Diversity and Redistribution*

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Abstract

In this paper we analyze the interaction of income and preference heterogeneity in a political economy framework. We ask whether the presence of preference heterogeneity (arising, for example, from different ethnic groups or geographic locations) affects the ability of the poor to extract resources from the rich. We study the equilibrium of a game in which coalitions of individuals form parties, parties propose platforms, and all individuals vote, with the winning policy chosen by plurality. Political parties are restricted to offering platforms that are credible (in that they belong to the Pareto set of their members). The platforms specify the values of two policy tools: a general redistributive tax which is lump-sum rebated (or used to fund a general public good) and a series of taxes whose revenue is used to fund specific (targeted) goods tailored to particular preferences or localities.

Our analysis demonstrates that taste conflict first dilutes but later reinforces class interests. When the degree of taste diversity is low, the equilibrium policy is characterized by some amount of general income redistribution and some targeted transfers. As taste diversity increases in society, the set of equilibrium policies becomes more and more tilted towards special interest groups and against general redistribution. As diversity increases further, however, the only policy that can emerge supports exclusively general redistribution.

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1 Introduction

Societies are heterogeneous both in preferences and in incomes. The consequences of this are manifested in outcomes as diverse as residential and schooling choices to political affiliations, armed conflicts, and breakdowns of society or civil war. From Marxist theories of class struggle to Tiebout models of individual sorting, thinking about heterogeneity among individuals plays a key role in our attempts to understand society.

This paper seeks to understand how diversity in preferences affects the basic conflict between rich and poor, particularly regarding their opposing views on redistribution. More generally, this paper asks how do class and preference conflicts interact? If individuals, particularly those with low income, do not agree on how resources (tax revenue) should be allocated, how does this affect the ability of the poor to press for redistribution? On the one hand, one may think that conflicting preferences over resource allocation may create cleavages among poorer individuals and thus work against their general class interest. On the other hand, the presence of many narrow "special-interest groups" may create an incentive for wealthier individuals to ally themselves with the general interest of the poor if this implies a lower overall tax burden. Or, does conflict over the preferred way to allocate resources simply lead to even greater overall redistribution since there are more varied interests to satisfy?

This paper aims to (partially) answer the questions raised above by analyzing how income and preference diversity interact in an environment in which political parties and party platforms are endogenous. The government is assumed to be able to both redistribute income and to fund special-interest projects (e.g., local or group-specific public goods), all from proportional income taxation. Individuals differ in income (they can be either "poor" or "rich") and also as to which special interest project (if any) they benefit from. Heterogeneity in the ability to enjoy a particular project can be thought of as arising directly from differences in preferences (perhaps as a result of different ethnic or religious affiliations) or from differences in geographic locations (if, for example, tax revenue is used to fund local public goods). It can also be thought of as arising from the differential ability of agents to organize themselves in (special interest) groups that then participate in the political arena.

We study the equilibrium of a game in which representatives of different groups form parties, parties propose platforms, and all individuals vote, with the winning policy chosen by plurality. Political parties are restricted to offering platforms that are credible (in that they belong to the Pareto set of their members and hence will not be renegotiated ex post). The platforms specify the values of two policy tools: a general redistributive tax which is lump-sum rebated (or used to fund the general public good) and a series of taxes used to fund the specific (targeted) goods tailored to particular groups, preferences, or localities.

We show that there is an equilibrium in which a party representing the poor wins with a policy of maximum general redistributive taxation. In addition, there also can exist an equilibrium with a heterogeneous political coalition consisting of the rich and a number of interest groups. This coalition engages in a policy of redistribution targeted towards the special interest groups within the coalition and in a lower level of overall redistribution. As the heterogeneous coalition of the rich and the interest groups has an incentive to form to overturn the policy of maximum general redistribution, we focus on its equilibrium platform.

We examine how the policies of the heterogeneous coalition are affected by the degree of diversity in society–i.e., by changes in the probability that any two individuals belong to the same interest group. The degree of diversity matters in this economy since we focus on goods produced with increasing returns to scale. Thus, in the case of geographic diversity, providing a given level of schooling or health care to individuals is more costly if they live in different localities (and hence more schools or hospitals need to be constructed). Or, in the case of preference diversity, providing individuals with a given level of utility from public goods is more costly if they have different tastes over public goods as it requires a greater variety of public goods to be produced (e.g., a park and a school).[1]

Our analysis demonstrates that the effect of increased diversity is non-monotonic. Starting from a low level of diversity, we find that increased diversity first serves to dilute class interests, lowering the amount of redistribution from the rich to the poor, but that after some critical level, further increases in diversity reinforces class interests. When the

[1]For simplicity, we model preference diversity as each group of individuals obtaining utility only from the good it prefers (e.g., only from schools or only from parks) and not from others. This assumption can be relaxed without affecting our results.

degree of diversity is low, the equilibrium coalition policy is characterized by some degree of general income distribution and some targeted transfers. As a group, however, the poor obtain less income redistribution than if preferences were homogeneous and the rich pay a lower level of total taxes. As diversity increases in society, the set of equilibrium policies this coalition can offer becomes more and more tilted towards the special interest groups and against general redistribution; the poor are made worse off. As diversity increases further, however, this situation is not sustainable. We show that there exists a critical threshold of diversity above which the ruling coalition breaks down and the only policy that can emerge supports exclusively general redistribution. In fact, this policy is identical to the one that would be instituted in the absence of any preference diversity at all. Thus, while at first increased diversity destroys solidarity among different groups of poor individuals, at a sufficiently high level of diversity, conflict in preferences is ignored and the traditional class conflict regains its primacy.

Our paper is organized as follows. In section 2 we discuss the related theoretical literature. In section 3 we present the model which includes a description of the economic environment and the political process. Section 4 analyzes the political equilibrium and in section 5 we examine in depth the effect of diversity on the unique coalition that emerges under these circumstances. We discuss the role of our main assumptions in section 6 and conclude in section 7.

2 Related Literature

Our paper is related to a recent theoretical literature on redistribution and the provision of public goods. Alesina, Baqir, and Easterly (1999) analyze the effect of increased taste diversity on public good provision in a median voter model in which individuals can fund only one of many possible public goods. Individuals differ in their valuation over these goods. As taste diversity increases, the benefit for the average voter from the public good chosen by the median voter decreases, leading to lower overall funding for this good. In our model, on the other hand, the number of excludable public goods that are funded is endogenous and general redistribution is feasible as well. To consider these issues in a median voter model would be impossible without allowing for a multiple-stages voting process, and we therefore employ an endogenous parties framework.

Lizzeri and Persico (2002) consider election campaigns which can promise voters both targeted transfers and the provision of a universal public good. They analyze the effect of increasing the number of parties which compete for political power and show that the greater the number of parties, the larger are the inefficiencies in the provision of the public good.[2] The reason for this is that, in equilibrium, parties divide the number of voters equally among themselves and face an equal probability of winning the election. Thus, when the number of parties increases, each party can win by catering to a smaller share of the voters and finds it effective to do so using targeted goods rather than by a general universal good which benefits other constituencies as well. This paper differs from ours in some important ways. First, the number of parties that exist is exogenous. Second, voters are homogeneous in income. Thus, while it is possible to think of each individual in their model as constituting its own special interest group (so preferences are, de facto, diverse), it is not possible to study how an increase in diversity affects either redistribution from rich to poor nor the provision of the universal public good.

Roemer (1998) examines how the existence of a second issue other than general redistribution affects policy outcomes in a model with political parties. He shows that the existence of another salient issue (e.g. religion) can work against the pure economic interests of the poor if this non-economic issue is sufficiently important (see also Besley and Coate (2000)). Thus, whereas in Roemer's model non-economic issues divide the poor, in our model the political conflict is over the use of tax revenues. Furthermore, while parties play an important role in both models, in our model the constituency and number of parties is endogenous and individuals derive utility only from policies and not from winning seats.

Levy (2005) uses a similar political economy framework as ours to study how the conflict between using tax revenues to fund public education versus income distribution may divide the poor. She focusses on goods produced with constant returns to scale and considers only two interest groups: young individuals (who value education) and old individuals (who do not value education). Other than these two different preferences determined by age, there is no additional preference diversity in the economy. The main result is a negative cohort size effect, i.e., when the young are a minority, then the poor

[2] See also Weingast, Shepsle, and Johnson (1981) for a model of legislative bargaining over public good provision which results in inefficient provision.

segment of the young forms a coalition with the rich and this coalition provides public education, whereas if the old are a minority, then the poor segment of the old are the ones to form a coalition with the rich, and this coalition provides income redistribution instead.

Finally, Austen-Smith and Wallerstein (2006) examine how general redistribution is affected by the existence of race in a model of legislative bargaining with an exogenous number of legislators. Legislators can choose a level of affirmative action to support (where the latter guarantees a proportion of jobs with economic rents to a particular racial group). Assuming that a legislator represents either high human-capital Whites, low human-capital Whites or Blacks (in which case he maximizes a weighed average of high and low human-capital Blacks), they find that the existence of race hurts those who have no positive economic interest in affirmative action and who would instead benefit from redistribution, i.e., low human-capital Whites. In this sense, race works against the common interest of poorer individuals. Our model differs from Austen-Smith and Wallerstein in that the political outcome in our model is a result of an electoral process and not a legislative one. Consequently, the composition and hence the interests of political parties are endogenously determined. Our model is also a simpler one in which to ask how diversity affects policies.

