reducing poverty levels focuses on education, health, agriculture, safety nets, infrastructure, rural development and others (IMF and World Bank 2003). This practice has its roots in the works of Aschauer (1989), Barro (1991), Easterly and Rebelo (1993), Devarajan et al. (1996). Aschauer (1989) argued that investment in core infrastructure like streets, railways, airports has the most explanatory power for private sector productivity in the United States. Along similar lines Easterly and Rebelo (1993) suggested that public investment in infrastructure boosts economic growth. Barro (1991) further argued that productive spending on education (which develops human capital) and defence (which protects property rights) are growth enhancing. In this respect, a distinction is often made between social and physical infrastructural goods. While investment in physical (e.g., transport and communications) infrastructure will facilitate production of both goods and services, investment in health and education will contribute to healthy and educated workers, and thereby improve labour productivity.

Fiscal decentralisation of 2001 had offered more autonomy in local spending (and not in revenue collection) and the delivery of public services including health, education and physical infrastructure (Brodjonegoro, 2001). IFLS data provides information on the spending

allocation of the local community government in both 1997 and 2007 rounds. Total spending has the following components: (i) development spending refers to spending on new social (e.g., local schools and health centres) and physical (e.g., roads and transport) infrastructure as well as maintenance of existing infrastructure; (ii) non-development spending includes spending on staff salary, office maintenance, official trips and contingencies; (iii) some under-developed communities also receive grants for various developmental programs, e.g., IDT for under-developed communities.

The selection of communities for the Inpres Desa Terttingal (IDT) program is made by the National Development Planning Agency (BAPPENAS) and the Ministry of Home Affairs (MoHA) and it is based on the PODES socioeconomic survey by the Central Bureau of Statistics. The 1994 selection considered three basic indicators: village facilities and potential, housing and the environment and population characteristics. The selection criteria however had some flaws for identifying consumption levels; for instance, too much weight was given to infrastructure deficiencies that do not always reflect lowest consumption levels-and thus the selection for the 1995 program gave more prominence to expenditure levels. Also number of households in the community determined how often these communities would be selected for IDT funds. Under IDT, the government, by virtue of presidential instructions, provided selected poor communities (or villages) with lump-sum grants designated for small business loans. These selected villages were then instructed to choose relatively poor households that would be eligible for IDT loans based on village-level meetings. These were facilitated by the village head and a local government agency called Lembaga Ketahanan Masyarakat Desa (LKMD, Village Community Resilience Board). About 40% of the communities have been selected for the anti-poverty programme IDT in our sample.

Accordingly, our key index of local development is the natural logarithm of annual development spending (labelled as *devexp*) for each community, which include funds from IDT. We also check the robustness of these estimates by considering the natural logarithm of communitys annual spending on social infrastructure (labelled as *socexp*) and also that on physical infrastructure (labelled as *infraexp*).

3.3.2 Local leadership

Another way to interpret 'joint lobbying' is to consider the environment within which the local level decision-making takes place. Is it decided on the basis of general discussion amongst all citizens or is it decided unilaterally by one individual or a clique?

The 1997 and 2007 rounds of the IFLS asked community leaders about how a leader was selected, which we use to classify these communities. Answers to this question are coded as: (i) voting, (ii) all residents, (iii) local elites, (iv) local institutions and (v) others. Under voting (code (i) and (ii)), the standard notion of plurality was employed where the voters were local community residents. Otherwise, local leadership was determined by the choice

of local elites (code (iii)) or by existing officials of local government bureaucracies (code (iv)). However it is not clear as to how others (code (v)) selected the local leader, and so we exclude these communities from our analysis. Accordingly, we classify local politics as follows: "democratic" if a leader is selected by free and fair elections with voters being all community members (code (i) and (ii)), and "oligarchic" if a leader is selected by community elites (codes (iii) and (iv)) who then remain uncontested. This classification closely follows that pertaining to the elected and the appointed leaders in Martinez-Bravo (2014). In particular, democratically elected leaders are the 'elected' leaders while oligarchic ones correspond to the 'appointed' category in Martinez-Bravo (2014). We assume that the incidence of oligarchies reflect the salience of elite capture.

Table 1 summarizes the methods of selecting a community leader in our sample in 1997 and also in 2007, which in turn highlights the fact that the de facto selection process may differ from de jure selection rules. In general, a slightly higher proportion of sample communities adhered to voting and consensus building in 2007 than in 1997. Also, a higher proportion of rural communities adhered to democracy while a higher proportion of urban communities adhered to oligarchy in both years. To a large extent this was the result of Village Law 1979 which retained the power of the government to select leaders for urban communities.

One can argue that the concept of joint lobbying is linked to the idea of local-level voting in our sample. In particular, using the information on leader selection from 1997 and 2007 rounds of IFLS data, we generate an index of democratisation as follows:

$StatusV = 1$ if the community selected a leader by voting or consensus building in both 1997 and 2007 or it became so only in 2007; it is zero otherwise. As such, we use this binary variable $StatusV$ as an index of joint lobbying.

3.3.3 Community Co-ordination and Adherence to Adat norms

Adat law was recognised by the colonial administration in the Dutch Indies as part of a dual legal system in which natives were subject to 'their own religious laws, institutions and customs so far as they were not in conflict with generally recognized principles of equity and justice ...' (Fasseur 2007). In an effort to promote national unity, the post-colonial Suharto regime took a more heavy-handed approach, and 'no political rights were allowed to follow from cultural difference or ethnic identity' (Davidson and Henley, 2007: Chapter 1). Over time, the new system of local governance introduced by the Suharto regime, including administrative bodies at the district and community level, significantly undermined the authority of adat leaders and their ability to enforce adat rules (Kato 1988). Nevertheless, adat law remained salient and relevant, especially to rural life in Indonesia during the Suharto regime.

