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ON REDISTRIBUTION**

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ABSTRACT

Class and Tastes: The Effects of Income and Preference Heterogeneity on Redistribution*

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 and, conversely, whether income inequality affects which preferences are given precedence in society. 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. Individuals differ both in income and also as to whether they receive utility from some specific good.

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 distribution and some targeted transfers. As a group, however, the poor obtain less income distribution than if taste heterogeneity did not exist. 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, these policies are not sustainable. There exists a critical threshold of diversity above which 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 taste diversity at all.

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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 how differences among individuals are resolved has played a critical role in our attempts to understand society.

How do differences in preferences affect the conflicts that arise from differences in income? Alternatively, how do income differences affect the ability of individuals to resolve differences in tastes? The existing literature is, for the most part, unable to answer these questions either because the models cannot handle multidimensional sources of heterogeneity or because the authors abstract away from alternative sources of heterogeneity in order to focus on one dimension. To understand many conflicts, however, incorporating both sources of heterogeneity may be crucial.

Does preference heterogeneity (arising, for example, from membership in different ethnic groups or residence in distinct geographic locations) affect the ability of the poor to extract resources from the rich? That is, while the poor in society may coincide in their desire to redistribute away from the rich, how does conflict over how they would wish to allocate those resources matter? Alternatively, how does income inequality affect which tastes are given precedence in society? More generally, how do class and preference conflicts interact? On the one hand, one may intuitively 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 opposite intuition is also possible: it may be that the presence of "greedy" special-interest groups drives wealthier individuals in society to form a coalition with poorer individuals if the latter are less expensive to accommodate. A last possibility is that the presence of taste conflict simply leads to even more redistribution as there are more 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. In our economy the government can both redistribute income (or, more generally, invest in a publicly provided good to which all individuals have equal access, e.g. public health or public education), and also fund special-interest projects, all from proportional income taxation. Individuals differ in income (they can be either poor or rich) and also in which special interest project (if any) they would obtain utility from. The ability to enjoy a particular special-interest project can be thought of as arising from preference heterogeneity as a result of different ethnic or religious affiliations, for example, or from differences in geographic location. Redistributing towards an interest group is assumed to entail a fixed cost (e.g. the additional cost of tailoring the good to particular tastes or the cost of organizing an interest group).

We study the equilibrium of a game in which individuals (and 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 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 whose revenue is used to fund the specific (targeted) goods tailored to particular preferences or localities.

We show that in the absence of coalitions of more than one type of individual there is a unique equilibrium outcome in which a party representing the poor wins with a policy of maximum general redistributive taxation. Some agents, however, have an incentive to form a coalition in order to overcome this policy. In particular, when the share of the interest groups in the economy is not too large, a unique heterogeneous political coalition emerges consisting of an alliance between the rich and some of the interest groups. A coalition between the poor and some interest groups, by way of contrast, is never a feasible equilibrium outcome. As we show, in that case there is always a temptation for some subcoalition to secede and make its members better off. We thus focus on the equilibrium platforms offered by the heterogeneous political coalitions and examine how their policies are affected by the degree of diversity.

Our analysis demonstrates that the intuitions expressed previously capture important elements of the analysis of the effect of preference diversity on class politics: increased taste conflict first dilutes but later reinforces class interests. When the degree of taste 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 distribution than if preference heterogeneity did not exist and the rich pay a lower level of total taxes. As taste 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 taste diversity at all. Thus, while at first increased taste diversity destroys solidarity among different groups of poor individuals, at a sufficiently high level of taste conflict diversity in preferences is ignored and the traditional class conflict regains its primacy.

When the measure of individuals that belong to interest groups is large, the same heterogeneous coalition exists, with the same comparative statics behavior. In addition there may exist another heterogeneous coalition composed solely of different interest groups–the "interest groups" coalition. The policies of this coalition have higher overall taxation than the policies of the coalition between the rich and interest groups, capturing the intuition that class and preference conflict may simply lead to higher taxation. The comparative statics on the policies of this coalition with respect to diversity, however, are very similar to the ones just discussed. Higher levels of diversity are associated with higher targeted taxes and everyone outside the coalition is made worse off. At a high enough level of diversity the coalition collapses and maximum redistribution is the unique outcome.

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 when the share of the interest groups in the economy is not very large and in section 5 we examine in depth the effect of diversity on the unique coalition that emerges under these circumstances. Section 6 extends the analysis to the case in which the share of the interest groups in society is large. We discuss our main assumptions in section 7 and conclude.

2 Related Literature

Our paper is related to a recent theoretical literature on the provision of public goods. Alesina, Baqir, and Easterly (1999) provide a model that shows that increased taste diversity leads to a lower level of provision of a public good. In their median voter model, individuals can choose only one of many possible public goods to fund and have different valuations 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 is endogenous and it is the tradeoff between the level and number of these goods that are funded relative to the non-excludable public good that is of primary interest. The decline in spending on the non-excudable public good results from the need to satisfy a growing number of special interest groups and to maintain the rich in the coalition rather than from an increased variance in preferences.

A related paper is by Lizzeri and Persico (2002). They also 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.[1] The reason is that when the number of parties increases, each party can only cater 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. In their model, however, all voters are homogeneous and hence, in contrast to our paper, they cannot analyze the effect of diversity on redistribution.

Several papers have also examined redistribution in a multidimensional context. Roemer (1998) examines how the existence of issues 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 the non-economic issue is sufficiently important (see also Besley and Coate (2000)). Austen-Smith and Wallerstein (2003) likewise examine how general redistri-

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

bution is affected by the existence of another characteristic (e.g. race) in a model of legislative bargaining with an exogenous number of legislators. Unlike in Roemer's model (but as in our model), this characteristic matters only for economic reasons (in particular, because legislators can choose what level of affirmative action to support where the latter guarantees a proportion of jobs with economic rents to a particular group). Assuming that a legislator represents either high human-capital Whites, low human-capital Whites or Blacks (in which case they maximize 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—low human-capital Whites. Our model differs from theirs both by allowing the interests of parties to be endogenously determined and by assuming policy is the outcome of an electoral system. Our model is also a simpler one in which one can ask how changes in the level of diversity (the number of distinct interests) matters to equilibrium outcomes.

3 The Model

3.1 The Environment

The economy is populated by three general types of agents with total measure one. A proportion λ has income $\bar{y}$, and the remainder has income $\underline{y} < \bar{y}$. We call the first group the "rich" and the second the "poor". We assume that the poor are a majority, i.e., $\lambda < .5$, but, as will be clear further on, this group is not homogeneous.

There are two types of goods in the economy. One is a consumption good, x. All agents derive utility from this good. The other set of goods, "targeted goods", is indexed by i. To simplify our model, we will assume that the rich only derive utility from x, as does a segment of the poor.[2] A proportion of the poor, on the other hand, derives utility from targeted goods. Such goods can have for example features which are specific for consumption in different geographical areas or for groups from different ethnicities. We will call these types of individuals "special interest groups".[3] Special

[2] See section 7 for a discussion of this assumption.