3 The Model

3.1 The Environment

The polity consists a mass of agents with total measure one who belong to one of two income types, poor with income $\underline{y}$ or rich with income $\overline{y} > \underline{y}$. The poor, on the other hand, are partitioned into $K + 1$ sub-types, to be thought of as K groups (e.g. either K ethnic groups or K organized interest groups), each of whom desires a type-specific public good, k, in addition to private consumption, and one other type that, like the rich, only obtains utility from private consumption. We will often refer to the sub-groups that derive utility from targeted consumption as "special interest groups".[3]

Thus, in addition to the private consumption good, x, there is a set of type-specific public goods, indexed by k, which we sometimes call "targeted goods" in that they are

[3] Extending the model to consider rich interest groups is discussed in Section 6.

assumed to be targeted for consumption for group k, $k \in \{1, 2, ..., K\}$ or only enjoyed by group k. This property of the targeted goods can be thought of as arising from either geographic or preference differences across groups For example, they can be locally provided goods (e.g., education, parks, hospitals) or goods that will be used more by a particular group (e.g., a school by households with children or an ice-skating rink for those who skate).

We can represent the utility function for a member of an interest group k as:

$$U(x, q_k) = x + V(q_k), \tag{1}$$

where q_k is the quantity of good k and V is an increasing, concave, twice-differentiable function satisfying $V'(0) = \infty$. For everyone else, preferences are given by:

$$U(x) = x. \tag{2}$$

Denote the share of the rich in the population by λ. We assume that the poor are a majority, i.e., $\lambda < 0.5$, and that less than half the population belongs to some interest group. This last assumption is not important and we discuss the case in which the share of these groups exceeds 0.5 in Section 6.

Before describing the particular process that gives rise to political parties, we first turn to the policy space. We restrict policies to proportional income taxes. Taxation can fund either general lump-sum redistribution, or a set of the type-specific public goods, or both. A policy therefore is a vector of tax rates where τ is the tax rate dedicated to general (lump sum) redistribution and t_k funds the kth targeted public good.

Taxation is assumed to be distortionary in the sense that it wastes resources of $G(\tau+T)$ per capita, where $T = \sum t_k$. The function $G(.)$ is assumed to be an increasing, convex function with $G(0) = 0$, $G'(0) = 0$, and $G'(1) = \infty$.[4] This cost can represent the resources expended in collection and the enforcement of taxation. In a more elaborate model, it would be the cost associated with the loss of output incurred when endogenous labor supply is distorted by taxation. We assume this cost is borne equally by all agents.

Producing (or redistributing) the targeted good is assumed to entail a fixed cost of c_k and a constant marginal cost (normalized to one).[5] Thus, given a general tax τ and

[4] The assumption of distortionary taxation is solely to ensure an interior solution to preferred tax rates and plays no role otherwise.

[5] Alternatively, the fixed cost can be thought of as a distribution cost.

mean income $\mu \equiv \lambda\overline{y} + (1-\lambda)\underline{y}$, the total amount of the lump-sum rebate is $\tau\mu$ and the consumption of targeted good k (by group k) is given by:

$$q_k = \begin{cases} \frac{t_k\mu - c_k}{n_k} & \text{if } t_k\mu > c_k \\ 0 & \text{if } t_k\mu \leq c_k \end{cases} \tag{3}$$

where n_k is the number of individuals in interest group k .[6] For simplicity we assume $c_k = c$ for all k . As will be made clear in sections 4 and 5, the fixed cost of producing a targeted good plays no role in characterizing equilibria in the model, but it plays a important role in our analysis of the comparative statics of diversity. The assumption of no fixed cost associated with general redistribution, on the other hand, is inessential.

It is useful at this point to write each type's indirect utility function. For individuals who do not belong to an interest group,

$$W(\tau, T) = y(1-\tau-T) + \tau\mu - G(\tau+T) \tag{4}$$

for $y \in \{\underline{y}, \overline{y}\}$, whereas for individuals who belong to interest group k :

$$W_k(\tau, T, t_k) = \underline{y}(1-\tau-T) + \tau\mu - G(\tau+T) + V\left(\frac{t_k\mu - c}{n_k}\right) \tag{5}$$

whenever $q_k > 0$ and otherwise it is as in (4).

3.2 The Political Process

The tax rates, general and specific, are determined via a political process whose equilibrium prediction is a set of parties, the taxes they offer, and the winning tax policy.

We assume that each type in the population (the poor, the rich, and each special interest group) is represented in the political process by one representative, a politician, whereas the remaining individuals of each type participate in the election as voters.[7] Thus, an alternative interpretation of interest groups is that these are the different localities, or preference types, that have organized themselves and are consequently represented in the political process. The rest of the poor, according to this interpretation, have not organized themselves by their particular preferences over public goods; consequently, they participate in the political process as an undifferentiated mass organized solely on the basis of their general redistributive interest.

[6] The same results obtain if we assume that the specific good is a pure public good rather than a publicly provided private good as assumed above.

[7] This assumption can approximate the idea that political representation or running for election is costly.

The $K + 2$ representative politicians can either run on their own or form coalitions with other politicians. Henceforth, we refer to a *coalition* as a party which consists of more than one member. For simplicity, there are no costs of running for election or benefits from holding office. Each representative cares therefore only about the political outcome, i.e., the tax rates chosen by the political process.

We follow the basic citizen-candidate model (see Besley and Coate (1997) and Osborne and Slivinski (1996)) by assuming that parties that consist solely of a single representative can only commit to the representative's preferred policy. Although this is an extreme assumption (as is the opposite one of perfect commitment to any policy), it is an interesting one to explore and, more importantly, it ensures the existence of equilibrium in a multidimensional policy space. Extending this assumption to coalitions, as in Levy (2004), we assume that a party that consists of agents from different groups can commit to any policy (platform) on the Pareto frontier of the members of the party.

We assume that, given a partition of the representative politicians into parties, parties simultaneously choose whether to offer a platform and what platform to offer. Given the set of policies offered by parties, the following rules determine the political outcome:

(1) Individuals vote sincerely, independently of the party membership of their representative.

(2) When indifferent among preferred offered platforms, an agent mixes among them with equal probabilities.

(3) The winning platform is chosen by plurality rule; if platforms tie, then each is chosen with equal probability.[8]

(4) If no platform is offered, a default status quo policy is implemented.[9] Agents are assumed to prefer their own ideal point to the default policy.

The payoff of a representative politician from the set of policies offered by all parties is therefore his expected utility from the political outcome given (1)-(4), i.e., given the expected outcome from the vote shares that will be allocated to each policy in this set.

We require that in equilibrium, parties offer policies which, given the resulting political outcome, are best responses to one another. In addition, we impose a stability

[8] Generically, platforms will not tie and hence one platform will win.

[9] The exact nature of the default policy plays no role in the analysis.

requirement.[10] In order to discuss stability, we will say that *a subcoalition within a party "induces a new partition"* when it splits from its original coalition (and the other parties remain as in the original partition). The formal definition of equilibrium follows below.

Consider a given partition of the $K+2$ representatives into parties (including one-member parties). A *candidate for equilibrium*, χ, is a set of policies offered by the parties in the partition such that each policy is on the Pareto set of the party offering it and such that the set of policies satisfies condition (E1):

(E1) For each party, there does not exist an alternative policy that is on its Pareto frontier (including not offering a platform) such that, taking the other platforms as given, it increases the payoffs of all of its members, for at least one of them strictly.

In order to be an equilibrium, the equilibrium candidate in a given partition χ must in addition satisfy (E2) and (E3):

(E2) There does not exist a subcoalition within a party that, by splitting, induces a new partition in which there exists a candidate for equilibrium χ' which makes all of the members of the subcoalition weakly better off.

(E3) For each party if, taking the other platforms as given, the set of winning platforms is exactly the same when it offers its platform as when it doesn't, it chooses not to offer a platform.

Condition (E1) is a "party best response" condition which asserts that for a given partition, and taking other platforms as given, each party member has a veto power concerning deviations.[11] Similarly, single-member parties who offer a platform or not should find their action optimal, taking other platforms as given.[12]

Parties are endogenous in the model in the sense that partitions are stable only if there is no subcoalition within a party that can profitably split from its party, as specified in condition (E2). While this condition allows a subcoalition to split from its party, it does not allow it to form a new party with other coalitions or representatives. The reason for this restriction is that, in a multidimensional policy space, a stability concept

[10] See Levy (2004) for a related model.

[11] See also Roemer (1999).

[12] It is easy to show using Lemma 3 and Proposition 1 which are introduced further on, that a pure strategy candidate for equilibrium exists for all partitions.

which allows for all types of deviations will typically result in no stable outcome.[13] Note that condition (E2) allows the remaining parties (including the remainder of the original party) to modify their platforms in response to a party split. That is, the deviators take into consideration that, following a split, the platforms in the new partition must satisfy condition (E1), including the platform of the party from which it split.