Based on the knowledge and information of a local expert, the Indonesian Family Life Surveys (IFLS) classified all communities in terms of their 'adherence to adat laws'. In nearly 80% of

	1997 (% of total communities)		2007 (% of total communities)	
	Rural (desa)	Urban (kelurahan)	Rural (desa)	Urban (kelurahan)
Adat laws are never broken	38.41	24.81	28.69	21.63
Adat laws are sometimes broken	40.58	51.13	35.25	23.56
Adat laws are frequently broken	1.45	3.76	9.84	20.67
Only a few understand Adat laws	19.57	19.55	26.23	34.13

Table 2: Adherence to Adat laws. *Sources and Notes.* Percentages are based on responses to questions in the community questionnaire in IFLS2 and IFLS4 regarding the extent to which community members follow adat laws.

rural communities and 75% of urban communities, adat laws were reported to be 'feared' and sometimes or 'almost never broken' in the 1997 survey. Using the same dataset, Bandiera and Levy (2011) find a strong correlation (73%) between community governance according to adat law and current practice. In the following years, Indonesia witnessed major economic and political changes, including the East Asian Financial crisis, the end of the Suharto regime and the beginning of the process of fiscal decentralisation. By 2007, adherence to adat laws appear to have declined significantly with 61% of rural communities and 45% of urban communities reporting that they were 'feared' and 'sometimes broken' or 'almost never broken'.

The IFLS data place each community into one of four possible categories: (i) traditional laws are almost never broken; (ii) traditional laws are sometimes broken; (iii) traditional laws are frequently broken and (iv) only a few people understand traditional laws. We classify a community as an adat community if adat laws are 'almost never broken'; it is a non-adat community otherwise. Table 2 summarises the adherence to adat laws in rural and urban communities in 1997 and 2007. Overall, a smaller proportion of sample communities adhered strictly to adat law in 2007 than in 1997.

Adat rules generally prescribe how each community member should contribute to collective activities as well as the punishment for falling short of these prescriptions. Therefore, we argue that communities where adat rules are generally ignored or forgotten, cooperation in traditional collective activities are also weak.

Table 3 summarises the IFLS data which provides a snapshot of the nature and range of these activities. As shown in the table, in about 85% of the surveyed communities, there was, according to 'traditional law', at least one community group that relied on an ethic of mutual cooperation for activities related to security, food security, health, education, construction and infrastructure, and assistance to community members. In over 80% of the communities, the 'traditional law' prescribed community activities to assist community members in difficulty through disbursement of money, food or public service. Similar proportions were

	1997 % of communities with mutual cooperation groups			2007 % of communities with mutual cooperation groups		
	ADAT=1	ADAT=0	T-stat	ADAT=1	ADAT=0	T-stat
Rural	94.23	76.47	2.5350**	100	100	-
Urban	93.93	88.66	0.8691	100	94.21	1.6339

	1997 % of communities with coop groups for community infrastructure			2007 % of communities with coop groups for community infrastructure		
	ADAT=1	ADAT=0	T-stat	ADAT=1	ADAT=0	T-stat
Rural	41.51	27.06	1.7684*	95.4	91.43	0.8492
Urban	18.18	13.53	0.6764	95.56	89.02	1.3235

Table 3: Mutual Cooperation across Adat and non-Adat Communities *Sources and Notes.* Mutual cooperation groups refer to community groups that make use of an ethic of mutual cooperation for various collective activities relating to security, health, education, infrastructure projects, assisting community members in difficulty, etc. See Bowen (1986) for further information. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

reported for 'current practice' regarding these groups and activities. As such Table 3 shows the correlation between a community's adherence to adat laws and mutual co-operation activities. Accordingly, we use the extent of a community's adherence to traditional adat rules as a measure of its cooperation in collective activities that lowers co-ordination costs and promotes taste uniformity.

3.3.4 Ethnic diversity

We observe the size of the top three ethnic groups in each sample community which we use to construct two alternative indices of ethnic diversity which are commonly used in the literature. Our first measure is labelled as $Frac1$ which is measured by the inverse of the largest ethnic group. The larger the size of the largest ethnic group, the lower is the extent of ethnic diversity measure $Frac1$ and vice versa. We also generate an alternative measured labelled $Frac2$ which is defined as follows: $Frac2 = 1 - \sum p_i^2$ where p_i is the population share of the i–th group, for $i = 1, 2, 3$. In this case too, the larger the sum of squares of the three population shares, the smaller will be the extent of ethnic diversity measure $Frac2$.

3.4 Empirical strategy

We aim to assess the effect of different types of diversity — ethnic and taste — on the incentives for fostering local democratic processes following fiscal decentralisation. The dependent variable takes two main forms. One is democratisation at the local level — namely, the method by which the local leader is chosen. The other is the consequent effect on development spending.

This motivates the following empirical specification for community i in year t:

$$Y_{it} = b_0 + b_1 FD_t + b_2 StableAdat_i + b_3 EthnicDiversity_i + b_4 StableAdat_i * FD_t$$
$$+b_5 EthnicDiversity_i * FD_t + b_6 EthnicDiversity_i * StableAdat_i * FD_t + bX_{it} + u_{it}$$

Specifically, Y takes the following forms:

(i) The dummy variable for local democratisation, namely, $StatusV$ which takes the value 1 if the community selected a leader by voting or consensus building in both 1997 and 2007 or it became so only in 2007; it is zero otherwise.

(ii) A set of developmental outcomes in the community including development spending (*devexp*) and IDT, spending on social (socexp), on physical infrastructure (infraexp). Note that spending on social and physical infrastructure are two components of total development spending in a community in a year.[12] These spending items are likely to generate investment in essential public goods, both physical infrastructure like roads and transport and social infrastructure like health and education facilities, which are likely to boost local development. Here, our flagship dependent variable is the natural log of (1+ total development spending in the community including IDT). We also report results with the share of development spending (at the community level) — denoted by *shdev* — as an additional metric of general welfare spending.

In order to capture the extent of taste diversity, we utilise whether the community had a stable adherence to traditional adat laws or not. In particular, we construct a binary variable *StableAdat* that takes a value 1 if a community strictly adhered to adat laws in both the sample years 1997 and 2007; it is 0 for others.

Traditional institutions like adat laws have, historically, played an important role in community life in Indonesia, up to and during the colonial period. It follows from our earlier discussion that communities where adherence to adat laws was strong, community members were expected to participate in, and could expect to benefit from, a range of collective activities and this is the traditional practice. A community's adherence to adat laws is thus determined by the age-old traditions (rather than by current community governance

[12]The rest of the total community spending is spent on wages and salaries of community staff, their travels and other administrative items.

structure), thus making our chosen measure of taste diversity ($StableAdat$) exogenous.