[3] An alternative way to think about the targeted goods is simply as transfers which can be targeted to particular interest groups. According to this interpretation, some groups in the population can be targeted whereas some cannot.

interest group i, derives utility both from x and from targeted good i. Thus, for the special interest groups, preferences are given by

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

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

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

We assume that the share of all interest groups is less than half the population. Section 6 examines the case in which the share of these groups exceeds 0.5.

Before describing the particular process that gives rise to political parties, we first turn to the policy space. We assume that there are two types of tax instruments available to the population: a redistributive tax, used to finance the general good and a set of taxes, t_i, used to finance targeted good i.

The production of the general public good entails a fixed costs and a contant marginal costs which we normalize to 1. Thus, given a general tax τ and mean income $\mu \equiv \lambda\overline{y} + (1-\lambda)\underline{y}$, the total amount of the general public good which can be produced with the revenue $\tau\mu$ is

$$h_0(\tau\mu) = \tau\mu - c_0$$

Similarly, the production of a targeted good i entails a fixed costs and a constant marginal costs normalized to 1. Thus, given a specific tax t_i, the amount of a specifc good i which can be produced with the revenue $t_i\mu$ is

$$h_i(t_i\mu) = t_i\mu - c_i$$

For simplicity we assume $c_i = c$ for all i.

The fixed costs of producing the general public good play no important role in the analysis (when an interior solution exists). We will assume henceforth that $c_0 = 0$. Consquently the consumption of the general public by the entire population is given by $\tau\mu$ whereas the consumption of targeted good i by the specific group i is given by

$$q_i = \begin{cases} \frac{t_i\mu - c}{n_i} & \text{if } t_i\mu \geq c \\ 0 & \text{if } t_i\mu < c \end{cases} \tag{3}$$

where n_i is the number of individuals in specific group i, $i \in \{1, 2, ..., M\}$.

In addition taxation is also assumed to be distortionary in the sense that it wastes resources of $G(\tau + T)$ per capita, where $T = \sum t_i$. G is assumed to be an increasing, convex function with $G(0) = 0$, $G'(0) = 0$, and $G'(1) = \infty$. Such costs can represent the standard costs of the collection and the enforcement of taxation. In a more elaborate model, these could be the costs associated with the loss of output incurred when endogenous labour supply is distorted by taxation.

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

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

$y \in \{\underline{y}, \overline{y}\}$, whereas for the interest groups:

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

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

3.2 The Political Process

We analyze a political process which results in an equilibrium that consists of a set of parties (a partition on the set of all agents in the economy) and the platforms they offer. Keeping with the basic citizen-candidate model (see Besley and Coate (1997) and Osborne and Slivinski (1996)), we assume that parties that consist solely of a single agent can only commit to her preferred policy. Similarly, parties which consist of homogeneous agents who belong to the same group can commit to offer only the ideal policy of this group. A party consisting of agents from different groups, on the other hand, as in Levy (2004), can commit to any policy on the Pareto frontier of the members of the party.

We first consider a fixed partition of all agents into parties and define an election game between the parties (including one-member parties). Conditions (i) and (ii) below would define a candidate for an equilibrium for a fixed partition. We then allow agents to change their party membership and define an equilibrium as a candidate for an equilibrium which also satisfies some stability condition regarding party membership, condition (iii) below. To rule out equilibria that would emerge as a consequence of a party capturing all members of one group of society and thus not allowing competition from this group, we only analyze partitions in which at least one solitary member of each group is a possible candidate-party who may or may not offer a policy in equilibrium.

Consider then the following election game for a given partition of all agents into parties. In this game, parties simultaneously choose whether to offer a platform or not (and what platform to offer). For simplicity, we assume that given the set of policies offered, individual voters vote sincerely. In particular, independently of party membership, individuals vote for the platform they like most, as given by their utility functions above. The winning policy is then chosen by plurality rule; if there is more than one winning platform, then each is chosen with equal probability. If no platform is offered, a default status quo policy is implemented.[4] For simplicity, there are no costs of running for election or benefits from holding office.

A *candidate for equilibrium*, χ, is a set of policies offered by the parties in the partition, which satisfies conditions (i) and (ii):

(i) 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 improves the utility of all of its members, for at least one of them strictly.

(ii) For each party, when taking the other platforms as given, if the set of winning platforms is exactly the same when it offers a platform and when it does not offer a platform, it chooses not to offer a platform.

Conditions (i) and (ii) characterize a set of candidates for equilibrium for any given partition.[5] Parties however are endogenous in our model in the sense that such partitions can be stable only if there is no subcoalition within a party that can profitably split from its party, as specified in condition (iii).

(iii) A candidate for equilibrium in a given partition, χ, is an *equilibrium* if there does not exist a subcoalition within a party that can split and, by so doing, induce a candidate for equilibrium χ' which makes all of the members of the subcoalition weakly better off.

Condition (i) is a "party best response" condition which asserts that for a given partition, and taking other platform as given, each party member has a veto power concerning deviations. Similarly, single member parties who offer a platform or not

[4] We assume that all agents prefer their own ideal point to the default policy. The exact nature of the default policy plays no role in the analysis.

[5] We have yet to establish existence of such a candidate for equilibrium for any partition. In any case, for the economic environment we study a candidate always exists.

should find their action optimal, taking other platforms as given.[6] This implies that in any candidate for equilibrium there is at least one platform offered. When no platform is offered, any agent would prefer to run and win for sure with her own ideal policy.

Condition (ii) is a tie-breaking rule. Whenever all party members are indifferent between offering a platform and not doing so, it is reasonable to break ties by assuming that 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 will not alter our result). This assumption also simplifies the analysis by reducing the number of equilibria.

Note that our stability condition, condition (iii), allows that following a party split, the remaining parties (including the remainder of the original party) can modify their offers in response to this deviation. That is, the deviators take into consideration that following a break-up, the platforms in the new partition must satisfy (i) and (ii).

Finally, note that the stability concept is "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.[7] This also allows us to reduce the number of equilibria and simplifies the analysis as seen below in Lemma 1.[8]

Prior to presenting the lemma, note that homogeneous parties that are composed of agents from the same group do not play an important role in our analysis since the policy they can offer is the same as that a single agent party can offer. Henceforth, we reserve the use of the term "coalitions" to describe heterogeneous parties.

Lemma 1 *Generically, in a pure strategy equilibrium:*

(i) Exactly one platform is offered and it wins the election.

[6]Note that if a single-member or homogeneous member party offers a platform, the policy offered must be the ideal point of the agent.

[7]Note that our stability concept allows only for party break-ups and not for the formation of new parties. The main reason is that in multidimensional policy space, a stability concept which allows for all type of deviations will typically result in no stable outcomes (see section 7 for discussion of robustness to other stability concepts).

[8]But as can be seen from the proof of Proposition 1 later on, this assumption will play no further role in our results.

(ii) At most one coalition exists and it wins the election.