Condition (E2) is also "optimistic" in the sense that a subcoalition prefers to deviate if there exists an equilibrium candidate in the new partition which at least weakly improves its utility even though there may exist another equilibrium candidate in the new partition which would decrease its members' utility. This allows us to reduce the number of equilibria and simplifies the analysis as seen in Proposition 1.

Finally, condition (E3) is a tie-breaking rule which restricts attention to equilibria in which whenever all party members are indifferent between offering a platform and not doing so, they prefer the latter. This can be thought of as the less "costly" action (we do not explicitly assume that there are costs of offering a platform, but introducing some small costs does not alter our results). This condition further simplifies the analysis by reducing the number of equilibria.

4 The Political Equilibrium

As we show below, there are two possible (pure strategy) equilibria in the model. In one of them, the common interest of the poor (including the interest groups) is served. That is, the poor as a group impose their preferred degree of general redistribution. In the second equilibrium, the poor as a group are divided. Some interest groups join forces with the rich and by doing so reduce both general redistribution and the overall tax burden. This policy goes against the general interest of the poor and is preferred by the rich to the first equilibrium. It is nonetheless beneficial for the interest groups that participate in the coalition since it allows these to achieve a sufficiently high level of targeted goods.

[13] See also Ray and Vohra's (1997) theory of coalitions.

4.1 Ideal Policies and Induced Preferences

In order to solve for the equilibria of the model, it is useful to start by describing the ideal points of each individual type. Let R denote the rich. These individuals' preferred outcome is $(\tau, t_1, t_2, ..., t_K) = (0, 0, 0, ...0)$.

The group of poor individuals who do not belong to any interest group is denoted by P_0. The preferred policy of this group is $(\tau^*, 0, 0, ...0)$ where τ^* solves:

$$\mu - \underline{y} - G'(\tau^*) = 0 \tag{6}$$

We will often refer to this outcome as "maximum redistribution", or in short, MR.

Lastly, a poor individual who belongs to interest group k , P_k, has an ideal policy $\left(\widetilde{\tau}, 0, 0, \widetilde{t}_k, ...0\right)$, given by:

$$\mu - \underline{y} - G'(\tilde{\tau} + \tilde{t}_k) \leq 0 \tag{7}$$

$$-\underline{y} - G'(\tilde{\tau} + \tilde{t}_k) + \frac{\mu}{n_k} V'(q_k(\tilde{t}_k)) \leq 0. \tag{8}$$

and the corresponding Kuhn-Tucker conditions. At an interior solution in which both taxes are positive, (7) and (8) are satisfied with equality. By (6), $\widetilde{\tau} + \widetilde{t}_k = \tau^*$. At one corner solution, in which (7) is still satisfied with equality but the left-hand-side of (8) is negative, then $\tilde{t}_k = 0$ and $\tilde{\tau} = \tau^*$. At another corner solution, (7) is not satisfied implying that $\tilde{\tau} = 0$ and that $\tilde{t}_k > \tau^*$.

We can now put more structure on the policies in the Pareto set of the different coalitions as well as on agents' preferences over these policies.

LEMMA 1 *A coalition composed solely of poor agents (independently of whether any of them belong to an interest group) can only propose policies with total taxation of at least* τ^*. *The targeted transfers to excluded interest groups is set to zero.*

Proof: Denote such a coalition of P_k's and possibly P_0 by C and its policy by $(\hat{\tau}, \hat{t}_1, \hat{t}_2..., \hat{t}_K)$ with $\hat{T} = \sum_{k \in C} \hat{t}_k$. Obviously, $\hat{t}_k > 0$ for $k \notin C$ is not on its Pareto set. Note also that, given a vector of t_k's, all members of the coalition share the same preferences over τ. Hence $\hat{\tau}$ must satisfy:

$$\begin{aligned} \mu - \underline{y} - G'(\hat{\tau} + \hat{T}) &= 0 \text{ if } \hat{\tau} > 0 \\ \mu - \underline{y} - G'(\hat{T}) &< 0 \text{ otherwise.} \end{aligned} \tag{9}$$

which, by (6), implies that total taxation $(\hat{\tau} + \hat{T})$ is at least τ^*.||

LEMMA 2 *All voters not represented in some coalition C prefer maximum redistribution (MR) to C's policy.*

Proof: By Lemma 1, the statement above holds for R and for any $P_k \nsubseteq C$. The Lemma trivially holds for P_0.||

Note that MR is an equilibrium of the model. To see this, consider a partition with no coalitions and suppose that only P_0 offers a platform–its ideal policy of MR. This policy wins as it is preferred by all the poor (independently of whether they belong to an interest group) to the ideal policy of R. Furthermore, it is preferred to the ideal policy of any P_k by all other poor agents and by the rich. In both cases, the groups favoring MR over the alternative consist of over half the population and thus P_0's ideal policy wins. Using the above results, we next show that MR is an *equilibrium candidate* in other partitions.

LEMMA 3 *MR is an equilibrium candidate of every partition in which there is no coalition representing a majority of the population (hereafter denoted a* ***majoritarian coalition****). It is also an equilibrium candidate when a majoritarian coalition exists if, for at least one equilibrium candidate χ', the majoritarian coalition loses.*

Proof: Consider a partition as described in the Lemma and a policy of MR. By Lemma 2, no non-majoritarian party can win against this policy. Consider now a majoritarian party. Any platform which was supported by a sufficiently large proportion of its members so that it won against a policy of MR must also be preferred by these members to the winning policy in χ'. As χ' is an equilibrium candidate in which the majoritarian party loses, no such platform can exist and MR is an equilibrium candidate.||

The next two lemmas will prove useful in the full characterization–in Proposition 1–of the equilibria of the model.

LEMMA 4 *Given a partition, all agents have the same preference ordering over platforms offered by parties to which they do not belong.*

Proof: See the appendix.||

COROLLARY 1 *In equilibrium, all agents who do not vote for their own party's platform vote for the same party.*

Proof: Follows directly from Lemma 4.||

LEMMA 5 *In equilibrium, if an agent votes for the platform x of a party X to which* *she does not belong, then all agents who belong to X vote for x as well.*

Proof: See the appendix.||

Prior to presenting our first major result, note that one uninteresting case to consider is when at least half the population belongs to P_0 as the only equilibrium is then MR. We henceforth assume that P_0 consists of less than half the population.

4.2 The Equilibrium: General versus Targeted Redistribution

We now characterize the equilibria of the model, focusing on pure strategy equilibria. It is useful at this point to introduce additional terminology. We say that a coalition *represents m groups* if the number of different representative politicians in the coalition is m. We further define a coalition representing m groups as a *"minimal winning coalition" W* if the proportion of the population belonging to these m groups is no smaller than .5 and the proportion belonging to any $m-1$ groups is less than .5.

PROPOSITION 1 *In all pure strategy equilibria either P_0 wins with MR, or a minimal winning coalition W composed of R and a number of P_k groups wins. W's policy consists of positive targeted transfers and total taxation lower than τ^*. The policy satisfies conditions r and p_k below.*

The key intuition for the proof (provided below) is that it is not credible for P_0 to be a member of W, as it would rather deviate and win by itself. On the other hand, a W consisting of R and the poor interest groups can win against P_0 if they provide each coalition member with a utility greater than what she obtains from the ideal policy of P_0 (so as both to win against P_0 and to ensure that no coalition member will split from the coalition to allow P_0 to win). This implies that total taxation has to be less than τ^* (to satisfy R) and that, in return, targeted taxation to interest groups in the coalition has to positive.

Proof: We have already shown that P_0 winning is an equilibrium. It is left to show that the only other possibility is a W composed of P_k's and R and to characterize its policies.

Claim 1: If in some partition P_0 is not winning (alone or in a coalition), then there exists a minimal winning coalition W (thus consisting of R and some P_k's). Only W offers a platform, which is preferred by its members to MR, and no other coalition exists.

Proof of Claim 1: Consider an equilibrium in which P_0 neither wins on its own nor belongs to a winning coalition. Denote the equilibrium winning party by W and its winning policy by w. Denote the party of P_0 (possibly consisting only of P_0) by S.

First, we will show that no coalitions other than W or S will offer a platform in equilibrium. Suppose that an additional coalition, say V, offers a platform. By Lemma 5, there are two cases to consider:

1. V obtains votes from only its own members or also from some voters represented by party Q which does not offer a platform.

2. V obtains votes from members represented by some party Q which also offers a platform (as well as from its own members).

Consider case 1. We will show that it must be profitable for V to deviate and not offer a platform. By Lemma 4, following such a deviation, all V votes must go to one and the same party. If following the transfer of votes w still wins, then the equilibrium did not satisfy condition (E3). If, alternatively, another party Z wins, then it must be that all the votes of V transferred to Z, which implies that all voters of V prefer z to w. This is a violation of (E1).

Consider case 2. We will show it is profitable for Q to deviate and not offer a platform. Since some members of Q voted for V then, by Lemma 4, all other agents who do not belong to Q must also prefer $V's$ platform over Q's platform and furthermore, all members of Q prefer $V's$ platform over w. Thus, if Q no longer were to offer a platform, its votes would transfer to V, which, as in case 1, is (weakly) profitable for Q.