It follows from Table 2 that a community's adherence to adat laws declined between 1997 and 2007, which reflects the strategic nature of this choice by sample communities. In order to avoid this aspect of strategic choice, we use $StableAdat$ so as to ensure that there has been no change in adherence to adat laws in these communities. Given that FD offered more autonomy to these communities, we also interact the stable adat variable with the FD2007 dummy. This is guided by our theoretical model, which relies on the premise that fiscal decentralisation *raises the stakes for the community members to lobby* (either individually or collectively). The precise nature of lobbying (democratic/oligarchic, etc.) as we argue in Observations 1 — 4 , depends crucially on the *extent of taste diversity in the community*, an issue closely linked to whether a community ascribes to Adat laws.

We use two different measures of ethnic diversity. In line with our model, ethnic diversity is closely related to the size of the largest ethnic group — this motivates our first measure $Frac1$ which is simply the inverse of the size of the largest ethnic group. We also employ an alternative definition of diversity, which we call $Frac2$, which takes into account the sizes of the top three ethnic groups (this measure has been defined precisely earlier).

The set of other control variables X include a number of community-level variables used in the analysis include the population and the geographic area of the community, binary variables indicating whether it is urban and also the distance of the community from the district headquarters. Finally, we consider a number of basic infrastructural goods that could directly impact on sustainable livelihoods and provide opportunities for all, especially for the poor members of the community.

FD2007 takes a value 1 for year 2007 and 0 for 1997. In view of our hypothesis (iii), the coefficient of particular interest to us would be the estimated coefficient of the interaction term (FD2007=1)*($StableAdat = 0$). The latter accounts for the effect of FD in non-adat communities (characterised by taste diversity) on the likelihood of democratisation *and* the extent of local development spending after the introduction of FD.

Table 4 summarises the summary statistics of all the regression variables. For hypotheses (i) and (ii), we consider the coefficient estimate of the index of ethnic diversity interacted with the FD2007 dummy and the Adat dummy to assess its impact on the likelihood of democratisation. Given that share of population groups change only slowly, the value of ethnic diversity variable is relatively stable in our sample spread over a period of ten years.

Note, the identification strategy relies on the following factors. First, as argued earlier, FD was imposed by the central government and as such was beyond the influence of local communities in Indonesia. Secondly, the measure of ethnic diversity is relatively stable in our sample communities and is therefore unlikely to give rise to any simultaneity between community democratisation/development. Finally, we consider a community's stable adherence to adat/non-adat rules over time, thus minimising the potential estimation bias arising from

Variable definitions	Variable abbreviation	Obs	Mean	std. Dev.	Min	Max
Index of political transition	StatusV	624	0.6763	0.4683	0	1
Log of total development spending	lDevexp_idt	620	15.7141	6.7593	0	22.8027
Share of development spending	Shdev	602	0.5155	0.358	0	1
Share of spending on social infra	Shsoc	624	0.077	0.1393	0	1
Share of spending on physical infr	Shinfra	624	0.1746	0.3004	0	1
Size of the largest ethnic group $\geq 91\%$	Pop1_91	624	0.5096	0.5003	0	1
Ethnic diversity: Frac1	Frac1	613	0.0133	0.0063	0.01	0.1111
Ethnic diversity: Frac2	Frac2	613	0.2298	0.2501	-0.9018	0.9757
Taste diversity: non-adat	Nonadat	624	0.7419	0.4379	0	1
1 if the head has at least high sch	Headshs	624	0.8077	0.3944	0	1
1 if the head lives in the commuty	HeadinvD	624	0.7115	0.4534	0	1
log of community population	Lvpop	622	8.7778	0.9855	5.5452	12.2356
log of community area in hectares	Lvsize	619	5.6898	1.7923	0.0296	20.7232
Inverse of largest population group	Inv_Pop1	613	0.0133	0.0063	0.01	0.1111
1 if it is in urban area	Urban	624	0.5881	0.4926	0	1
Distance from the district HQ in miles	Disdhq	624	4.5442	8.9741	0	112
1 if the dominant religion is Islam	Islam	624	0.8333	0.3729	0	1
Composite index of road and trans	pcinfra	624	-0.001	1	-2.5052	1.3055
Govt. schools per head	Gov_sch_pc	624	1.53	2.4766	0	27.34
Govt. health centres per head	Gov_hlth_pc	624	1.51	1.564371	0.0291	23.077

Table 4: Summary Statistics of Regression Variables.

any simultaneity between adherence to adat and democratisation/local development.

3.5 Results

The main results are summarised in Tables 5, 6 and 7.

Table 5 shows the estimates of the likelihood of democratisation and Table 6 summarises the estimates of local development. Next, Table 7 shows the heterogeneous impact of diversity (ethnic and taste) on local development depending on whether the size of the largest population group is above or below its median value of 91% as measured by the binary variable *pop*1_91. We also test the robustness of our estimates to our measure of ethnic diversity in this case — some such results are reported in Table 8.

3.5.1 Likelihood of democratisation

Given that decentralisation did not necessarily give rise to democratisation in all sample communities, we start with the estimates of the likelihood of democratisation. The logit estimates of democratisation after the introduction of fiscal decentralisation are summarised in Table 5. The dependent variable is *Status_v* that takes a value 1 if the community is democratic (old or new) and 0 otherwise. Column 1 shows the estimates without any region fixed effect; column 2 and column 3 respectively include province and district FEs.

In all the three specifications, we find that the coefficient on the interaction term $FD2007 * pop1\_91$ is positive. Moreover, it is also statistically significant, controlling for all other factors, in columns 1 and 3. This is consistent with the idea (consult Observation 4) that low ethnic diversity leads towards local democratisation (or away from elite oligarchy).

