Cooperative minorities and intergroup hostility [+]

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ABSTRACT

In this paper we consider a situation in which the benefits obtained through membership in a minority have the unfortunate side effect of indirectly imposing costs on those same minority members. The central idea links to the issues of envy and hostility, with the latter treated as the behavioral implication of the former. We show the circumstances in which cooperation arises as an equilibrium strategy in intragroup trades for the minority while transactions within the majority and between members of different groups remain non-cooperative. We then discuss how such an outcome may generate a "hostility externality" so that partial cooperation – i.e., cooperation within a subset of the population, may *in fine* prove detrimental for the cooperative group. We conclude with insights on how the hostility externality can be internalized.

JEL Classification: D64, J15, J61.

Key Words: Social interactions, Cooperation, Minorities, Intergroup relations, Social Conflicts, Envy, Hostility.

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1. Introduction

Standard economic analyses of minorities emphasize the costs incurred by minority members, such as discrimination in labor, product and/or credit markets.[1] In fact, in this and the related literature, a minority group is defined by the very fact that it is discriminated against, even if that group is demographically dominant. Economic historians and sociologists, however, present a more balanced picture of the economic fate of minorities. They show that, alongside detrimental occurrences such as property confiscation, discrimination, forced migration, etc., more often than not there are also benefits realized by minority members through the in-group creation of "social capital" that is valuable in both interpersonal relations and in the marketplace (COLEMAN, 1990).[2] For example, it has long been recognized that some minority groups perform relatively well in high transaction costs activities, because of their ability to enforce cooperative behavior in intragroup trades (see e.g. GREIF, 1989, 1993, STARK, 1995, and RAPOPORT, 1999).

In the present paper we link these negative and positive aspects of belonging to a minority, by considering a situation in which the benefits obtained through membership in a minority have the unfortunate side effect of indirectly imposing costs on those same minority members. In so doing, we are interpreting the common wisdom that success by a minority often comes at a price. The central idea links to the issues of envy and hostility, with the latter treated, in our setting, as the behavioral implication of the former. We refer to envy and to hostility in the Rawlsian sense:

> "We may think of envy as the propensity to view with hostility the greater good of others even though their being more fortunate than we are does not detract from our advantages. We envy persons whose situation is superior to ours … and we are willing to deprive them of their greater benefits even if it is necessary to give up something ourselves … [in] hostile acts to which our envy make us prone" (RAWLS, 1971: 532).

More precisely, and to use a further distinction introduced by Rawls, we refer to the "resentment" type of envy rather than to the "rancor" type of envy. The former type is morally justifiable while the latter is not. A rancorous individual is a person who has a distate for the income of others when these are higher than his own income, whatever the circumstances.[3]

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[1] See the Symposium on these issues in the *Journal of Economic Perspectives*, Spring 1998, and the classical contributions by BECKER (1957) and ARROW (1972).

[2] "Like other forms of capital, social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence. … Unlike other forms of capital, social capital inheres in the structure of relations between persons and among persons. It is lodged neither in individuals nor in physical implements of production" (COLEMAN, 1990: 302).

[3] One could also use the concepts of malevolence, meanness, malice, etc. See BRENNAN (1973), who uses the terms "malice" to indicate negative altruism (a distate for the income of others) and "envy" to indicate that the

The resentful individual, on the other hand, is a person who can legitimately feel treated unjustly by the institutions that determine his welfare. This distinction has recently been tested by FALK & FISCHBACHER (2000). In their experiment, they had subjects play two alternative types of ultimatum games. In the first, the proposer had the option of offering one of two divisions of a pie – a 50-50 split or an 80-20 split. In the second, the proposer could only offer an 80-20 split. They demonstrated that receivers were far more likely to accept an inequitable split in the latter game. We interpret this result as an indication that rejections are driven by resentment and not by rancor.

Consider an economy consisting of a given number of intrinsically identical individuals, segmented by group affiliation. Transactions in this economy can be undertaken through a market, in which individuals with similar characteristics perform equally well, and are consequently rewarded equally by society. Because of information problems, however, these markets exhibit significant transaction costs that can be saved through cooperative agreements. If, because of the institutional setting, only a subset of group can attain cooperation, members of the other groups may feel prejudiced, infer that they have been cheated or at least treated unfairly (even if such intentions are totally absent), and therefore feel resentful.

Negative feelings such as these are known to develop in intergroup relations for a wide range of real life situations. These include principal-agent relationships, intercultural bargaining, and, in fact, any situation with incomplete information.[4] This is also testified to by sociological and political studies, which show that ethnic hostility and violence is generally directed against relatively successful minorities (particularly middlemen minorities)[5].