We can conclude that no party V can offer a platform in equilibrium.

Second, we show that W must represent at least 50% of the population, and that its members must prefer w to MR. To see why, note that otherwise S can offer MR (as it is on its Pareto set), and win. By Lemma 2, all members of S prefer MR to w, as well as agents excluded from W. But this is a violation of (E1). Thus, a mass of agents constituting at least 50% of the entire population must prefer w to MR. These agents must belong to W as this preference ordering is not possible for any individual outside the party. Thus, the winning coalition W must consist of both R and P_k's.

Third, note that as S cannot win against W, by (E3), it will not offer a platform. Nor can any other coalition exist since given that members of W prefer w to MR, they also prefer it to any other policy feasible for any other existing coalition. Thus, w is an equilibrium candidate of any partition induced by a split of a coalition in the original partition (other than W). By condition (E2), all coalitions other than W will split.||

Claim 2: W must be a minimal winning coalition.

Proof: The winning coalition can only offer policies $(\hat{\tau}, \hat{t}_1, ..., \hat{t}_K)$ that both belong to its Pareto set and that a majority of its members prefer to MR. The last requirement implies that the policy must satisfy the conditions below:

$$\bar{y}(1 - \hat{\tau} - \sum \hat{t}_k) + \hat{\tau}\mu - G(\hat{\tau} + \sum \hat{t}_k) \geq \bar{y}(1 - \tau^*) + \tau^*\mu - G(\tau^*) \qquad (r)$$

$$\underline{y}(1 - \hat{\tau} - \sum \hat{t}_k) + \hat{\tau}\mu - G(\hat{\tau} + \sum \hat{t}_k) + V(\frac{\hat{t}_k\mu - c}{n_k}) \geq \underline{y}(1 - \tau^*) + \tau^*\mu - G(\tau^*) \quad (p_k)$$

The first condition, r, describes the set of policies that an R agent prefers to MR. The second set of conditions, p_k, describes the set of policies that an agent belonging to P_k prefers to MR. If there are k different interest groups in the coalition, then this condition must hold for at least k' of them so that the members of the k' groups plus the rich constitute a minimal winning coalition.

Suppose that W is larger than minimal winning. In that case, a subcoalition consisting of R and all the P_k groups for which p_k holds can defect (if this condition holds for all P_k groups, then all of them other than the smallest one can defect) and offer a policy in the new Pareto set that (weakly) dominates the original one for all members of the subcoalition and sets the targeted transfer for the excluded interest group(s) to zero. This new policy will still win, a contradiction to (E2). ||

Claim 3: The equilibrium policy satisfies r and p_k for all k in W, with $t_k > 0$ for each k in the coalition, and lower total taxation than τ^*.

Proof: If W splits, by Claims 1 and 2, P_0 would win. Thus by (E2), the policy must satisfy r and p_k for all k in the coalition. These imply $t_k > 0$ and $T + \tau < \tau^*$.||

Claim 4: Coalitions with P_0 cannot win in equilibrium.

Proof: Consider first a winning platform offered by either a coalition of P_0 with either R or with some P_k's. By Lemma 3, if P_0 breaks from the winning coalition, MR is an equilibrium candidate. Thus, by (E2), the original policy was not an equilibrium. Consider then a winning coalition composed of P_0, R, and some P_k's. But then either P_0 or a coalition of R and some P_k's will have an incentive to split: If the union of R and the P_k's in the coalition represents a majority of the population and there exists a policy w' that satisfies r and p_k for them, then a minimal coalition will split and win. Otherwise, P_0 will split and win with MR. Thus, in both cases (E2) was being violated.

This completes the proof of Proposition 1.||

We conclude that in any pure strategy equilibrium the outcome is either MR (when P_0 wins) or (when W wins) a policy consisting of a bundle of strictly positive specific tax rates and a general redistribution tax, where the latter is set at a lower level than under MR as is overall taxation. Note that whenever such a coalition is possible (i.e., whenever a policy exists on the Pareto frontier of its members that satisfies r and p_k), there will be an incentive for it to form as its members are made better off relative to an MR equilibrium. The next section of the paper is therefore devoted to analyzing the conditions for such a coalition to be feasible. We focus particularly on the effect of diversity in society on the ability of the coalition to form and win.

5 Diversity and Redistribution

Our model yields predictions regarding the effect of diversity on equilibrium policies. We show below that greater diversity is associated with coalition policies that yield less general redistribution and more targeted redistribution towards interest groups. In this sense, greater diversity harms the general interests of the poor. We will also show, however, that there exists a critical level of diversity beyond which the coalition breaks down and the unique equilibrium is maximum redistribution. Thus our model predicts a non-monotonic relationship between diversity and general redistribution.

For simplicity, we restrict our analysis to the symmetric case in which interest groups have the same size, $n_k = n$, and interest groups in the coalition (hereafter denoted W) are treated equally, i.e., $t_k = t$ for $k \in W$. We denote the number of special interest groups in W by N and therefore $T = Nt$. As all $P_k \subset W$ have the same induced preferences over these policy bundles, we will use P to denote the generic interest group within the coalition. Henceforth, we treat the interest groups in the coalition as a unitary player that chooses among (T, τ) schemes satisfying the constraint that $T = Nt$.[14]

In what follows, we will think of an increase in diversity as an increase in the number of interest groups (and hence different tastes) represented by a given share of

[14] The assumption of symmetric treatment does not affect the qualitative results.

the population. Hence, an increase in diversity results in an increase in K -the number of distinct interest groups in the population- and consequently a decrease in n – the number of individuals that belong to any interest group. Note that, in keeping with measures of ethnic fractionalization, an increase in diversity implies a decrease in the probability that any two individuals belong to the same interest group.

We further simplify our comparative statics analysis by treating N as a continuous variable. This avoids the problem that arises when an increase in diversity changes the size of the winning coalition in a discontinuous fashion. To see why this would occur, note that in a discrete model the coalition would generically include more than 50% of the population. Hence, as the number of interest groups increased it would be possible to decrease, in a discontinuous fashion, the measure of individuals represented by the winning coalition until the latter represented exactly half the population. This situation is avoided by treating N as a continuous variable. Thus, letting ϕ denote the total number of agents belonging to the interest groups within the coalition, we have $n = \frac{\phi}{N}$. An increase in diversity consequently does not change ϕ, but rather changes n so as to keep ϕ constant, i.e., $dn = -\frac{\phi}{N^2}dN$.[15]

We can now rewrite q as total revenue $T\mu$ minus the total redistribution costs cN, divided by the total number of individuals in W belonging to an interest group. Thus,

$$q = \frac{T\mu - cN}{\phi} \tag{10}$$

which is equivalent to the expression in (3).

5.1 A Useful Diagram

It is easiest to think about equilibrium policies using the following figures. In Figure 1 we describe typical indifference curves for individuals in W. The τ^* line gives the locus of (T, τ) that satisfy (9); the T^* curve gives the locus of (T, τ) that satisfy the first order condition w.r.t. T (a condition analogous to 8):

$$-\underline{y} - G'(\tau + T) + \frac{\mu}{\phi}V'(\frac{T\mu - cN}{\phi}) = 0. \tag{11}$$

[15] One can construct a continuous version of the model; the nature of the analysis below will not change much otherwise and to keep matters simple, we analyze the equilibrium that exists in the discrete version of the model. That is, we are not interested in the equilibria of a continuous model but rather use this assumption to simplify the presentation of our results.

For expositional ease, our discussion assumes that $P's$ ideal policy is an interior solution, i.e., has $\tau > 0, T > 0$.[16] Thus, P's ideal policy lies at the intersection of T^* and τ^*. For future use, we define q^* as the level of q that satisfies both first-order conditions. The ideal policy of R is at $(0, 0)$. The $q = 0$ line shows the level of T such that $T\mu - cN = 0$.

We will focus on regions of the policy space that are relevant for our analysis, i.e., on policies that are preferred by both R and P to the MR policy. Note that these policies must lie strictly to the right of $q = 0$ since, if restricted to $q = 0$, P prefers MR.

We show a typical indifference curve of a poor individual who belongs to W. It is labelled W_P. The egg shape of the indifference curve can be derived by noting that at points of intersection with τ^* the slope must be infinite (see 9), whereas at points of intersection with T^* the slope is zero (see 11). Lastly, it is easy to show that the indifference curves of rich individuals are convex (one such curve is W_R in the figure).

The W coalition can offer voters policies in its Pareto set. The Pareto set is characterized in Figure 2 (the bold curves). It is composed of two distinct sets. The first one is a set of policies characterized by $T = 0$ and an interval of τ from $\tau = 0$ to an upper limit that is no greater than τ^*. Since these policies lie to the left of the $q = 0$ line, any small increase in T makes both R and P worse off. Being to the left of the $q = 0$ line, however, implies that this portion of the Pareto set is not relevant for our analysis. The second part of the Pareto set is 'interior'; it is composed of policies at the tangencies of the indifference curves of R and P. Only this portion is relevant to our analysis. Moreover, this portion of the Pareto set is always to the left of both the τ^* and the T^* line. Otherwise, both groups can be made better off when taxes are reduced (see the Appendix for a complete proof).