Proof: (i) We have already established that at least one platform is offered in equilibrium. In a pure strategy equilibrium, a candidate for an equilibrium χ has either one policy offered or a set of policies which tie. Generically though, platforms will not tie. Thus one platform is offered and it wins. (ii) By the first part of the Lemma, one platform is offered in a pure strategy equilibrium, it wins, and it can be offered by a many-member party or by a single-member party. Suppose that there exists a coalition C which does not offer a platform in an equilibrium in which some platform x is winning. Then there must not exist any subcoalition of C which can split from C and increase its members' utilities (since otherwise x would not be an equilibrium). This means that if C were to split in some way, then x would still satisfy (i) and (ii) in the new partition. Thus, the stability condition requires this coalition to split since its members are (weakly) better off and hence C cannot be sustained.||

As manifested in the lemma above, our assumptions imply that coalitions or many-member parties do not just stick around without offering a platform. To be fair, however, we should note that jsimply existing as a coalition even without offering a platform may be a reasonable strategy for a party since its mere existence can serve as a threat for other parties when they choose their platforms or contemplate break-ups. However, the equilibria of our analysis would remain equilibria even if we allowed parties to stick around. What our assumptions do, therefore, is to rule out some additional equilibria that may exist otherwise.

4 The Political Equilibrium

In order to solve 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 $(\tau, t_1, t_2, ..., t_M) = (0, 0, 0, ...0)$. The group of poor individuals who does 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". Lastly, a poor individual who belongs to interest group i, P_i, has an ideal policy $\left(\widetilde{\tau}, 0, 0, \widetilde{t}_i, ...0\right)$

$$\mu - \underline{y} - G'(\tau + t_i) = 0 \tag{7}$$

$$-\underline{y} - G'(\tau + t_i) + \frac{\mu}{n_i} V'(q_i) = 0 \tag{8}$$

Note that $\widetilde{\tau} + \widetilde{t}_i = \tau^*$.

We now solve for the political equilibrium. One uninteresting case to consider is when at least half the population belongs to P_0 as the only equilibrium is then maximum redistribution. We henceforth assume that P_0 has less than half the population.

Lemma 2 *R prefers maximum redistribution to any policy that can be offered by any coalition consisting solely of some P_i groups.*

Proof: By (7) and (8), the Pareto set of a party consisting solely of some P_i groups has policies with total taxation that is at least τ^*. However, unless this coalition is at a corner solution with all $t_i = 0$, some of that redistribution is targeted. Thus, R is at least weakly better off under maximum redistribution.||

Lemma 3 *If group P_i is restricted to a policy that yields $q_i = 0$, its preferred general tax rate is maximum redistribution, τ^*.*

Proof: Follows directly from (7).||

It follows from Lemmas 2 and 3 that maximum redistribution is always an equilibrium of this model since the equilibrium of a partition with no coalitions is maximum redistribution independently of the size of P_0. In this equilibrium, an agent belonging to P_0 offers its ideal policy of maximum redistribution and wins. This policy is preferred by all the poor (independently of whether they belong to an interest group) to the ideal policy of R. It is also preferred to an ideal policy of P_i by all other poor agents and by the rich. This is stated formally in the lemma below.

Lemma 4 *Whenever P_0 competes against parties that are homogeneous in their membership, P_0 wins and thus maximum redistribution is the unique equilibrium.*

The proof follows from the above discussion. As we now go on to show, there is only one type of coalition that can beat P_0–a coalition between R and some P_i groups. Recall that by Lemma 1, only one platform is offered in a pure strategy equilibrium and that no other coalition runs against it. Hence we can confine our analysis to partitions in which there is only one coalition. To characterize these partitions, it is useful to introduce an additional concept. We say that a coalition represents m groups if in the coalition the number of different preferences of agents in the coalition is m. Let us define a coalition representing m groups as a "minimal winning coalition" if the population of the $m-1$ groups is less than .5 and the population of these m is no smaller than .5.

Proposition 1 *In all pure strategy equilibria in which a coalition wins, the winning coalition is a minimal winning coalition composed of R and a number of P_i groups. This coalition offers a policy with positive targeted transfers and lower total taxation than τ^*. The policy must satisfy conditions r, p_i, and p_0 below.*

Proof: Consider a coalition of R and some P_i groups. An implication of Lemma 3 is that this coalition cannot win if it does not represent a majority of the voters, since P_0 and all excluded P_i would prefer maximum redistribution to any policy feasible for the coalition. Note that since P_0 does not capture a majority of the population, indeed such a coalition can represent a majority of the population. Suppose that the coalition is a minimal winning coalition (we will establish further on that this must be the case). Then this coalition can offer policies $(\hat{\tau}, \hat{t}_1, ..., \hat{t}_M)$ that belong to its Pareto set and that satisfy the conditions below:

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

$$\underline{y}(1-\hat{\tau}-\sum \hat{t}_i)+\hat{\tau}\mu - G(\hat{\tau}+\sum \hat{t}_i) + V(\frac{t_i\mu - c}{n_i}) \geq \underline{y}(1-\tau^*)+\tau^*\mu - G(\tau^*) \qquad (p_i)$$

The first condition, (r), describes the set of policies that an R agent prefers to the policy of maximum redistribution. The second set of conditions, (p_i), describes the set of policies that an agent belonging to P_i prefers to the policy of maximum redistribution. If there are k different interest groups in the coalition, there are k such conditions.

A last condition that this policy must fulfil in order to be a pure strategy equilibrium is that it must win against a policy of no redistribution $(0, 0, ..., 0)$ offered by an agent belonging to R. In particular, given that R will vote for this policy, in order to win P_0 must prefer the coalition's policy to the ideal policy of R and hence in a pure strategy equilibrium, $(\hat{\tau}, \hat{t}_1, ..., \hat{t}_M)$ must satisfy:

$$\underline{y}(1-\hat{\tau}-\sum \hat{t}_i)+\hat{\tau}\mu - G(\hat{\tau}+\sum \hat{t}_i) \geq \underline{y} \qquad (p_0)$$

Note that no members of the coalition would defect since if some did, the coalition would represent fewer agents (and, in particular, less than half the population), and hence P_0 would win, an outcome which the original coalition members dislike by conditions r and p.[9] Lastly, note that an implication of p_i is that the policy offered must have positive transfers and thus, to satisfy r, must also have a lower level of overall taxation (in both cases strictly lower if p_i is satisfied as a strict inequality).

Suppose now that such a coalition is larger than a minimal winning coalition. Its policy would still have to satisfy conditions r and p_i for a sufficiently large number of groups so that majority of individuals within the coalition supports the coalition against P_0 (recall that all P_i individuals outside the coalition vote for P_0). In addition, its policy would have to satisfy (p_0) so that a majority of voter supports it against R. Then, a subcoalition consisting of R and all the P_i groups for which p_i holds can defect (if this condition holds for all P_i groups, than all of them other than the smallest one can defect) and offer a policy in the new Pareto set that dominates the original one for all members of the sub-coalition and sets the targeted transfer for the excluded interest group(s) to zero. This subcoalition would represent a majority of the voters and this new policy would still satisfy r, p_i for any i for which it was satisfied previously, and p_0.