As explained above, resentment can lead to hostile reactions that can range from relatively negligible (and perhaps even imperceptible) actions to severe reactions, such as actual violence and destruction of property. In any case, this hostility has the effect of lowering the value to minority group members of interactions with majority group members. This idea is a natural extension of the issues raised by CARLTON (1995), that considers the issue of conflict and hostility between groups, and introduces the concept of a "hostility

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marginal disutility of anothers' income increases as their income increases. These understandings are borrowed from HAMMOND (1987).

[4] As FRANKE (1995) puts it: "From daily observation it is well known that transactions with people from another background (ethnic, religious, …) generate feelings of uncertainty on both sides due to a lack of information about the other side. … Moreover, if one group feels that it does not get from life what it expects, then an easy excuse for that failure is to accuse the other group of being responsible. The other group is made the scapegoat. Hostility is likely to build up."

[5] On the sociopolitics of ethnic conflicts, see e.g. HOROWITZ (1985), GURR (1993), and BATES (1999), and, on middlemen minorities, BONACICH (1973), COOTER & LANDA (1984), and SAMARASINGHE & COUGHLAN (1991).

externality". In our paper we also consider a hostility externality between groups, but as distinct from Carlton where the externality is generated as a result of negative experiences from contact between groups, we assume that hostility originates from the coincidence of two necessary elements. The first element is that minority members are able to achieve cooperation in their internal dealings, while all other trades (including those carried out in internal dealings within the majority) are conducted non-cooperatively (through the market). The second necessary element is that this translates into a relatively better performance for minority members. Note that we do not address the issue of organized hostility (such as organized expropriations, expulsions, etc.) developed in Carlton, because we assume hostility to take place in interpersonal relations rather than through collective actions. Nevertheless, it is obvious that these two types of hostility can coexist and feed off one another.

In our model, all members of a society, bifurcated into a minority and a majority, transact with other members of society in a series of one-shot prisoners' dilemma games. The matching process is random, so that each member transacts both with members of her own group, and with members of the other group. Transactions can be carried out non-cooperatively through a market mechanism, or cooperatively, saving on transaction costs. Altruism is introduced (and is assumed to be equally distributed across groups) so that cooperation and efficiency at the group level can be sustained without having to rely on repeated interactions. As we all know, however, there are limits to the degree and scope of altruism. For this reason, the scope of altruism will herein be assumed to be limited to one's group. Because of the size of the majority and the existence of a free-rider problem, it is not individually optimal, in our setting, for majority members to cooperate, but minority members may be able to sustain cooperation in their intragroup trades. This could lead to hostility and translate into losses for minority members in their dealings with the majority, with the degree of hostility depending on the size of the income differentials across groups.

Each minority member, however, does not see herself as affecting the overall payoff of the minority as a whole, and thus does not internalize the negative effect of her decisions.[6] Hence, the hostility externality may lead to relatively too much cooperation within the minority, and offset the gains from internal cooperation. This result is similar to that presented in BEAUDRY, CAHUC & KEMPF (2000), who, in a symmetric game, considered the possibility that cooperation within one group decreases the payoffs from intragroup transactions for the

[6] Assuming that hostility reflects concern for social status, this would illustrate what FERSHTMAN & WEISS (1998: 816) noted in the case of immigrants, who "may not internalize their impact on the status of other individuals and on the "status function" which emerges [as a consequence of their presence]".

other group.[7] In our setting, on the contrary, one group (the minority) is sanctioned when it achieves intragroup cooperation *while cooperation is not achieved within the other group* (the majority) because of a different incentive structure, and the externality is imposed in intergroup transactions. In both cases, however, both groups may well end up worse off than if there were no cooperation at all in the economy.

2. The model

We are interested in showing how a minority group is affected by potential hostility by a majority. To this end, we consider a population of fixed size bifurcated into two groups: N members of a majority and M members of a minority. The proportion of the minority in the population is $\pi_M = M/(M+N)$. By definition, $M<N$.

All individuals engage in an identical number of economic transactions per period. Each individual is randomly matched with other players for each transaction, so that a proportion π_i of the transactions consummated by an individual belonging to group i, $i=M,N$ are carried out within the group to which she belongs. Exchanges take place without recognition costs, i.e., when a transaction is entered into, the individual immediately knows the group affiliation of her trading partner. Each transaction can be carried out through a market mechanism, denoted a non-cooperative interaction, or via a cooperative agreement between the sides. The feasible outcomes portray a non-cooperative one-shot Prisoner's Dilemma game. The payoff matrix for the row player is as presented in Table 1, with $A>B>C>D$ and $2B>A+D$. B is the cooperative, non-market based result, and C is the payoff from interacting via the market.