We can now describe the feasible policies that W can implement in equilibrium (Figure 3). These are policies on their Pareto set which both prefer to $(0, \tau^*)$. To find these policies, consider the indifference curve which gives P the same utility as MR. This indifference curve, which we denote as the p curve, is the locus of (T, τ) satisfying:

$$\underline{y}(1 - T - \tau) + \tau\mu - G(T + \tau) + V(\frac{T\mu - cN}{\phi}) = \underline{y}(1 - \tau^*) + \tau^*\mu - G(\tau^*). \quad \text{(p)}$$

Second, consider the indifference curve of R which provides the rich with the same

[16] The analysis and the results are similar when P's ideal policy is at a corner solution with $\tau = 0$ and $T > \tau^*$. If the ideal policy, however, is at the corner solution of MR, the coalition cannot be sustained.

utility as MR. The r curve is:

$$\bar{y}(1-T-\tau)+\tau\mu-G(T+\tau)=\bar{y}(1-\tau^{*})+\tau^{*}\mu-G(\tau^{*}). \quad \text{(r)}$$

The shaded area in Figure 3 shows the area bounded by these curves. The set of winning policies consists of the set described by the intersection of the Pareto set-the bold curve-with the shaded area. We will henceforth refer to this set of winning policies by Winning Interior Policies (WIP). Note that WIP is characterized by lower total taxes than under maximum redistribution, i.e., $\tau+T<\tau^{*}$.

5.2 The Effects of Greater Diversity

We now turn to our central analysis: the effect of greater diversity on feasible policy outcomes (i.e., on the WIP set). Increased diversity makes it more expensive to keep interest groups in the W coalition at any given level of utility since providing them with any given level of targeted goods requires higher targeted tax rates. How will the increase in diversity be accommodated by the coalition?

To understand how increased diversity affects the set of feasible policy outcomes, we start by examining how it affects the desired tradeoff between the two policy instruments for all members of the coalition. First, note that an increase in N affects neither the reservation utility nor the shape of R's indifference curves. Hence the r curve remains unchanged. The tradeoff for P, on the other hand, changes. At any given policy bundle (T,τ), all interest group members of the coalition obtain a lower level of q (since cN increases). This implies that the marginal benefit of a T increase ($V'(q)\frac{\mu}{\phi}$) is higher whereas the marginal benefit of a τ increase, μ, is unchanged. The marginal costs of the two policies are unchanged as well. Consequently, members of interest groups are now willing to bear a larger decrease in τ for a given increase in T, i.e., the indifference curves of P, and in particular the p curve, become steeper.

The steeper indifference curves of P and the unchanged ones of R imply that the new Pareto set lies below the old one. Indeed, it lies strictly below. That is, for any T belonging to the old Pareto set, the associated τ is strictly lower in the new Pareto set.[17] Hence, if the increase in diversity were accommodated by keeping R at the same level of utility as before, the new policy would be characterized by lower τ and higher T.

[17] Also the ideal policy has lower τ and higher T : to see this, note that when N increases, the T^{*} locus shifts to the right. The first-order condition implies that total taxation remains constant and hence, by

The effect on the egg-shaped p curve can be derived as follows: as N increases, the utility from MR remains unchanged, whereas P's utility from any other (T, τ) policy (with $q > 0$) decreases. Thus, for a given level of τ on the original p curve, the associated level of T must increase to keep P indifferent to MR. The increase in T, moreover, is greater than what is needed to compensate solely for the decrease in q (i.e. $\frac{dT}{dN} > c/\mu$) since, were it only to restore the original q level, P would be worse off due to the greater tax distortion. The WIP set lies in a region where P would prefer to increase both tax rates (to the left of both the τ^* and the T^* lines), hence increasing T further makes P better off. Thus, on the relevant part of the new p curve, each τ is associated with a higher level of q and higher T. In terms of Figure 4, increases in N "shrink" the egg-shaped p curve.

The set of policies in WIP consists of those policies in the Pareto set of the W coalition bounded by r and p. The WIP set is shown in bold in Figure 4. Since an increase in N shifts the Pareto set downwards and the p curve to the right, we can conclude that the set of policies that belong to the new WIP must lie below and to the right of the old WIP, as shown in the figure. This implies that the policies that can be implemented in equilibrium are characterized by higher T and lower τ. We summarize with the following proposition.

PROPOSITION 2 *An increase in diversity, N, implies that the policies in the WIP set have higher levels of T and lower levels of τ.*

Proof: See preceding discussion.||

Although without specifying the exact process that gives rise to the choice of a particular equilibrium policy we can only examine the effect of increased diversity on the WIP set, we can nonetheless state that a large enough increase in diversity will be unambiguously associated with lower general redistribution and higher targeted tax rates if the coalition does not break down, as is clear from Figure 4. Thus, as society becomes more diverse, the set of equilibrium policies tends to involve less general redistribution and more targeted taxation. As diversity increases, consequently, P_0 and excluded interest groups are in general made worse off.

One may wonder whether further and further increases in diversity necessarily lead

(8), q^* must also remain constant. This implies that the new ideal policy is characterized by a higher T and a lower τ.

to more spending on interest groups. The endogeneity of political parties is critical to thinking about this question since, as we show below, for a high enough level of diversity the coalition between the rich and the interest groups breaks down.

PROPOSITION 3 *There exists an* N^* *such that for* $N > N^*$*, the unique equilibrium is maximum redistribution.*

Proof: See the Appendix.||

As N increases, the r curve remains unchanged, but the p curve moves to the right and the Pareto set moves downwards and hence, as can be seen also in Figure 4, the WIP interval shrinks. For a high enough level of N, N^*, the WIP interval consists of solely one point-the tangency between r and p. For $N > N^*$, WIP is empty. At this point the W coalition breaks because there does not exist a policy that both R and P prefer to maximum redistribution. The unique equilibrium is then P_0 winning.

The proposition above establishes that the effect of greater diversity is non-monotonic. Increases in diversity tend to be associated with worse outcomes for all groups excluded from the reigning political coalition until a point is reached where this coalition collapses and maximum redistribution is the unique equilibrium outcome. This breakdown happens because a compromise between the coalition members is no longer feasible, as either the rich or the interest groups would prefer maximum redistribution to any policy the coalition can offer.

5.3 An Example

We now provide a simple example, with linear utilities and cost functions. The example not only illustrates our key results, but also the robustness of the analysis to alternative assumptions about the specifications of the utility and cost functions.

Specifically, let:

$$V(q) = \delta q$$

$$G(\tau + T) = \begin{cases} \alpha(\tau + T) & \tau + T \leq v \leq 1 \\ \beta(\tau + T) & \tau + T > v \end{cases}$$

In addition, let $\overline{y} = 2\underline{y}$, so that $\mu = (1 + \lambda)\underline{y}$.

Below are, for the case of $\tau + T \leq v$, the indirect utility of R, the indirect utility of P_0, and finally, that of an interest group P that belongs to the winning coalition with the rich, for $q = \frac{T\mu - cN}{\phi} > 0$:

$$\begin{aligned} W_R(T,\tau) &= 2\underline{y} - \tau(2\underline{y} + \alpha - \mu) - T(2\underline{y} + \alpha), \\ W_{P_0}(T,\tau) &= \underline{y} + \tau(\lambda\underline{y} - \alpha) - T(\underline{y} + \alpha), \\ W_P(T,\tau) &= \underline{y} + \tau(\lambda\underline{y} - \alpha) + T(\frac{\delta\mu}{\phi} - \underline{y} - \alpha) - \delta\frac{cN}{\phi}. \end{aligned}$$

As usual, the rich prefer no redistribution. Assuming that

$$\alpha < \lambda\underline{y} < \frac{\delta\mu}{\phi} - \underline{y} < \beta, \tag{12}$$

ensures that: (i) the ideal policy of P_0, MR, is $(T = 0, \tau^* = v)$; (ii) for cN sufficiently low, P's ideal policy is $(T = v, \tau = 0)$. Thus, P prefers targeted to general redistribution.

First note that MR is an equilibrium of the model. We will next show that there are policies which can be proposed by W - the coalition of the rich and P - that are also an equilibrium when diversity is low ($N \leq 1$) but that no such policies exist when diversity is high ($N \geq 2$), leading MR to be the unique equilibrium under those circumstances.

We start by assuming that the indifference curve of P is steeper than that of the rich, i.e.,

$$\frac{\frac{\delta\mu}{\phi} - \underline{y} - \alpha}{\lambda\underline{y} - \alpha} \geq \frac{2\underline{y} + \alpha}{2\underline{y} + \alpha - \mu} \Leftrightarrow \alpha > \frac{(1+\lambda)\underline{y}(\phi - (1-\lambda)\delta)}{(1+\lambda)\delta - \phi} \tag{13}$$

This implies that the relevant portion of the Pareto set of the coalition consists of policies of the form $(T, \tau = 0)$, for some $T \leq v$.