To see that no other groups can form a winning coalition, consider first coalitions that are either smaller or equal to minimal winning coalitions and that consist either of P_0 with some interest groups and/or with R. These coalitions cannot win in equilibrium since P_0 can defect and win by itself with its ideal policy, given Lemmas 2 and 3. Suppose next that these coalitions are larger than a minimal winning coalition. If the coalition includes both some interest groups and R then either P_0 is better off defecting if the remaining sub-coalition cannot win against P_0 or, if the subcoalition consisting of R and some interest groups could win against P_0, then it is better off defecting. Thus, this coalition is not stable. If, on the other hand, the coalition is between P_0 and only R or P_0 and only some interest groups, then P_0 is better off defecting since, by Lemma 4, it will win on its own.||

[9] Note that when we consider possible deviations we do not examine whether these would lead some other coalition (different than the remaining subcoalitions) to offer a platform that would make the deviators worse off since, by Lemma 1, at most one coalition exists in a pure strategy equilibrium and hence only the two remaining subcoalitions can consist of more than one type of agent.

We conclude that in any pure strategy equilibrium the outcome is either maximum redistribution (when P_0 wins) or a policy consisting of a bundle of specific tax rates and a level of the general redistribution tax (when the coalition wins). However, note that whenever the coalition of R and some P_i can win against P_0 they indeed have incentives to form a coalition (as they are made better off), so that in a more elaborate model of party formation such coordination problems would be resolved and the equilibrium in which P_0 wins would not exist in such cases. We will henceforth ignore the relatively uninteresting equilibrium in which P_0 wins *solely* as a result of no coalition running against it. Instead we will focus on the equilibrium in which we allow the coalition to run and inquire about the circumstances under which this coalition will have an incentive to form or not.

5 Diversity and Redistribution

Our model yields an important prediction regarding the effect of diversity on equilibrium policies. We will show that greater diversity is associated with policies that yield less general redistribution and more targeted redistribution towards interest groups. Surprisingly, however, there is a critical level of diversity beyond which the coalition between interest groups and the rich 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 will restrict our analysis to the case in which interest groups have the same size, $n_i = n$. Furthermore, in order to avoid discontinuity problems that would arise as we change the number of interest groups, we will henceforth treat the number of interest groups as a continuous variable.[10] Letting ϕ be the measure of individuals that belong to interest groups and $\hat{N}$ be the measure of interest groups, we have $\frac{\phi}{\hat{N}} = n$. As the rich constitute a proportion λ of the population, the interest groups in the coalition must represent a proportion $k \equiv 0.5 - \lambda$ of the population and hence a measure N of

[10] The discontinuity would arise because the size of the winning coalition would generically not be exactly equal to 0.5. As the number of interest groups increases, therefore, 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. Note that our preceding results did not depend on whether the number of interest groups was a discrete or continuous variable.

interest groups where the latter is defined by:

$$\frac{\phi}{\hat{N}} N = k \tag{9}$$

An increase in diversity means an increase in the measure of interest groups $\hat{N}$ and hence an increase in N.

We focus exclusively on policies that treat interest groups in the coalition symmetrically, i.e., $t_i = t$. Thus, let $T = \int t_i di = Nt$. Consequently, when we consider the effect of different (T, τ) policies on the welfare of an interest group in the winning coalition, as all P_i have the same induced preferences over these policy bundles, we will use P to denote the generic interest group. We can now rewrite q as total revenue $T\mu$ minus the total redistribution costs cN, divided by the total number of individuals in the coalition belonging to an interest group, k. Thus,

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

which is equivalent to the expression in (3) since $n_i = \frac{\phi}{\hat{N}} = k/N$.

5.1 A Useful Diagram

To think about equilibrium policies it is easiest to do so using the following figures. In Figure 1 we describe typical indifference curves for individuals in the coalition of R and P. The τ^* line gives the locus of (T, τ) that satisfy (7); the T^* curve gives the locus of (T, τ) that satisfy (8). The ideal policy of P lies at the intersection of both curves. 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 T such that $T\mu - cN = 0$.

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

We show a typical indifference curve of a poor individual who is in the coalition, denoted by 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 7), whereas at points of intersection with T^* the slope is zero (see 8). 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 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, 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 part 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 (there cannot be any tangency to the right of these lines, and also boundary points cannot exist to the right of either of these lines). See the Appendix for a complete proof.

We can now describe the feasible policies that the R and P coalition can implement in equilibrium (Figure 3). These are policies on their Pareto set which both prefer to the maximum redistribution policy $(0, \tau^*)$ and which P_0 prefers to $R's$ ideal policy. To find these policies, we simply consider the indifference curve of P which gives P the same utility as the maximum redistribution policy does. This indifference curve which we denote as the p curve, is the locus of (T, τ), satisfying:

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

Second, we have to consider the indifference curve of R which provides the rich with the same utility as maximum redistribution does. The r curve is:

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

Lastly, to ensure that P_0 prefers the outcome to the ideal policy of R, the set of equilibrium policies is bounded as well by:

$$\underline{y}(1 - \tau - T) + \tau\mu - G(\tau + T) = \underline{y} \qquad (\mathrm{p}_0)$$

The shaded area A in the Figure 3 shows the area bounded by these three curves. The set of winning policies consists of the set described by the intersection of the Pareto Set-the bold curve-with A. 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 possible policy outcomes, the WIP set. We will illustrate, using Figure 4, how the WIP set changes with N by consisting of policies with higher targeted distribution and lower general redistribution but eventually resulting in an empty set when N becomes too large.

Note first that an increase in N does not affect the indifference curves of R. In particular both the r curve and the p_0 curve remain unchanged. The indifference curves of P, however, do change and thus also the Pareto set.

To see how the Pareto set changes, let us first start with the ideal policy of P. Note that while an increase in N does not change the τ^* locus, it shifts the T^* locus to the right. To see this, note that the first-order condition implies that total taxation remains constant and hence q^* must also remain constant by (8). Thus, to maintain q^* when N increases, the ideal policy must be characterized by a higher T and a lower τ.

This implies that the new Pareto set lies strictly below the old one. That is, for any T belonging to the old Pareto set, the associated τ is strictly lower in the new Pareto set. To see this, note that P's new ideal policy must lie on the new Pareto set and that it is to the South-East of the old ideal policy. If the entire Pareto set were not below the old set, then the two Pareto sets must intersect at least at one point. But this is not possible since the slope of the indifference curves of R have not changed whereas the slope of the indifference curves of P have changed with N (see below) and thus no point can be common to both sets.

Next we discuss what happens to the egg-shaped p curve. Note that as N increases, the utility from maximum redistribution 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 maximum redistribution. 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. Recall that WIP 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 thus higher

T. In terms of Figure 4, increases in N "shrink" the egg-shaped p curve (note that the reasoning above implies that they cannot cross).

The set of policies in WIP consists of policies in the Pareto set of the coalition bounded by r, p, and p_i. The WIP set is shown in bold in Figure 4. Since an increase in N shifts the Pareto set downwards and shifts 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 set of policies that can be implemented in equilibrium are characterized by higher T and lower τ. Thus as society becomes more diverse, the set of equilibrium policies involve less general redistribution and more distribution towards interest groups. As diversity increases, P_0 and excluded interest groups are in general made worse off.