Table 1: The payoff to the row player for each transaction

	Cooperation	No Cooperation
Cooperation	B	D
No Cooperation	A	C

Without loss of generality, we assume that $D = 0$, and, temporarily, that $C = 1$. A is the gain an individual receives by deviating from a cooperative agreement. This is an increasing

[7] Convincing examples being collective wage bargaining at the industry level instead of at a more centralized level, or arms races.

function of the size of the *relevant* group (the size of the group as viewed by the individual for *that specific transaction*, as detailed below). This is due to the alleviation of social sanctions when agents get more anonymous, or, in other words, to the increasing incentives to free ride in larger groups. For simplicity, we assume that the ability to free ride depends on the *relative* size of the group in question, so that, for instance the size of the minority is measured by π_M instead of by *M*.

We now make the following assumption:

Assumption 1: *When an individual in group i, i=M,N, transacts with an individual in the same group, she views the size of the relevant group as* π_i *, but when she deals with someone from the other group, she views the size of the relevant group as the entire population.*

This assumption highlights the fact that only when dealing with someone from the same group is free riding relatively costly (i.e., the payoff from defecting is relatively low), while the cost of free riding is brought to a minimum when dealing with someone from another group.

With these understandings, we conclude that the payoff *A* is expressed as a function of the relative size of the relevant group. Assuming a linear form, $A_{ij} = B(1+\pi_{ij}), i, j=M,N$, where $\pi_{ij} \equiv \pi_i$ for intragroup transactions, and $\pi_{ij} = 1$ for intergroup transactions. Table 1 can now be rewritten as follows:

Table 2: The payoff matrix for the row player

	C	NC
C	B	0
NC	$B(1+\pi_{ij})$	1

Agents are assumed to be altruistic towards people in their group. More precisely, the individual's utility when dealing with a member of his group is a weighted average of the monetary payoffs of both trading partners, with a weight of $(1-\alpha)$ placed on her own payment, and a weight of α placed on the payment to the other party. As a result of this specification, the payoff table needs to be modified only for intragroup transactions and only

in those cells in which players play different actions, i.e., in the off-diagonal cells. We make the ancillary assumption that α<1/3 for analytical convenience (and because it is quite realistic), since, as a result, we rule out the possibility of intragroup cooperation within the majority (as distinct from RAPOPORT & WEISS, 2000).

We now present the two payoff matrices for intragroup and intergroup transactions as follows:

Table 3a: The intragroup payoff matrix for the row player with altruism

	C	NC
C	B	$\alpha B(1+\pi_i)$
NC	$(1-\alpha)B(1+\pi_i)$	1

Table 3b: The intergroup payoff matrix for the row player with altruism

	C	NC
C	B	0
NC	2B	1

Note in Table 3a that since the majority comprises at least 50 percent of the population and α<1/3, cooperation cannot be an equilibrium.[8] In addition, note from Table 3b that for intergroup transactions, cooperation is also not attainable. Hence, we are left with only the minority group in which there may be cooperation under some circumstances.

Finally, we include the hostility externality, as presented in the introduction. The externality shows up as a lessening of the payoff received through a market intergroup transaction, and is expressed through the function $h(\pi_i, B)$, $i = M, N$, with $h'_{\pi_i} > 0$, $h''_{\pi_i} > 0$, $h'_B > 0$, $h''_B > 0$, and $h(0, B) = h(\pi_i, 1) = 0$. This function expresses the idea that an increase in the size of the cooperating group or in the benefits its members receive through cooperative agreements leads to a more than proportional increase in the amount of hostility towards that group. The assumption that $h(\pi_i, 1) = 0$ says that in the absence of any *gain* for the minority (B=1), there is no hostility externality, even if there is cooperation. This again highlights the fact that we are discussing hostility caused by the minority's relative success through cooperative efforts, rather than hostility caused by differences in labor market attributes or by non-economic factors.

[8] Since $(1-\alpha)B(1+\pi) > B \quad \forall(\alpha < 1/3) \cap (\pi > 1/2)$.