Next, such policy chosen by the coalition has to be better for both the rich and P relative to MR. For the rich this holds for any $T \leq T_R$ where

$$T \leq T_R = \frac{v(\alpha + (1-\lambda)\underline{y})}{\alpha + 2\underline{y}}.$$

The maximum tax rate that the rich will tolerate for targeted goods is therefore T_R. Similarly, interest groups will prefer any policy with $\tau = 0$ and $T \geq T_p$ to MR, where (for $T_P\mu - cN > 0$):

$$\begin{aligned} \delta(\frac{T_P\mu - cN}{\phi} - \underline{y} - \alpha) &= v(\lambda\underline{y} - \alpha) \Leftrightarrow \\ T_P(N) &\equiv \frac{v\phi(\lambda\underline{y} - \alpha)}{\delta(1+\lambda)\underline{y}} + \frac{cN + \phi(\alpha + \underline{y})}{(1+\lambda)\underline{y}} \end{aligned}$$

Any $T \in [T_P(N), T_R]$, $T_R \geq T_p(N)$, wins against MR. Thus, when $T_P(2) > T_R > T_p(1)$, i.e.:

$$\frac{v\phi(\lambda\underline{y} - \alpha)}{\delta(1+\lambda)\underline{y}} + \frac{2c + \phi(\alpha + \underline{y})}{(1+\lambda)\underline{y}} > \frac{v(\alpha + (1-\lambda)\underline{y})}{\alpha + 2\underline{y}} > \frac{v\phi(\lambda\underline{y} - \alpha)}{\delta(1+\lambda)\underline{y}} + \frac{c + \phi(\alpha + \underline{y})}{(1+\lambda)\underline{y}}. \tag{14}$$

then the coalition can be sustained when there is only one interest group, but collapses when there are two such groups. That is, when the interest group is split into two, the coalition cannot find a policy that all its members prefer to MR and MR is the unique equilibrium.[18]

6 Discussion

In this section we discuss the role of various assumptions. Several assumptions were made to simplify our analysis but are otherwise not essential to the results. First, we assumed that all interest groups members have low income. One could also allow some special interest groups to be rich. In that case, in addition to the W coalition, an alternative winning coalition could exist composed of the rich with both rich interest groups and poor interest groups. Our conclusions though would still be maintained.

Second, our analysis assumed that the majority of the population did not belong to an interest group (or, alternatively, was not represented by a politician). If the majority of the population is represented by interest groups, the same equilibria and comparative statics results still hold. There is an additional set of equilibrium policies that can exist in this case, however. Namely, a minimal winning coalition composed only of interest groups can command a majority of supporters and win the election. Even for this coalition, our conclusions remain the same. When diversity increases, its policies are characterized by greater targeted distribution and lower general distribution. At a critically high level of diversity, targeted goods become too expensive and maximum redistribution is itself the ideal policy of the coalition and thus the unique winning policy.

Third, we have assumed that within the poor there is a group which is interested only in general redistribution. Alternatively, in a more general model in which agents differ in the intensity of their preferences for targeted relative to general redistribution, this could be an interest group that gives relatively low weight to targeted goods and hence whose ideal policy consists of the smallest amount of targeted redistribution. In that case, the representative of this group would win the election when all parties are

[18] To see that the set of parameters that satisfies the economic environment of our model (e.g., $\lambda, \phi < .5$) as well as (12), (13) and (14) is not empty, consider $\lambda = 0.3$, $\phi = 0.3$, $\delta = 0.5$, $\alpha = 0.3$, $\underline{y} = 2$, $v = 1$, and $c = 0.1$. When $N = 1$, the coalitions wins with policies $T \in [0.373, 0.395]$. However, when $N = 2$, the coalition breaks down.

homogeneous.

Fourth, we have considered utility functions which are linear in income (or, more generally, linear in the utility from some common, non-targeted, good) and assumed concavity in the utility from the targeted good. This is not important for the analysis and all our results go through if, alternatively, we allow utility to be concave in income or linear in the targeted good. Thus, our analysis is applicable, as well, to the government providing a common good such as health or education, rather than income redistribution.

Finally, we have made several assumptions regarding the costs of taxation and of production/distribution. We assumed that taxation incurs a convex cost $G(\cdot)$. Our results are unchanged if either there is no such distortion or if there are separate tax distortion functions for general redistributive taxation and for targeted taxation.

The assumption that there is a cost c associated with each targeted good is, on the other hand, essential to our comparative statics results with respect to diversity. Without it the extent of the diversity of tastes within the coalition would not play a role since the cost of providing targeted goods would not depend on taste heterogeneity. The specific way in which these costs are modelled, however, is not essential. They can be modelled as the cost of production, the cost of targeting redistribution, or as the cost of organizing an interest group. Furthermore, they need not be fixed costs. Rather, our results require the weaker property that the total cost of providing a given quantity of targeted redistribution per individual increases with taste diversity.

7 Conclusion

This paper shows that at low levels of diversity, targeted redistribution and the provision of specific goods (e.g., local public goods) is an equilibrium phenomenon. This arises either when the rich and some poor interest groups form a winning coalition or when the interest groups themselves form a winning coalition if their share in the population exceeds a majority. In the former case, the rich trade-off providing specific targeted goods in exchange for lower overall taxation and the interest groups sacrifice some general redistribution which would favor the poor overall. At higher levels of diversity, the funding of these specific goods increases at the expense of general redistribution, making the excluded poor worse off as diversity increases. For societies which are very diverse, on the other hand, no such coalitions can be sustained. The unique equilibrium consists of zero targeted redistribution and the winning policy serves instead the "common" interest of the poor.

Our results suggest that examining directly the empirical relationship between targeted transfers, non-excludable public goods, and measures of diversity (targetability) may be fruitful. Although the relationship between diversity, income heterogeneity and policy outcomes has not itself been the direct object of empirical analysis, our results may nonetheless help shed light on some empirical findings in the literature.[19] For example, Easterly and Levine (1997) find a strong negative correlation across countries between ethnic fragmentation and the provision of public goods (e.g., education and infrastructure) and Alesina, Baqir, and Easterly (1999) find a similar relationship across states in the US.[20] In our framework, we can think of education, health, or infrastructure (roads, telephones, etc.) as corresponding to the good provided by general redistribution and other government transfers as corresponding to our targeted goods and thus would be in line with these predictions. In addition, Alesina, Baqir, and Easterly (2000) find that public employment in US cities - which they interpret as targeted transfers - increases with ethnic fragmentation. This is also consistent with our model.

In general, our model predicts that low diversity should be associated with high general distribution (e.g., Scandinavian countries) and high diversity should be associated with targeted transfers and a low level of general public goods (e.g., several African countries). Whether, at some higher degree of diversity, general redistribution once again becomes dominant has not be tested in the empirical literature. One can imagine that, at some point, groups put away their myriad special interests in order to protect their common interest (and political parties or trade unions become organized along class lines rather than across ethnic cleavages), but this remains to be shown empirically. An interesting example may be the relationship between the state and religious groups as a function of the degree of religious diversity in the country. In countries in which there is a large dominant religious group (e.g., Israel) there is relatively small separation between state and religion and the latter benefits from important transfers from the state. In

[19]See Alesina and La Ferrara (2004) for a survey of the theoretical and empirical literature of ethnic diversity and economic outcomes.

[20]See also Alesina, Glaeser, and Sacerdote (2001).

countries in which there are many religious groups (e.g., the US), state and religion are separate and transfers to religious groups are relatively low.

In the future it would be of interest to explore how our results change with different electoral rules or forms of government and to extend the political model to allow for endogenous party formation in a non-cooperative game.[21] Endogenizing the number of different specific interests who are represented in the political process would also be an important extension, as an alternative interpretation of our interest groups is that these are agents that have found it in their interest to form a "targetable" group. Such a model would be considerably richer as it would allow one to explore the relationship between endogenous and exogenous diversity, party politics, and redistribution.

[21] For a survey and analysis of the effect of electoral rules on economic outcomes see Persson and Tabellini (2000).

Appendix

1. Proofs of Lemma 4 and Lemma 5:

Proof of Lemma 4: Fix a partition and any two (feasible) platforms, x and y, offered by parties X and Y. Suppose first that R belongs to one of these two parties. By Lemma 1, the excluded interest groups and P_0 share the same preferences ordering over these platforms. Suppose next that the x and y platforms are offered by two interest group coalitions either with or without P_0. Let platform x be the platform with the higher level of T. By (9) , x must have a (weakly) lower level of τ than y has. Hence, all poor agents who are not represented by either X or Y prefer y to x, as do the rich since by (9) , y has no higher a level of $T + \tau$ than x.||

Proof of Lemma 5:

Case i: Suppose first that a poor agent who does not belong to party X votes for x. By Lemma 1, excluded agents receive zero targeted transfers and consequently any poor agent who belongs to X must prefer x to the alternatives as well. If a rich agent belongs to X, then all alternative parties must be composed of only poor agents. For the poor excluded agent to prefer x to these other platforms, it must be that other platforms propose no lower level of total taxation and a worse mix of targeted and general taxation. Hence the rich must also prefer x.