Additionally, we find that the triple interaction term $Stable\_adat * FD2007 * pop1\_91$ is negative and highly statistically significant, controlling for all other factors. Remember that $Pop1\_91$ is a binary variable that takes a value 1 if the size of the largest population group is 91% (which is also its median value) or more in the community; hence in this case, the level of ethnic diversity is low. This supports the other statement in Observation 4, namely, that the effect of movement *away* from oligarchy in ethnically homogeneous communities — as captured by the positive coefficient on the interaction term $FD2007 * pop1\_91$ — is *more* pronounced in places where taste diversity is high (i.e., $Stable\_adat = 0$).

3.5.2 Estimates of local development

Table 6 shows the estimates of local development for the communities with some level ethnic diversity. Note that about 25% of all communities comprised of only one ethnic group. In order to understand the role of diversity, we therefore choose the communities where the largest ethnic group's size is *less* than 100%. As mentioned before, we use two possible indices of local development: (i) logarithm of all community spending on development, labelled as $lDevexp\_idt$; (ii) share of development spending in total community spending, labelled as $shdev$. Columns (1) and (2) show the estimates of local development using the ethnic diversity measure Frac1 while columns (3) and (4) show those using the alternative ethnic diversity measure $Frac2$. Note that the binary variable $Nonadat$ is the complete opposite of $stable\_adat$: while $stable\_adat$ indicates taste homogeneity, $nonadat$ indicates taste diversity.

The effect of taste diversity ($Nonadat = 1$) serves to deter spending on local development — hence, suggestive of elite oligarchy — as can be seen in the negative coefficients on $Nonadat$ in all the columns. This is partially mitigated post-decentralisation as the positive coefficient on $Nonadat * FD2007$ indicates. However, the effect continues to be adverse for ethnically diverse communities as can be noted from the sign and significance of the triple interaction term $Nonadat * FD2007 * Frac1$. This term is negative in both columns (1) and (2), indicating the detrimental of effects of the *combination* of ethnic and taste on local development, as noted in Observation 4. Note, however, that the effect is statistically significant only for total development spending $lDevpexp\_idt$ rather than share of development spending as in column (2). Columns (3) and (4) using the alternative ethnic diversity measure $Frac2$ confirms the robustness of our estimates shown in columns (1) and (2).

An entirely analogous pattern emerges for ethnic diversity — note, the sign and significance of the coefficients on $Frac_i$ and $Frac_i * FD2007$ (for $i = 1, 2$) in all the columns in the table.

VARIABLES	No region FE (1) status_v	Province FE (2) status_v	District FE (3) status_v
Pop1_91	0.3041	0.3188	-0.0700
	(0.330)	(0.440)	(0.378)
Stable_adat1	-1.0239	-1.5459**	-16.2925***
	(0.756)	(0.771)	(0.890)
FD2007	0.3634	0.4499	0.3265
	(0.352)	(0.383)	(0.257)
Stable_adat1*_Pop1_91	16.2144***	17.5161***	30.8876***
	(1.062)	(1.432)	(1.288)
FD2007*Pop1_91	0.9879**	0.7683	0.8545**
	(0.460)	(0.472)	(0.432)
Stable_adat1*FD2007	0.5099	0.2618	-0.1871
	(1.256)	(1.109)	(1.221)
Stable_adat1*FD2007*Pop1_91	-15.7393***	-16.3477***	-14.3227***
	(1.773)	(1.661)	(1.702)
Headshs	-0.4881	-0.6193**	-0.4644
	(0.356)	(0.300)	(0.436)
HeadinvD	1.9806***	1.8698***	1.7164***
	(0.363)	(0.360)	(0.416)
Disdhq	0.0359	0.0720	0.0348
	(0.039)	(0.052)	(0.055)
Lvpop	-0.5338***	-0.4410**	-0.4589**
	(0.190)	(0.213)	(0.224)
Lvsize	0.2948***	0.3493***	0.1781
	(0.107)	(0.133)	(0.112)
Urban	-1.5586***	-1.7007***	-1.0077**
	(0.363)	(0.495)	(0.495)
Sea	0.2945	0.1198	0.9535***
	(0.201)	(0.236)	(0.230)
Constant	3.3752**	3.7139**	3.3286*
	(1.643)	(1.688)	(1.856)
Observations	618	618	449

Table 5: Diversity and local democratisation: Logit estimation. *Notes.* The dependent variable in columns (1)—(3) is *Status_V*. The first column does not have any regional dummies while the other two utilise province and district dummies, respectively. Robust standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

VARIABLES	(1) lDevexp_idt	(2) shdev	(3) lDevexp_idt	(4) shdev
Nonadat	-22.1232***	-1.4438***	-2.8498	-0.2882**
	(6.933)	(0.345)	(2.253)	(0.122)
Frac1	-1,963.6299***	-119.1724***		
	(536.244)	(26.095)		
FD2007	-15.7475	-1.0184	1.6665	-0.4765*
	(9.881)	(0.711)	(3.097)	(0.249)
Nonadat*Frac1	1,940.5075***	117.1705***		
	(533.266)	(25.463)		
Nonadat*FD2007	20.7355**	0.9149	3.1196	0.3749
	(9.665)	(0.700)	(2.823)	(0.243)
Frac1*FD2007	1,801.1953**	55.3399		
	(751.794)	(52.234)		
Nonadat*FD2007*Frac1	-1,831.4623**	-51.5648		
	(749.593)	(52.018)		
Ethnic diversity 2: Frac2			-21.4893***	-1.3766***
			(6.781)	(0.331)
Nonadat*Frac2			17.7694***	1.1241***
			(6.472)	(0.298)
Frac2*FD2007			17.5312**	0.4428
			(8.376)	(0.680)
Nonadat*FD2007*Frac2			-18.2526**	-0.2825
			(8.206)	(0.684)
Constant	30.1985***	2.0456***	10.2065*	0.8635***
	(9.146)	(0.410)	(5.570)	(0.236)
Other controls	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes
Observations	437	421	437	421
R-squared	0.253	0.138	0.265	0.150

Table 6: Diversity and local development spending. *Notes.* The sample is restricted to those communities which are not entirely ethnically homogeneous. The dependent variable in columns (1) and (3) is $lDevexp\_idt$, while the one in columns (2) and (4) is $shdev$. The first two columns utilises $Frac1$ as the measure of ethnic diversity while $Frac2$ is the measure used in columns (3) and (4). Taste diversity is measured by $Nonadat$ in all the columns. Robust standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

3.5.3 Heterogeneous impact on local development

In Table 7, we examine the heterogeneous impact of diversity, if any, in our sample depending on whether the size of the largest ethnic group is below or above the median value, as captured by the binary variable $Pop1\_91$. Columns (1)—(3) show the estimates for total development spending while columns (4)—(6) show those for share of development. Using the ethnic diversity measure Frac1, column (1) shows the estimates of the full sample and contrast these with those for the subsamples $pop1\_91 = 1$ (at or above median) and $pop1\_91 = 0$ (below median), as seen in columns (2) and (3).