One may wonder whether this process implies that ever greater diversity will in the limit lead to redistribution only towards interest groups with general redistribution converging to zero. 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 interest groups will break down: ever increasing diversity will not lead to the disappearance of general distribution but, on the contrary, lead to the destruction of the coalition and to the restoration of maximum redistribution.

Proposition 2: *There exists an N^* such that for $N > N^*$, the unique equilibrium is maximum redistribution.*

Proof: See the Appendix.||

As N increases, the r and p_0 curves remain 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 given by either the point of tangency between r and p or, if the entire Pareto set is no longer in the interior of A, it is given by the unique point of intersection of WIP with p_0. For $N > N^*$, WIP is empty. At this point either the coalition breaks because there does not exist a policy that both R and P prefer to maximum redistribution, or the coalition can no longer win with probability one since the poor and the excluded interest groups prefer to vote for R's ideal policy. The sole remaining pure strategy equilibrium is in either case given by maximum distribution and P_0 winning.

The proposition above establishes one of the main results of our analysis, namely, 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 either because a compromise between the rich and the interest groups in the coalition is no longer feasible (in the sense that one of the two groups would prefer maximum redistribution to any policy the coalition can offer), or because the only policies that remain in the Pareto set of the coalition are so costly that the excluded groups actually prefer a policy of no redistribution (the ideal policy of the rich) to the coalition's policies. In this case, the coalition is not able to command a majority of voters since the rich themselves will no longer vote for the coalition's policy.

6 The Case of a Majority of Interest Groups

The preceding analysis was for the case in which the majority of the population did not belong to an interest group, so that the aggregate population share of the different $P_i^\prime s$ was less than a half (but at least $.5 - \lambda$). The analysis of the complementary case, as we now show, yields similar conclusions and some additional interesting results.

To proceed, first note that the same equilibria characterized in our previous analysis are equilibria here as well. In particular, P_0 still wins the election when no political coalitions are formed, and a minimal winning coalition of the rich and several interest groups can form and win by offering specific taxes and some general redistribution if the policy satisfies r, p, and p_0. For this coalition, the effect of increased diversity on equilibrium outcomes is the same as in the preceding analysis. There is also an additional possible 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 hence win the election. We henceforth refer to this coalition as the "interest group coalition".

In order for the interest group coalition to win, its members must prefer its policy to maximum redistribution, i.e., p must hold. Maintaining the assumption of equal treatment for all interest groups in the coalition, we can easily find the equilibrium policy offered by such a coalition of $P_i's$. It is the (unique) ideal policy for the representative group in the coalition. As derived in the preceding analysis, the ideal policy of a poor interest group is given by (7) and (8) at an interior solution. These policies satisfy $T + \tau = \tau^*$ and $q = q^*$. There are also two corner solutions: one with $\tau = 0$ and only (8) satisfied (and thus $T > \tau^*$) and another one with $T = 0$ and maximum redistribution (at which point the policy offered by the coalition is identical to that which would be offered by P_0). Thus, this coalition offers policies with greater total taxation than the coalition of the rich and the interest groups and also, as we show in the appendix, greater targeted distribution than the coalition of the rich with interest groups.

The effect of increased diversity on the equilibrium policy of the interest group coalition can be found by totally differentiating (7)and (8) with respect to N. Note that as N increases so does T. At an interior solution, τ falls and T increases so as to keep total taxation and q constant at τ^* and q^* respectively. Once a corner solution with $\tau = 0$ is reached, greater diversity continues to increase T but not enough to compensate for the increase in N, and consequently q falls. Hence, as in the previous analysis, as long as the coalition is sustained then an increase in diversity results in greater targeted redistribution and (weakly) lower general redistribution so that all individuals outside the interest group coalition are made strictly worse off.

When will the coalition break down? Unlike for the coalition of the rich with poor interest groups, the collapse of the interest group coalition is not because of the failure to find a policy on the Pareto set that makes the coalition members better off relative to maximum redistribution nor because all individuals excluded prefer the ideal policy of the rich to any policy that the coalition can offer. Rather, the breakdown results from the fact that targeted goods are so expensive that the interest groups within the coalition themselves prefer maximum redistribution to targeted redistribution. At this point, maximum redistribution is itself the ideal policy of the coalition.

Note that it is not possible to say which coalition type (rich with interest groups or the interest group coalition) breaks down at a higher level of diversity. This is because although the interest group coalition can choose its preferred policy and thus need not satisfy the constraints of r and p_0, it will also have to distribute targeted goods to a larger number of individuals (since all individuals in the coalition belong to an interest group unlike in the case of the coalition of the rich with interest groups) and to a larger number of interest groups as well. Consequently, the interest group coalition may break at a lower level of diversity than the mixed coalition.

For all diversity levels prior to that which triggers maximum redistribution, the equilibrium policy of the interest group coalition makes the rich strictly worse off than maximum redistribution (since total taxation for the interest groups coalition is no smaller than τ^* and some of the proceeds of the taxation are targeted solely to interest groups rather than being redistributed equally among all). A fortiori, the rich are worse off with the interest group coalition than with the coalition of rich and interest groups. Furthermore, at sufficiently high levels of diversity, the interest group coalition's policies make the excluded poor worse off than a policy of zero redistribution, and a fortiori worse off with this coalition than with the coalition of the rich and interest groups. Thus, it is simultaneously possible for the poor, the rich, and the excluded poor interest groups to be worse off with the interest group coalition than with the coalition of the rich and interest groups, whereas it is never possible for all these groups to be better off under the interest group coalition. This is shown formally in the Appendix.

Our general conclusion remains as in our previous section. As diversity increases, with either type of coalition, there is in general greater targeted redistribution and lower general redistribution. At a sufficiently high level of diversity, the unique equilibrium outcome is one of zero targeted transfers and maximum redistribution.

7 Discussion and Conclusion

In this section we discuss our main modelling assumptions in order to illustrate the robustness of our results as well as to emphasize the crucial assumptions required to obtain them. In terms of the economic environment, we have made some assumptions which simplify our analysis but are not essential to our results. First, we have assumed that all interest groups members have low income. One could also allow interest groups have to have high income as well. In that case, the winning coalition may be composed of the rich interest groups and poor interest groups (with and without the rich). In all cases, we obtain similar conclusions: increases in diversity tend to make excluded individuals (in particular the poor) worse off, but at a sufficiently high level of diversity the coalition collapses and maximum redistribution is the unique equilibrium outcome.

Second, we have considered utility functions which are linear in income or more generally linear in the utility from some common (non targeted) good. This is not important for the analysis and all our results go through if alternatively we let the utilities be concave in income or linear in the targeted good. Thus, our analysis can be applied for cases in which instead of income as in our model, the common good is a good which is universally provided by the government such as health or education.

Our stability concept allows subcoalitions to fragment their parties when they consider deviations but not to form new parties. We need to restrict the possible deviations of coalition members since in our model the core may be empty, as is typical in multidimensional policy space. Note that whenever the core is not empty then the equilibrium outcome of our model is the same as the core (in particular, this is the equilibrium outcome of maximum redistribution) and whenever the equilibrium outcome of the model is determined uniquely at maximum redistribution, then the core is not empty and contains maximum redistribution as its unique outcome.