Case ii: Next suppose that the rich are excluded from party X, yet platform x receives their votes. Since in this case party X must represent some interest group(s) or P_0 or a coalition of the two, the total sum of its taxes must equal at least τ^*. Given that the rich prefer x to all other platforms that are offered, then their own party is either not offering a platform or, if it is, the party must be a coalition with a platform consisting of a worse mix of targeted and general taxes, and the remaining alternative parties must be offering higher levels of T (if they are offering platforms). But this implies that a poor agent who belongs to X will also prefer x to the alternative platforms offered.||

2. Characterization of the Pareto set for the coalition of R and P:

First, consider policies to the left of the $q = 0$ line. Such policies with $(T' > 0, \tau')$ cannot be on the Pareto set. For any such policy, a policy with $(0, \tau')$ constitutes a Pareto improvement for R and P. Consider policies on the $T = 0$ line. As explained in the text, such policies are part of the Pareto set for some $\tau \leq \tilde{\tau} < \tau^*$. To compute the bound $\tilde{\tau}$ we look at the set of indifference curve of R such that each passes both through $(0, \tau)$ for some $\tau < \tau^*$ and through some policy $(T > 0, \tau')$ to the right of the $q = 0$ line which makes P_k better off relative to $(0, \tau)$. The limit $\tilde{\tau}$ is the one that corresponds to the indifference curve associated with the highest level of indirect utility for R.

Second, consider policies to the right of the $q = 0$ line. We have claimed that the only relevant region for the Pareto set is the region to the left of both the T^* and the τ^* lines. Consider now the region to the right of the T^* line but to the left of the τ^* line. In this region, the slope of the indifference curve of P is

$$-\frac{-\underline{y} - G' + V'\frac{\mu}{k}}{-\underline{y} - G' + \mu} > 0$$

whereas the slope of the indifference curve of R, $-\frac{-\bar{y}-G'}{-\bar{y}-G'+\mu}$, is negative. This means that there can be no tangency of indifference curves in this region. Moreover, boundary points with $(T, \tau = 0)$ also cannot be part of the Pareto set since $(T', 0)$ for $T' < T$ will be a Pareto improvement for both R and P (because these policies are to the right of the T^* line).

Similarly, for the region to the right of the τ^* line but to the left of the T^* line, the slope of the indifference curve of P is positive and that of R is negative and thus no tangencies can occur (there are no boundary point). Finally, for the region of points which are to the right of both the τ^* and the T^* lines, since both indifference curves are convex towards $(0, 0)$, a Pareto improvement would consist of switching to a policy on either the τ^* or the T^* line.||

3. Proof of Proposition 3.

Let N^* denote the level of N such that r and p are tangent. Thus N^* and the associated policy $(\widehat{T}, \widehat{\tau})$ solve (p), (r), and

$$\frac{-\bar{y} - G'}{-\bar{y} - G' + \mu} = \frac{-\underline{y} - G' + V'\frac{\mu}{k}}{-\underline{y} - G' + \mu}$$

Since the egg shaped p curve "shrinks" with N, then for all $N > N^*$, there are no policies in the Pareto set of R and the P_k's which satisfy both r and p.||

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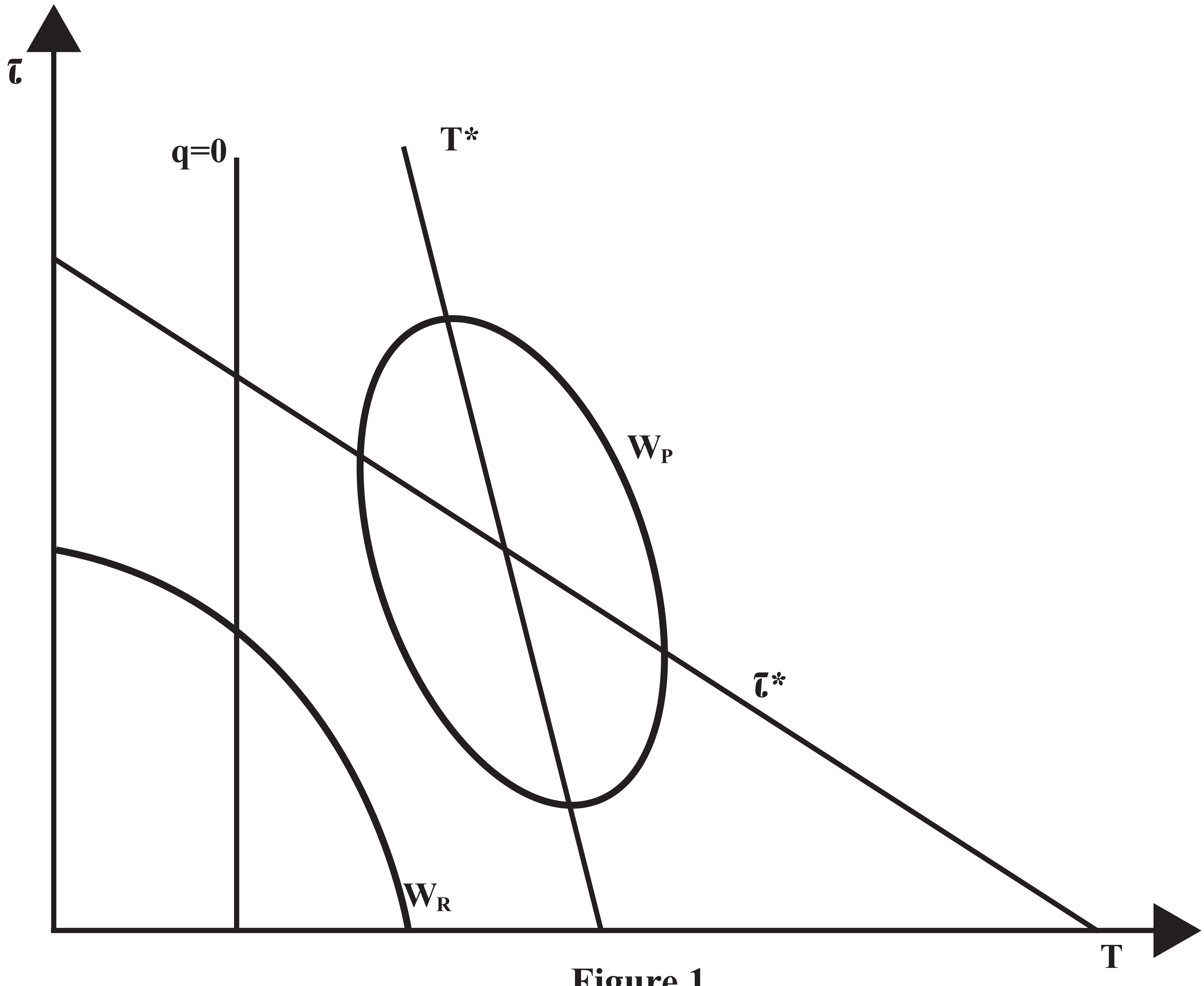