As noted in the baseline table — Table 6 — the effects of taste diversity on such local development is typically adverse, as evidenced by the negative coefficients on $Nonadat$ in all the columns. This is somewhat overcome post-decentralisation as the positive coefficient on $Nonadat * FD2007$ indicates. However, the effect continues to be adverse for ethnically diverse communities as can be noted from the sign and significance of the triple interaction term $Nonadat * FD2007 * Frac1$ when $pop1\_91 = 0$ (see column (3)). In other words, communities with both taste and ethnic diversity tend to have lower development spending when the size of the largest population group is below its median value. However the corresponding effects remain statistically insignificant in columns (1) or (2). We get similar results when we consider the alternative share of development spending measure. As before the triple interaction term $Nonadat * FD2007 * Frac1$ is negative and statistically significant only when $pop1\_91 = 0$.

Further, Table 8 test the robustness of Table 7 estimates using the alternative ethnic fractionalisation index $Frac2$. As in Table 7, the triple interaction term is negative and statistically significant only when $pop1\_91 = 0$ and this holds irrespective of whether we use total development spending (column 3) or its share (column 6).

An entirely analogous pattern emerges for ethnic diversity — note, the sign and significance of the coefficients on $Frac_i$ and $Frac_i * FD2007$ (for $i = 1, 2$) in all the columns in these two tables.

Taking stock of all these results, we can infer the following:

(i) In general, diversity — be it ethnic or taste — tends to reduce general development spending, although there is a general uptick post-decentralisation.

(ii) The increase in such spending (post-decentralisation) is largely mitigated in those communities which are both ethnically and taste-wise diverse (follows from the sign and significance of the triple interaction term $Nonadat * FD2007 * Frac_i$, where $i = 1, 2$).

(iii) The effects are the strongest in a sample of communities which are fairly but not *completely* ethnically homogeneous.

VARIABLES	All (1) lDevexp_idt	Pop1_91=1 (2) lDevexp_idt	Pop1_91=0 (3) lDevexp_idt	All (4) shdev	Pop1_91=1 (5) shdev	Pop1_91=0 (6) shdev
Nonadat	-10.4424	-123.3781	-37.0102***	-0.6630*	-4.7321	-2.0202***
	(8.278)	(129.781)	(9.626)	(0.394)	(5.209)	(0.487)
Frac1	-1,186.8800*	-9,395.6493	-2,943.8023***	-65.4581**	-217.7365	-151.9211***
	(649.727)	(13,189.532)	(654.090)	(32.220)	(532.716)	(28.951)
FD2007	-4.2173	-70.2384	-36.9736***	0.0982	-2.3309	-2.4853***
	(8.540)	(134.009)	(10.148)	(0.494)	(8.525)	(0.482)
Nonadat*frac1	1,135.3571*	12,519.3528	3,028.8137***	61.0610*	473.8831	156.7424***
	(664.082)	(12,852.550)	(667.140)	(32.116)	(512.213)	(30.363)
Nonadat*FD2007	8.5701	128.7477	43.7785***	-0.2642	3.7585	2.5035***
	(8.696)	(130.041)	(10.378)	(0.499)	(8.495)	(0.506)
Frac1*FD2007	912.0559	7,598.1101	3,390.8168***	-29.7699	217.9182	159.1513***
	(688.021)	(13,263.939)	(774.124)	(41.125)	(846.232)	(30.951)
Nonadat*FD2007*Frac1	-914.6887	-13,055.3369	-3,504.5731***	36.0871	-375.6035	-160.8794***
	(700.378)	(12,885.016)	(785.181)	(41.364)	(842.842)	(32.194)
Constant	21.2735**	110.6203	37.3592***	1.2915***	2.8561	2.2667***
	(9.281)	(132.960)	(12.012)	(0.455)	(5.364)	(0.519)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605	304	301	586	297	289
R-squared	0.228	0.268	0.295	0.116	0.179	0.179

Table 7: Diversity and local development spending: Heterogeneity exercises. *Notes.* Here we split the sample in different ways. In columns (1) and (4), the entire sample of communities is utilised, including those which are completely ethnically homogeneous. In columns (2) and (5), the sample is restricted to those communities which are almost ethnically homogeneous — specifically, in these communities the size of the largest ethnic group is at least 91%. In columns (3) and (6), the sample is restricted to those communities which are more ethnically hoterogeneous — specifically, in these communities the size of the largest ethnic group is smaller than 91%. The dependent variable in columns (1)—(3) is $lDevexp\_idt$, while the one in columns (4) through (6) is *shdev*. All the regressions in this table utilise $Frac1$ as the measure of ethnic diversity while taste diversity is measured by *Nonadat*. Robust standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