We have made several assumptions about the cost structure of taxation and production. First, we assume that taxation incurs a cost $G(\cdot)$. As is standard in the literature, we assume that such costs are convex in total taxation. Our results remain the same if one assumes separate tax distortion functions for the general redistributive tax and for targeted taxation.

In addition, we have assumed that there are fixed costs c of producing targeted goods. These costs can be modelled in many different ways. In particular they can be thought of as costs of targeting redistribution or as organization costs instead of fixed costs of production. What is important for our results is that there exists a cost per each group who is a beneficiary of targeted redistribution. The assumption that special interest groups have the same size or that they receive symmetric treatment, on the other hand, is only for expositional ease.

In the future, it would be interesting to explore how our results change with different electoral rules.[11] More importantly, perhaps, a full-fledged model of endogenous party formation with income and preference diversity may yield valuable insights. Our work also suggests that examining directly the empirical relationship between targeted

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

transfers, non-excludable public goods, and measures of preference diversity may be fruitful. Although the relationship between taste diversity, income heterogeneity and policy outcomes has not itself been the direct object of empirical work, our analysis may nonetheless help shed light on some empirical findings in the literature.[12] In particular, we can plausibly think of education, health, or infrastructure (roads, telephones, etc.) as corresponding to our general public good and other government transfers as corresponding to our targeted goods. In this light, our model provides an alternative explanation of the results obtained by Easterly and Levine (1997) and by Alesina, Baqir, and Easterly (1999, 2000).[13] The latter authors also find that total government spending increases with the degree of fragmentation, which is also consistent with the predictions of our model.

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

[13] 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. Alesina, Baqir, and Easterly (2000) find that public employment in US cities increases with ethnic fragmentation. See also Alesina, Glaeser, and Sacerdote (2001).

Appendix

1. Characterization of the Pareto set for the coalition of R and P_i:

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 limit $\tilde{\tau}$ 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_0 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.

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.||

2. Proof of Proposition 2.

Let N_1 denote the largest level of N such that intersection of WIP with p_0 consists of solely one point. Note however that for all $N > N_1$, then this intersection is empty, and in particular, although there may be policies in the Pareto set of R and the $P_i's$ which satisfy p and r, they do not satisfy p_0. This is true because as we show in the text, when N increases, the new Pareto set lies strictly below the old one. That is, for any T belonging to the old Pareto set, the associated τ is strictly lower in the new Pareto set. Since the slope of p_0, $\frac{\underline{y}+G'}{-\underline{y}-G'+\mu}$, is positive, this means that once the intersection of WIP and the p_0 curve is empty, it is empty for higher N as well (recall that p_0 does not change with N). Thus, it is empty for all $N > N_1$.

Let N_2 denote the level of N such that r and p are tangent. Thus, N_2, 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 $N > N_2$, there are no policies in the Pareto set of R and the $P_i's$ which satisfy both r and p. Finally, let $N^* = \min\{N_1, N_2\}.||$

3. Characterization of the policies of the interest group coalition.

(i) The interest group coalition offers policies with greater targeted taxation than the coalition of the rich and the interest groups.

Proof: Let the ideal policy of the poor interest group be denoted by $(\tilde{T}, \tilde{\tau})$. Consider now a coalition the same $P_i's$ as above and now add representatives of R as well (note that such a coalition is greater than a minimal winning). Their Pareto set only contains policies characterized by $T' < \tilde{T}$. To see this, note that $\tilde{T}$ satisfies

$$V'((\tilde{T}\mu - cN)/k) = k,$$

whereas for $T > \tilde{T}$, then $V'((T\mu - cN)/k) < k$. Hence the (absolute value of the) slope of the indifference curve of the poor interest group for $T > \tilde{T}$ is $\frac{-\underline{y}-G'+V'\frac{\mu}{k}}{-\underline{y}-G'+\mu} < 1$ whereas the (absolute value of the) slope of the rich is $\frac{-\bar{y}-G'}{-\bar{y}-G'+\mu} > 1$ so there cannot be any tangency in this region. Thus, such a coalition must have $T' < \tilde{T}$ in its Pareto set.

Lastly, note that coalitions in equilibrium are minimal winning. Thus, when both a coalition of R and $P_i's$ and the coalition of only $P_i's$ exist, then the coalition of R and $P_i's$ must less interest groups than the coalition of only $P_i's$. This means that their Pareto set policies are characterized by T which satisfies $T < T' < \tilde{T}$. Thus, the coalition of only $P_i's$ has larger targeted transfers than that of R and some $P_i's.||$

(ii) The excluded poor can be worse off under the interest group coalition than under zero redistribution. That is, if we define the policies of the interest group coalition that fulfill the first-order conditions by $\tilde{\tau}(N), \tilde{T}(N)$, then:

Lemma 5: For all $N > N_c$, where N_c satisfies $\tilde{\tau}(N_c)\mu - \tau^* \underline{y} - G(\tau^*) = 0$, the poor (and excluded interest groups) are worse off under the policy of the interest group coalition than under zero redistribution if $\underline{y}(1-\tau^*) + \tilde{\tau}(N)\mu - G(\tau^*) + V(q^*) > \underline{y}(1-\tau^*) + \tau^*\mu - G(\tau^*)$ (i.e., if the equilibrium policy of the interest group is different than maximum redistribution).

Proof: The poor are indifferent between no redistribution and the interest groups coalition policy if:

$$\underline{y}(1-\tau^*) + \tilde{\tau}(N_c)\mu - G(\tau^*) = \underline{y}$$

hence,

$$\tilde{\tau}(N_c)\mu - \tau^* \underline{y} - G(\tau^*) = 0$$

Recalling that as N increases, $\tilde{\tau}(N)$ falls, completes the proof.||

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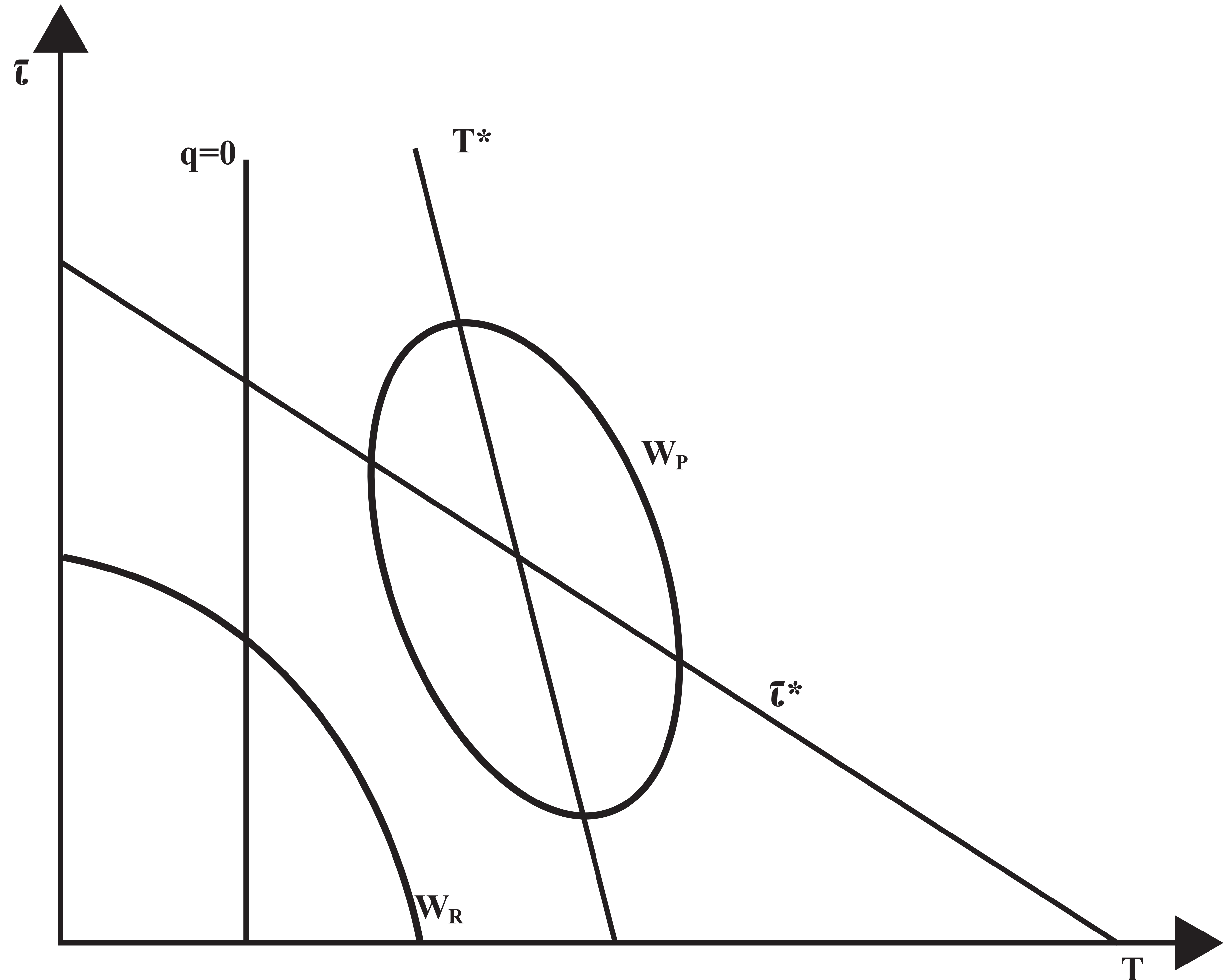