As discussed in the introduction, we consider only the "resentment" type of envy and not the "rancor" type of envy, which leads to the following assumption:

Assumption 2: *A group's members are envious of the other group's members if and only if the other group cooperates, while the group to which the member belongs does not.*

For this to hold true, the hostility externality must kick-in only when one group cooperates and the other does not. We thus define a dummy variable d_{ij} that equals unity when group *j* cooperates but group *i* does not, and zero otherwise. We thus arrive at the final matrix, which refers to intergroup transactions. Note that due to the presence of the hostility externality, the payoffs are no longer symmetric, so we present the entire matrix:

Table 3c: The intergroup payoff matrix in the presence of potential hostility

	C	NC
C	B,B	0,2B
NC	2B,0	$1\text{-}d_{ij}h(\pi_i, B), U_j^{\max}$

The payoff to the group potentially inflicting the hostility on the other group in the event of a non-cooperative outcome, $U_j^{\max}$, depends on whether, indeed, hostility is inflicted. If there is no hostility, this equals one, since this was the normalized return for a market interaction in the absence of hostility. If, however, there is hostility, the market payoff for the majority member will result from maximization of her utility function, which will now include envy as a parameter. The exact value of this payoff is immaterial from our perspective, since our goal in this paper is to analyze the choices of the minority. Note, however, that compared to a situation in which there is no hostility there are two opposing effects. On the one hand, the cooperation within the other group has lowered her utility, and hence sparked a reaction. On the other hand, the damage she has imposed on the other party has increased her utility (for if not, she would not have imposed it). For our purposes, we simply need $U_j^{\max}$ to remain positive, in order to retain the PD structure of the game. This assumption is not restrictive, as she can always choose not to interact with the other player.

We add the assumption that $h(\pi_i, B) < 1 \; \forall \pi_i, B$, so that the market payoff for minority members cannot be negative. Again, this is not a restrictive assumption, since all transactions are voluntary, so the party upon whom the hostility is inflicted will choose not to interact if this condition does not hold. As can be seen from the table, cooperation cannot be attained, and the equilibrium payoff from intergroup transactions for the members of the group upon whom the hostility is being inflicted will be given by $1 - d_{ij} h(\pi_i, B)$.

Recall that we assumed that $\alpha < 1/3$, so there is never cooperation within the majority. We now address the possibility of cooperation within the minority. We assume that when the Pareto superior cooperative outcome is also a Nash equilibrium, cooperation is chosen.[9] In addition, because of the free-rider effect, no individual minority member takes into account the effect of her cooperation in intragroup transactions on the hostility externality. Thus, cooperation will be observed within the minority (see Table 3a) if the payoff when cooperating is higher than the payoff when defecting, i.e. if $B > (1-\alpha)B(1+\pi_M)$. A sufficient condition for cooperation to be a possible (but not unique) equilibrium in transactions within the minority is therefore:

$$\alpha > \frac{\pi_M}{1+\pi_M} \equiv \alpha_M^{\min}. \tag{1}$$

From here it is easy to see that the altruistic threshold required for cooperation to prevail in intragroup transactions is an (less than proportionally) increasing function of the relative size of that group.

Assuming the level of altruism is sufficient to lead to cooperation within the minority, we now examine the effect on income. A minority member's income is a weighted average of the income from cooperative intragroup trades (B from Table 3a) and the income from non-cooperative intergroup trades ($1 - h(\pi, B)$ from Table 3c). The average income thus equals

$$\bar{I} = \pi_M B + (1-\pi_M)\left(1 - h\left(\pi_M, B\right)\right).^{10} \tag{2}$$

Figure 1 illustrates how this average income changes with an increase in the minority size, the exact shape of the curve depending on the hostility function chosen and on the value of B. In any case, the conditions on h guarantee that $\partial \bar{I} / \partial \pi_M > 0$ when $\pi_M \to 0$.

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[9] For sufficiently high levels of altruism, interactions no longer exhibit a Prisoners' Dilemma structure. The possibility of multiple equilibria is ignored; we simply assume the existence of coordination procedures if necessary.

[10] Note that the dummy variable no longer appears since it equals 1 when the minority does not cooperate and the majority does.

[Figure 1 about here]

When the minority size increases, two critical thresholds are identified. The first threshold, denoted $\hat{\pi}_M$, is the minority size for which income per member is maximal. A second threshold, denoted $\tilde{\pi}_M$, is the minority size for which income per member is equal to unity, i.e. the income earned by majority members, and the income attainable without intragroup cooperation. This gives rise to three possible situations. First, if $1/2 < \hat{\pi}_M$, income in the relevant range rises monotonically with size. Second, if $\hat{\pi}_M < 1/2 < \tilde{\pi}_M$, income in the relevant range rises until $\hat{\pi}_M$ and then falls, but it is always greater than unity. Finally, if $\tilde{\pi}_M < 1/2$, the income earned by minority members in the relevant range rises until $\hat{\pi}_M$, then decreases and becomes lower than unity for a sufficiently large group size (when $\pi_M > \tilde{\pi}_M$).