VARIABLES	All (1) lDevexp_idt	pop1_91=1 (2) lDevexp_idt	Pop1_91=0 (3) lDevexp_idt	All (4) shdev	pop1_91=1 (5) shdev	Pop1_91=0 (6) shdev
Nonadat1: taste diversity	1.5622	2.3641	-13.4918***	-0.0157	0.0526	-0.8223***
	(2.212)	(2.666)	(4.202)	(0.108)	(0.137)	(0.218)
Frac2: Ethnic diversity	-11.1821	-48.2955	-44.2144***	-0.6608*	-0.9589	-2.3120***
	(7.757)	(73.242)	(7.593)	(0.380)	(2.943)	(0.361)
FD2007	4.8437**	5.7643**	-10.6199***	-0.1825	-0.1505	-1.2693***
	(2.263)	(2.600)	(3.746)	(0.128)	(0.150)	(0.215)
Nonadat1*Frac2	6.4360	47.0232	45.6146***	0.3487	0.7726	2.4166***
	(8.024)	(73.666)	(8.212)	(0.375)	(3.005)	(0.363)
Nonadat1*FD2007	6.4360	47.0232	45.6146***	0.3487	0.7726	2.4166***
	(8.024)	(73.666)	(8.212)	(0.375)	(3.005)	(0.363)
Frac2*FD2007	8.0243	38.4182	50.7128***	-0.4608	0.8992	2.4248***
	(7.919)	(73.827)	(10.582)	(0.466)	(4.739)	(0.453)
Nonadat1*FD2007*Frac2	-7.3075	-50.6591	-57.8620***	0.6931	-0.2027	-2.4631***
	(8.049)	(74.002)	(10.980)	(0.469)	(4.821)	(0.487)
Constant	8.4084*	16.3169***	13.9568*	0.5921***	0.6417**	1.1021***
	(4.551)	(5.425)	(8.133)	(0.208)	(0.280)	(0.356)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	513	256	257	499	250	249
R-squared	0.262	0.254	0.349	0.147	0.201	0.196

Table 8: Diversity and local development spending: Heterogeneity exercises (robustness). *Notes.* Here we split the sample in different ways. In columns (1) and (4), the entire sample of communities is utilised, including those which are completely ethnically homogeneous. In columns (2) and (5), the sample is restricted to those communities which are almost ethnically homogeneous — specifically, in these communities the size of the largest ethnic group is at least 91%. In columns (3) and (6), the sample is restricted to those communities which are more ethnically hoterogeneous — specifically, in these communities the size of the largest ethnic group is smaller than 91%. The dependent variable in columns (1)—(3) is $lDevexp\_idt$, while the one in columns (4) through (6) is *shdev*. All the regressions in this table utilise $Frac2$ as the measure of ethnic diversity while taste diversity is measured by *Nonadat*. Robust standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

These empirical patterns resonate well with our theory — in fact, they appear to be consistent with the mechanisms suggested by our theoretical model. Observe in particular, the hypotheses laid out in Section 3 which follow from Observations 3 and 4.

4 Conclusion

We attempted a community-level analysis of the impact of the fiscal decentralisation in Indonesia which came at the end of Suharto's regime. Specifically, we studied how ethnic diversity at the local community level affects the community members ability to reap the gains from decentralisation in the presence of taste diversity as well.

Our theoretical model suggested that there is a subtle difference in the effects of these two types of diversities on the nature of equilibrium lobbying (democratic/oligarchic, etc.). Moreover, both of them, when present simultaneously, serve to reduce democratic spending. In our empirical exercise, we found that either type of diversity makes it harder for local democratisation and this carries over to local development spending as well. Additionally, the *conjoined* effect of these two types of diversities serves to push democratic spending down even further. The empirical findings appear consistent with the mechanisms outlined in our theory, highlighting that fiscal and political decentralisation are not necessarily a panacea for diverse communities. The overall impact of decentralization on community governance and consequent local development in diverse communities depends not only on the nature and extent of fiscal autonomy, but also on the prevailing demographic and institutional features.

It is quite possible that our measures for the two kinds of diversity are correlated and hence we need to explore the subtleties in a more nuanced manner. Nonetheless, we believe that our findings shed new light on an issue which is both policy-relevant and intellectually stimulating.

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Appendix

Derivations of the equilibrium effort levels as in equations (1), (2), (4) *and* (5).

Consider Case (A). Notice that the objective function is strictly concave in e. Here the FOC for E is given by:

$$\frac{\lambda e_L R}{(\lambda e + e_L)^2} = e.$$

Note that the LHS is decreasing in e while the RHS is increasing in e. Also, LHS evaluated at $e = 0$ exceeds RHS evaluated at $e = 0$ whenever $e_L > 0$ (this is satisfied in equilibrium). Hence, there is a unique e which solves the above FOC. Analogous steps yield L's FOC:

$$\frac{\lambda e R}{(\lambda e + e_L)^2} = e_L.$$

Also, here we are guaranteed a unique e_L which solves the above FOC. Solving the two FOCs simultaneously gives us the best-response effort levels. Hence, we get

$$e^* = \frac{\lambda^{1/2} R^{1/2}}{1 + \lambda}$$

and

$$e_L^* = \frac{\lambda^{1/2} R^{1/2}}{1 + \lambda}.$$

Analogous steps generate the corresponding expressions for Case (D).

Next consider Case (B). Here the lobby groups' choose e to maximise the following objective function:

$$\left(\frac{[\lambda + \rho(1-\lambda)]e}{[\lambda + \rho(1-\lambda)]e + e_L}\right) R\beta - \frac{1}{2}e^2.$$

Notice that the objective function is strictly concave in e. Here the FOC for E is given by:

$$\frac{[\lambda + \rho(1-\lambda)]e_L R\beta}{([\lambda + \rho(1-\lambda)]e + e_L)^2} = e.$$

Note that the LHS is decreasing in e while the RHS is increasing in e. Also, LHS evaluated at $e = 0$ exceeds RHS evaluated at $e = 0$ whenever $e_L > 0$ (this is satisfied in equilibrium). Hence, there is a unique e which solves the above FOC. Analogous steps yield L's FOC:

$$\frac{[\lambda + \rho(1-\lambda)]eR}{([\lambda + \rho(1-\lambda)]e + e_L)^2} = e_L.$$

Also, here we are guaranteed a unique e_L which solves the above FOC. Solving the two FOCs

simultaneously gives us the best-response effort levels. Hence, we get

$$e^* = \frac{[\lambda + \rho(1-\lambda)]\beta^{3/4}R^{1/2}}{1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}}$$

and

$$e_L^* = \frac{[\lambda + \rho(1-\lambda)]\beta^{1/4}R^{1/2}}{1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}}.$$

Analogous steps generate the corresponding expressions for Cases (C) and (E).