Figure 1

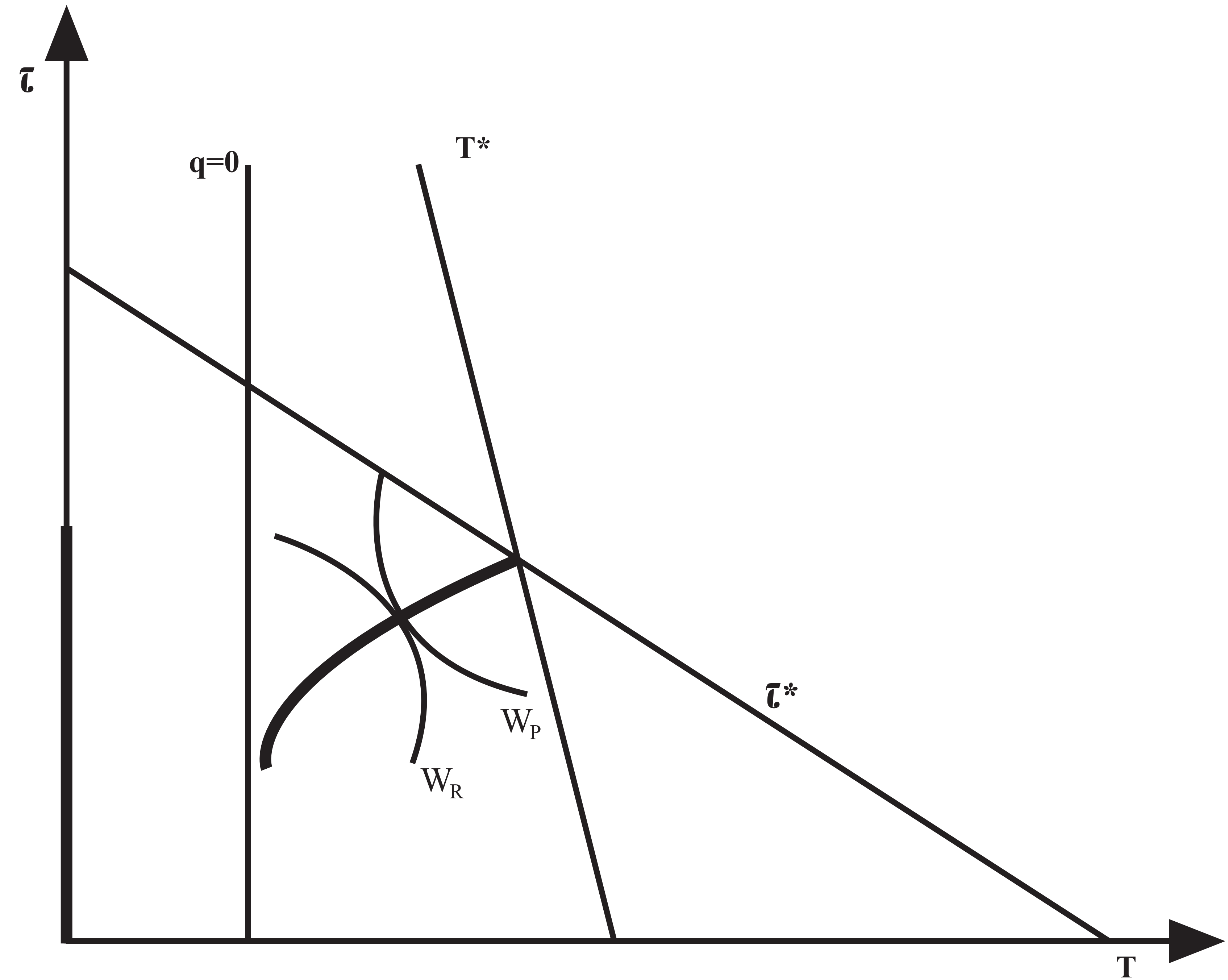

Figure 2

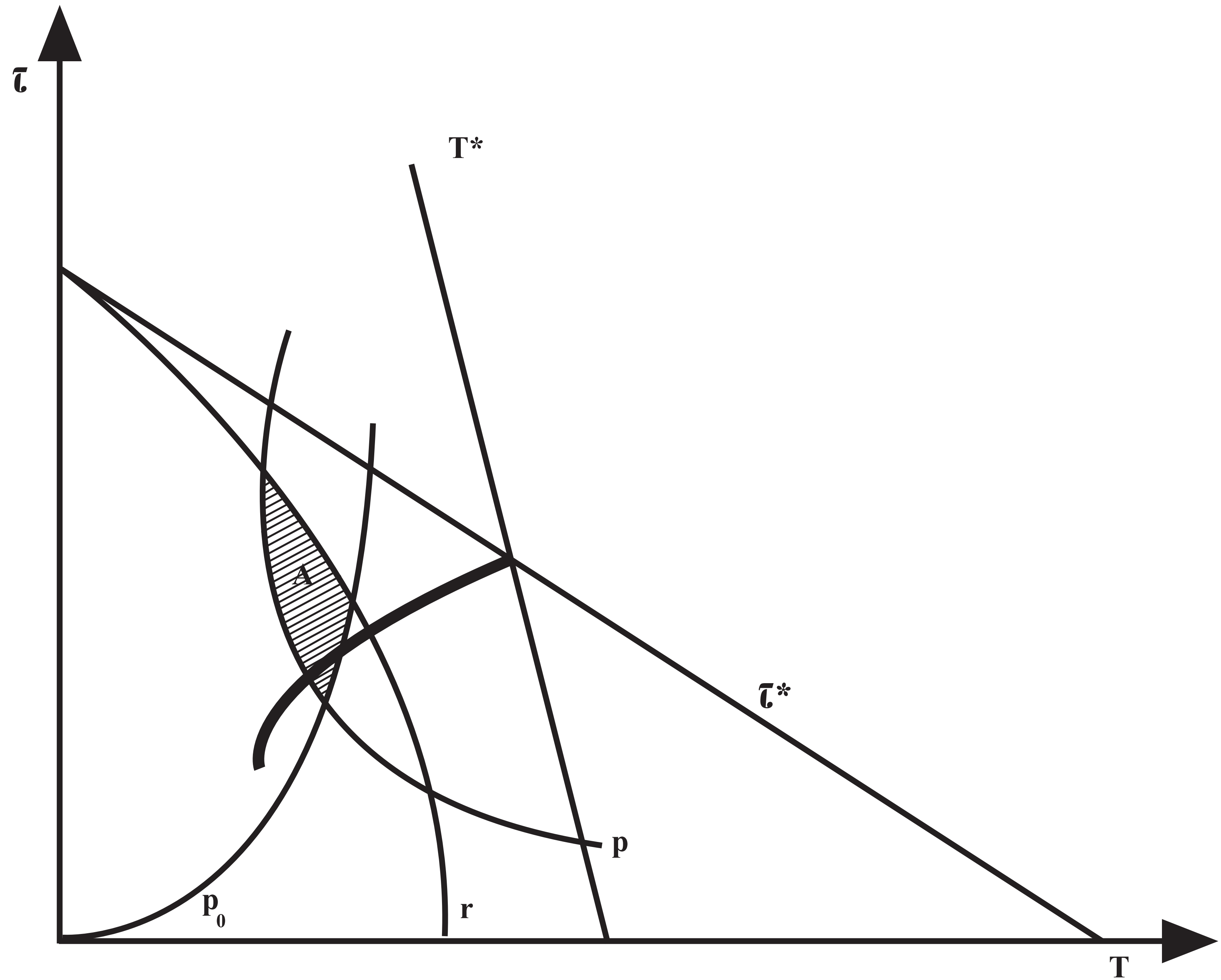

Figure 3

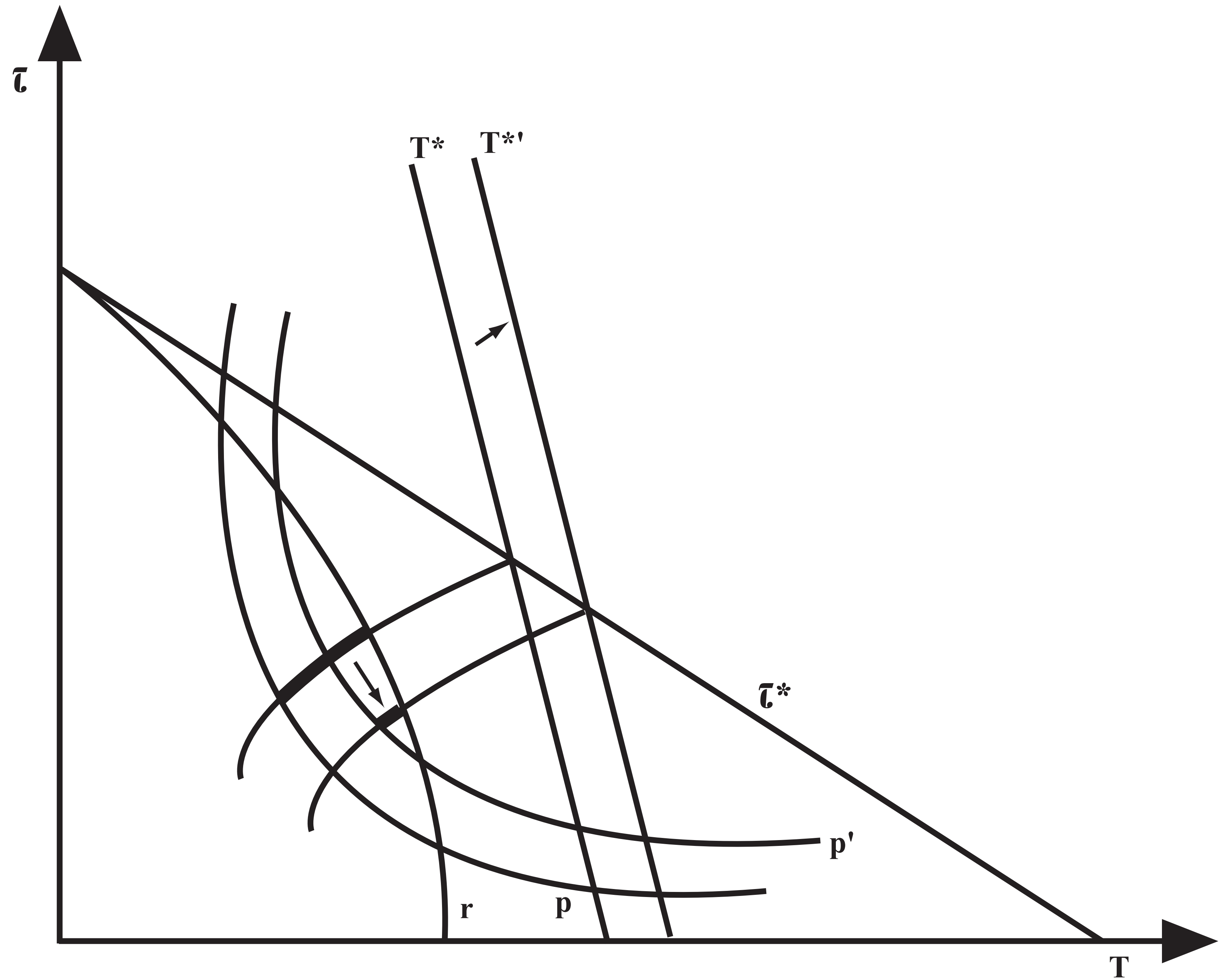

Figure 4