Figure 1

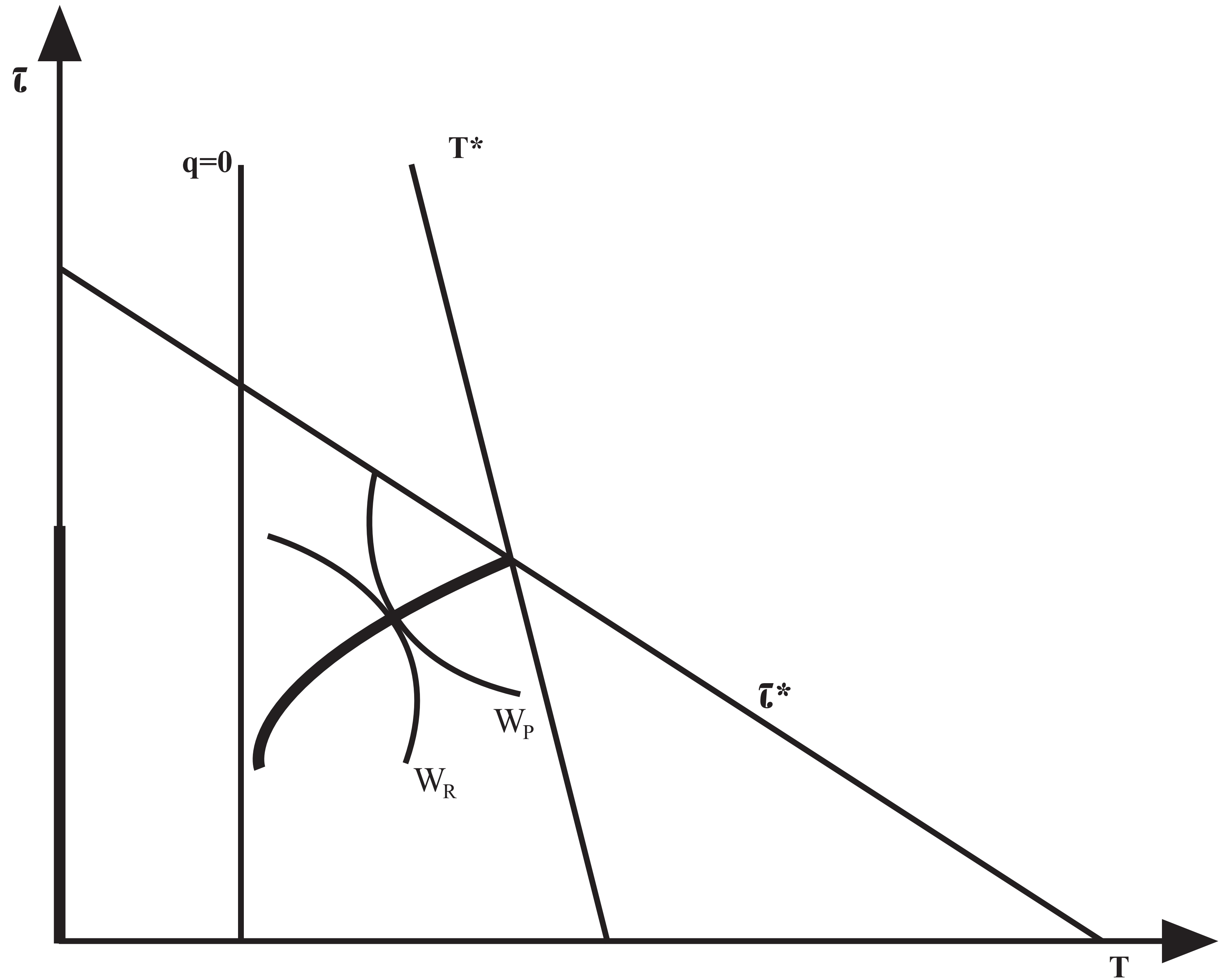

Figure 2

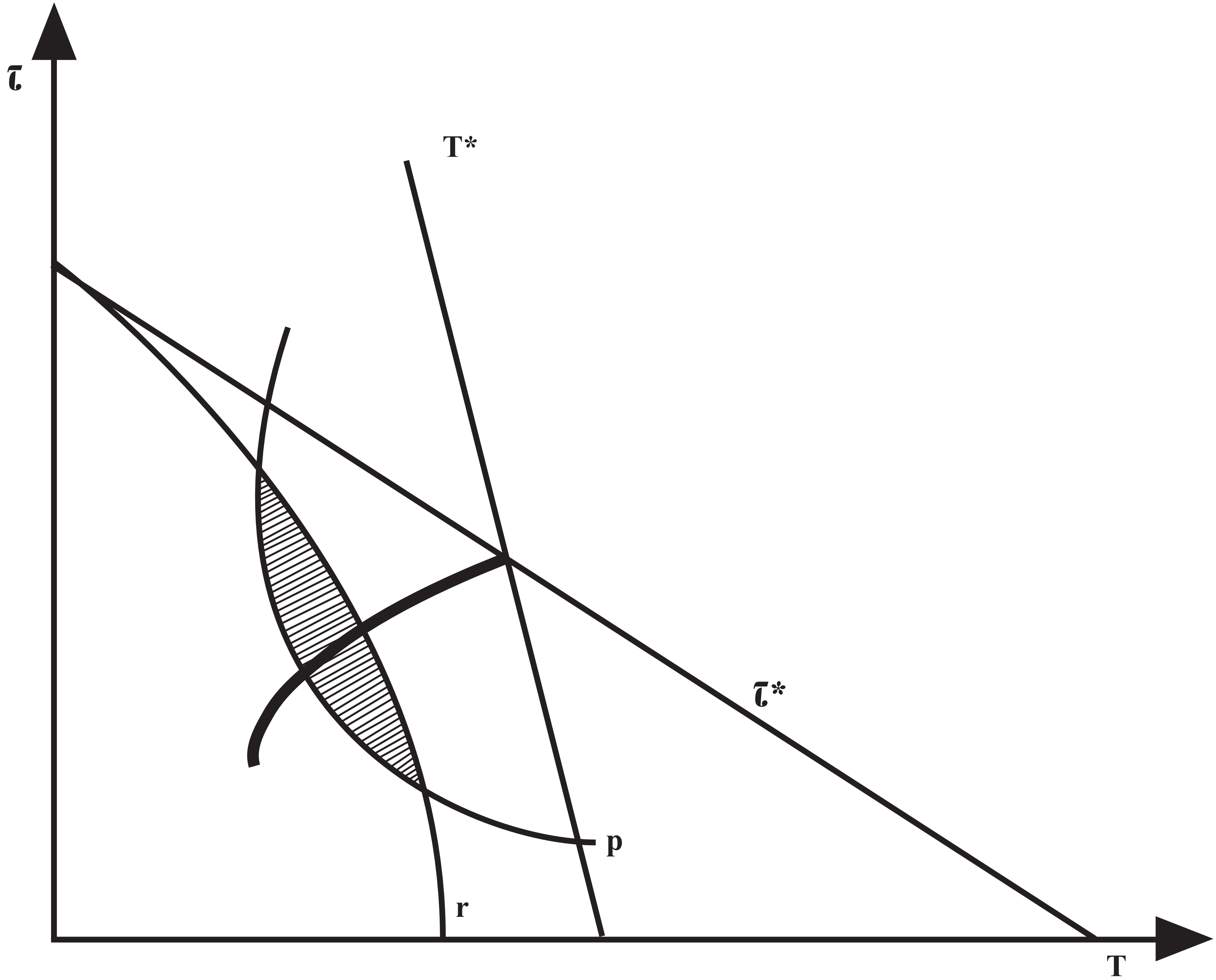

Figure 3

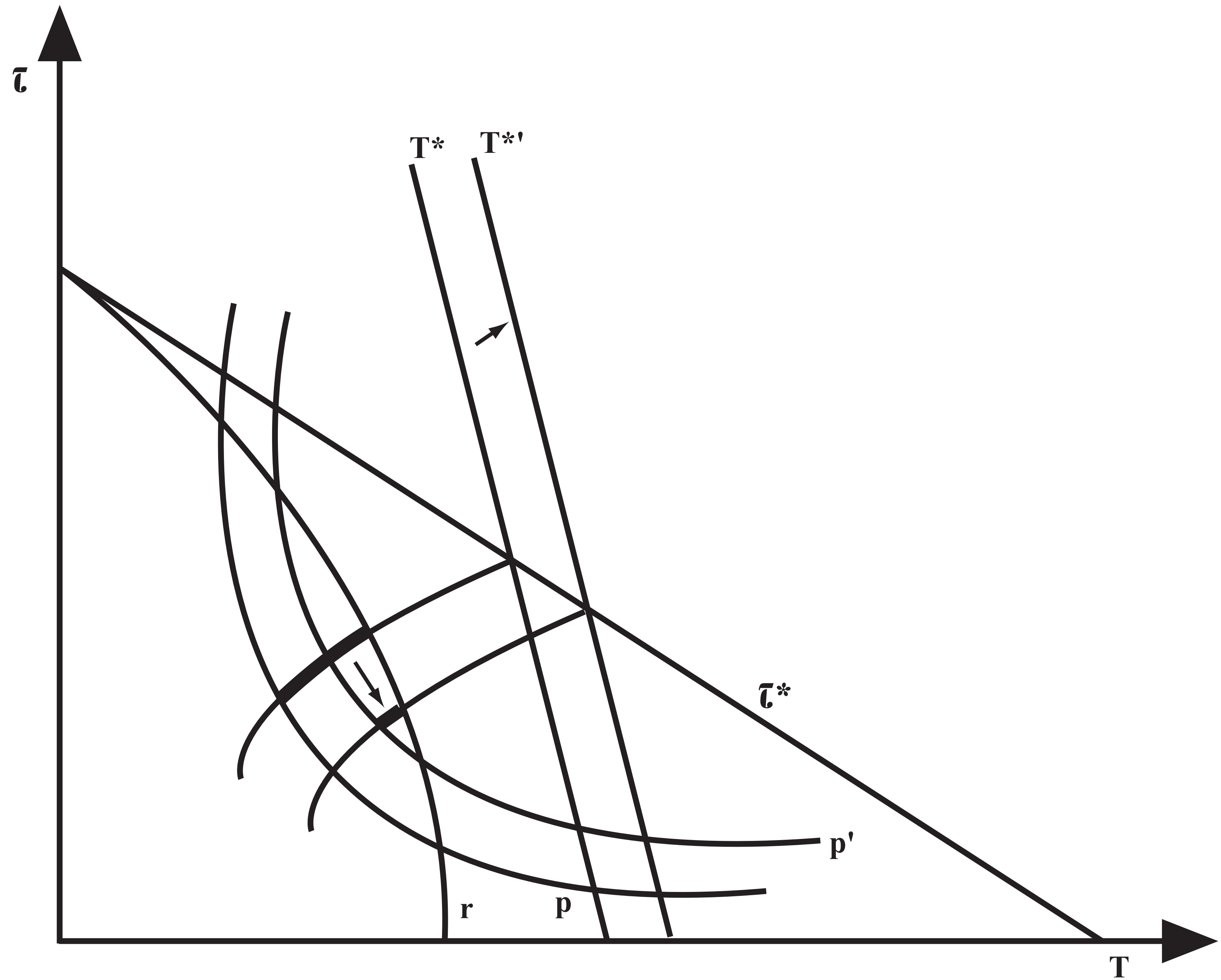

Figure 4