Proof. [Observation 1.] Note $\pi_{EC_1} = \left(\frac{[\lambda+\rho(1-\lambda)]\beta^{3/2}R}{1+[\lambda+\rho(1-\lambda)]\beta^{1/2}}\right)\left[1 - \frac{1}{2[1+[\lambda+\rho(1-\lambda)]\beta^{1/2}]}\right]$. Also, $\lambda + \rho(1-\lambda)$ is increasing in ρ. Let $f(\rho)$ be defined as follows:

$$f(\rho) = \frac{[\lambda + \rho(1-\lambda)]\beta^{3/2}R}{1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}}.$$

Also, let $g(\rho)$ be defined as follows:

$$g(\rho) = 1 - \frac{1}{2[1 + [\lambda + \rho(1-\lambda)]\beta^{1/2}]}.$$

So we can write π_{EC_1} as follows:

$$\pi_{EC_1} = f(\rho).g(\rho).$$

Straightforward differentiation w.r.t ρ yields that $f'(\rho), g'(\rho) > 0$.
Hence, $\pi'_{EC_1}(\rho)$ which is equal to $f(\rho)g'(\rho) + g(\rho)f'(\rho)$ must be positive since $f(\rho), g(\rho) > 0$.
This completes the proof. ∎

Proof. [Observation 2.] Recall $\pi_C = \left(\frac{(1-\lambda)\beta^{3/2}R}{1+(1-\lambda)\beta^{1/2}}\right)\left[1 - \frac{1}{2[1+(1-\lambda)\beta^{1/2}]}\right]$.
Using arguments similar to those in Observation 1, it is checked that π_C is falling in λ.
Recall $\pi_D = \left(\frac{\beta^3 R}{1+\beta}\right)\left[1 - \frac{1}{2[1+\beta]}\right]$.
Take any $\beta \in (0,1)$. Denote by $\overline{\lambda_\beta}$ the solution to the following equation:

$$\left(\frac{(1-\lambda)\beta^{3/2}R}{1+(1-\lambda)\beta^{1/2}}\right)\left[1 - \frac{1}{2[1+(1-\lambda)\beta^{1/2}]}\right] = \left(\frac{\beta^3 R}{1+\beta}\right)\left[1 - \frac{1}{2[1+\beta]}\right].$$

Notice that by construction, at $\lambda = \overline{\lambda_\beta}$, C_1 is indifferent between lobbying with C_2 alone or lobbying democratically. The LHS is falling in λ since $\pi'_C(\lambda) < 0$. Hence, for any $\lambda < \overline{\lambda_\beta}$, we have $\pi_C > \pi_D$; this rules out democratic lobbying. ∎

Proof. [Observation 3.] Consider the payoff to E when lobbying with C_1.

$$\pi_{EC_1} = \left(\frac{[\lambda+\rho(1-\lambda)]\beta^{3/2}R}{1+[\lambda+\rho(1-\lambda)]\beta^{1/2}}\right)\left[1-\frac{1}{2[1+[\lambda+\rho(1-\lambda)]\beta^{1/2}]}\right].$$

We know from Observation 1, that the above is increasing in ρ.
Now consider $lim_{\rho\to 1}\pi_{EC_1}$ and π_D. Notice,

$$\frac{lim_{\rho\to 1}\pi_{EC_1}}{\pi_D} = \frac{1}{\beta^{3/2}}.\left(\frac{1+\beta}{1+\beta^{1/2}}\right)^2.\left(\frac{1+2\beta^{1/2}}{1+2\beta}\right).$$

The above expression goes to infinity as $\beta \to 0$.
If the above expression is monotonically decreasing in β, then for any $\rho \in [1/2, 1)$, there is a threshold level for β below which π_{EC_1} always exceeds π_D. This follows since π_{EC_1} is monotonic and continuous in ρ.
We will now check if $\frac{lim_{\rho\to 1}\pi_{EC_1}}{\pi_D}$ is indeed monotonic in β.
Re-write $\frac{lim_{\rho\to 1}\pi_{EC_1}}{\pi_D}$ as the following:

$$\frac{lim_{\rho\to 1}\pi_{EC_1}}{\pi_D} = \psi(\beta).\chi(\beta)$$

where

$$\psi(\beta) = \frac{1}{\beta^{1/2}}\left(\frac{1+2\beta^{1/2}}{1+2\beta}\right)$$

and

$$\chi(\beta) = \frac{1}{\beta}\left(\frac{1+\beta}{1+\beta^{1/2}}\right)^2$$

Differentiating $\psi(\beta)$ w.r.t. β yields the following:

$$\psi'(\beta) = \frac{1}{\beta(1+2\beta)^{1/2})}\left[\frac{(1-4\beta-2\beta^{-1/2})}{1+2\beta} - 1 - \frac{1}{2}\beta^{-1/2}\right].$$

As $1-4\beta-2\beta^{-1/2} < 1+2\beta$, we have $\psi'(\beta) < 0$.
Similarly, differentiating $\chi(\beta)$ w.r.t. β yields the following:

$$sign\left(\chi'(\beta)\right) = sign\left(\left[\frac{1}{2}\beta^{1/2}-1\right] - \frac{1}{2}\beta^{-1/2}\right).$$

As $\beta < 1$, the above expression is negative in sign. Hence, $\chi'(\beta) < 0$.
Therefore, $\frac{lim_{\rho\to 1}\pi_{EC_1}}{\pi_D}$ is falling in β since $\psi(\beta)$, $\chi(\beta) > 0$.

This implies that when β is sufficiently small π_D will be dominated by at least π_{EC_1}. Hence, democratic lobbying will not be an equilibrium. This completes the proof. ∎

Proof. [Observation 4.] Suppose the equilibrium lobby group involves E alone. Here the payoff to E is given by $\pi_{EA} = \left(\frac{\lambda R}{1+\lambda}\right)\left[1 - \frac{1}{2(1+\lambda)}\right]$. Observe that this payoff does not depend upon ρ. Moreover, by Observation 1, a fall in ρ reduces π_{EC_1} while leaving π_D unaffected. Then a fall in ρ does not affect the equilibrium lobby — it still involves E alone.

Analogous reasoning yields that when the equilibrium lobby group involves all groups, there is no effect of a fall in ρ (since π_D is independent of ρ).

Now consider the situation where the equilibrium lobby group involves E and C_1. Clearly, this implies $\lambda > \frac{1-\rho}{2-\rho}$. Otherwise, $\pi_C > \pi_{EC_1}$ ruling out the possibility of E and C_1 forming the equilibrium lobby. Next, we compare π_{EA} with π_D.

$$\frac{\pi_{EA}}{\pi_D} = \frac{\left(\frac{\lambda R}{1+\lambda}\right)\left[1 - \frac{1}{2(1+\lambda)}\right]}{\left(\frac{\beta^3 R}{1+\beta}\right)\left[1 - \frac{1}{2[1+\beta]}\right]}$$

which simplifies to

$$\left(\frac{\lambda}{\beta^3}\right)\left(\frac{1+2\lambda}{1+2\beta}\right)\left(\frac{1+\beta}{1+\lambda}\right)^2.$$

Straightforward algebra yields that if $\left(\frac{\beta}{\lambda}\right)^2 > \left(\frac{1+2\beta}{1+2\lambda}\right)$ then $\left(\frac{1+2\lambda}{1+2\beta}\right)\left(\frac{1+\beta}{1+\lambda}\right)^2 > 1$. Moreover, if $\beta = \lambda^{1/3}$, then $\left(\frac{\beta}{\lambda}\right)^2 > \left(\frac{1+2\beta}{1+2\lambda}\right)$ implies $\pi_{EA} > \pi_D$.

Next we show that if $\beta = \lambda^{1/3}$, then $\left(\frac{\beta}{\lambda}\right)^2$ indeed exceeds $\left(\frac{1+2\beta}{1+2\lambda}\right)$.

Notice that we need to show that $\frac{1}{\lambda^{4/3}} > \frac{1+2\lambda^{1/3}}{1+2\lambda}$, $\forall \lambda \in (0, 1/2)$.

Clearly, the LHS approaches ∞ as $\lambda \to 0$ whereas the RHS approaches unity. Define x as $\lambda^{1/3}$. Then the RHS becomes $\frac{1+2x}{1+2x^3}$. Call this expression $f(x)$. Differentiating $f(x)$ w.r.t x yields

$$f'(x) = \frac{2}{(1+2x^3)^2}.[1 - 3x^2 - 4x^3].$$

Notice $f''(x) < 0$ since $x > 0$. Hence the FOC w.r.t x is both necessary and sufficient. Rewrite the FOC as $4x^3 + 3x^2 - 1 = 0$. It is clear that $4x^3 + 3x^2$ is increasing in x. This implies that the solution to the FOC — call it x^* — must be unique. Note that $4x^3 + 3x^2 > 1$ when $x = 1/2$. Therefore, $x^* < 1/2$. Note,

$$f(x^*) < 1 + 2x^* < 1 + 2.(1/2) = 2.$$

However, the LHS at $x = 1/2$ is $\frac{1}{(1/2)^4} = 16$. Additionally, the LHS is falling in λ (and hence, in x). Therefore,

$$LHS(x^*) > LHS(1/2) = 16 > 2 > f(x^*) = RHS(x^*).$$

This implies that $\frac{1}{\lambda^{4/3}} > \frac{1+2\lambda^{1/3}}{1+2\lambda}$, $\forall \lambda \in (0, 1/2)$.

Therefore, we have established that if $\beta = \lambda^{1/3}$, it follows that $\pi_{EA} > \pi_D$.

Since π_{EA} is independent of β and π_D is increasing in β, we can claim that for *any* $\beta \leq \lambda^{1/3}$, it must be that $\pi_{EA} > \pi_D$.

Now compare π_{EC_1} and π_{EA}.

$$\frac{\pi_{EC_1}}{\pi_{EA}} = \frac{\left(\frac{[\lambda+\rho(1-\lambda)]\beta^{3/2}R}{1+[\lambda+\rho(1-\lambda)]\beta^{1/2}}\right)\left[1 - \frac{1}{2[1+[\lambda+\rho(1-\lambda)]\beta^{1/2}]}\right]}{\left(\frac{\lambda R}{1+\lambda}\right)\left[1 - \frac{1}{2(1+\lambda)}\right]}.$$

Notice that as $\rho \to 1$, we have $\lambda + \rho(1-\lambda) \to 1$. Hence,

$$\pi_{EC_1} \to \left(\frac{\beta^{3/2}R}{1+\beta^{1/2}}\right)\left[1 - \frac{1}{2(1+\beta^{1/2})}\right].$$

Next, observe that

$$\left(\frac{\beta^{3/2}R}{1+\beta^{3/2}}\right)\left[1 - \frac{1}{2(1+\beta^{3/2})}\right] > \left(\frac{\lambda R}{1+\lambda}\right)\left[1 - \frac{1}{2(1+\lambda)}\right]$$

whenever $\beta \geq \lambda^{2/3}$.

Notice that

$$\left(\frac{\beta^{3/2}R}{1+\beta^{1/2}}\right)\left[1 - \frac{1}{2(1+\beta^{1/2})}\right] > \left(\frac{\beta^{3/2}R}{1+\beta^{3/2}}\right)\left[1 - \frac{1}{2(1+\beta^{3/2})}\right].$$

Given the monotonicity and continuity of π_{EC_1} in ρ, we can argue that there is some threshold level of ρ — call it $\underline{\rho}$ — such that for any $\rho \geq \underline{\rho}$, we have

$$\pi_{EC_1} \geq \left(\frac{\beta^{3/2}R}{1+\beta^{3/2}}\right)\left[1 - \frac{1}{2(1+\beta^{3/2})}\right].$$

Therefore, we can claim that for any $\rho > \underline{\rho}$, $\pi_{EC_1} > \pi_{EA}$ whenever $\beta \geq \lambda^{2/3}$.

Combining with our earlier results, we have:

$$\pi_{EC_1} > \pi_{EA} > \pi_D$$

whenever $\rho > \underline{\rho}$ and $\beta \in [\lambda^{2/3}, \lambda^{1/3}]$.

In such a scenario, a sufficient decline in ρ pushes π_{EC_1} below π_{EA} and leads to pure elite oligarchy. Moreover, the lower β is (while within $[\lambda^{2/3}, \lambda^{1/3}]$), the smaller the gap between π_{EC_1} and π_{EA}; hence, the larger the tendency for π_{EC_1} to fall below π_{EA} given a drop in ρ. This completes the proof. ■