These three possibilities are combined in Figure 2 with the constraint presented in Equation (1). If the economy is above this constrain there is cooperation within the minority, and if it is below the constraint (area A in each of the figures), there is no cooperation, and, hence, no hostility. The bold line shows the minority size for which income per capita within the minority (Equation 2) is maximized when the externality is taken into consideration. In Figure 2(a), corresponding to the case where $1/2 < \hat{\pi}_M$, income is maximized when the minority is as large as possible while still attaining cooperation. On the contrary, while in Figures 2(b), (corresponding to the case where $\hat{\pi}_M < 1/2 < \tilde{\pi}_M$), and 2(c), (where $\tilde{\pi}_M < 1/2$), cooperation can be attained even if the group is larger than its optimal size. Indeed, it is interesting to note that in Figure 2(c) there is an area (D) in which the minority members earn less than if they were to not cooperate, yet cooperation endures because the externality has not been internalized.

[Figure 2 about here]

For each of the possibilities we analyze the equilibrium that will be attained if people can costlessly change group affiliation (and the externality has not been internalized).[11] In area B of Figure 2(a), and in areas B and C of Figure 2(b) minority members earn more than do majority members, even with hostility. If group affiliation can be changed, we can expect

[11] While with ethnic groups changes in affiliation may not be possible, with other groups (including religious groups) such changes may be feasible.

to see movement from the majority into the minority. This will continue until the border between the areas is crossed, at which point cooperation (and hostility) ceases to exist within the minority. Thus, intragroup cooperation is not stable in this setting. Interestingly, in Figure 2(a) and the lower part of 2(b), the group size that maximizes per member income and the group size that results from a free flow of members are nearly identical. Nevertheless, the results are quite diverse, as optimality requires remaining to the left of the constraint, where cooperation is maintained, while the "invisible hand" will move us ε beyond that point, and dissolve cooperation.

Figure 2(c), presents another possibility. Along the border between areas C and D the income with cooperation and without cooperation are identical. This is because of the hostility externality, which lowers the payoff from intergroup transactions. Thus, in the area above the constraint, the border between areas C and D represents a stable equilibrium with no individual desiring to change affiliation, and this despite the fact that the minority cooperates while the majority does not. It is clear, however, that this stable minority size is greater than optimal for the minority members.

3. Conclusion

In this paper, we investigate the incentives for members of a minority to deal cooperatively with other minority members, when doing so increases the returns from these dealings, but concurrently leads to hostility from the majority. In our model, the population is bifurcated into a majority and a minority. Each individual plays a series of one-shot prisoners' dilemmas, with random matching. We assume that individuals have locally altruistic preferences (the scope of altruism is limited to one's group), and that individuals face increased incentives to defect from cooperative agreements in larger groups. As a result, cooperation is never achieved in intergroup trades, while there are instances in which the minority alone cooperates in its intragroup trades. Such cooperation leads to higher payoffs for minority than majority members. The presence of such higher payoffs coupled with the fact that minority members attained cooperation while majority members did not, leads to envy on the part of majority members. As a result the majority develops hostility towards the minority, and consequently, these same minority members then sustain losses during intergroup trades. We then discuss the size of the minority, and show that if people are free to costlessly change group affiliation, any gains from cooperation within the minority will be wiped out in the long-run.

One of the most significant conclusions we derive is that since no single minority member takes the hostility externality into account, there are instances in which there is too much intragroup cooperation. Furthermore, we demonstrate that there are many instances in which it would be beneficial for minority members to limit the size of the minority. A first step towards internalizing the hostility externality would be to make joining less attractive, or even to encourage the assimilation of a fraction of its members. Alternatively, minority members, individually or collectively, could attempt to mask their affiliation. In any case, there is a clear incentive for the minority as a group to actually control entry and exit, so that group size can be endogenized (IANNACCONE, 1992), or to manipulate the degree of intragroup altruism through collective socialization (GUTTMAN, NITZAN & SPIEGEL, 1992). Without such steps, it is likely that in the presence of a hostility externality, partial cooperation, i.e. cooperation within a subset of the population, may well make the cooperative group worse off.

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Figure 1

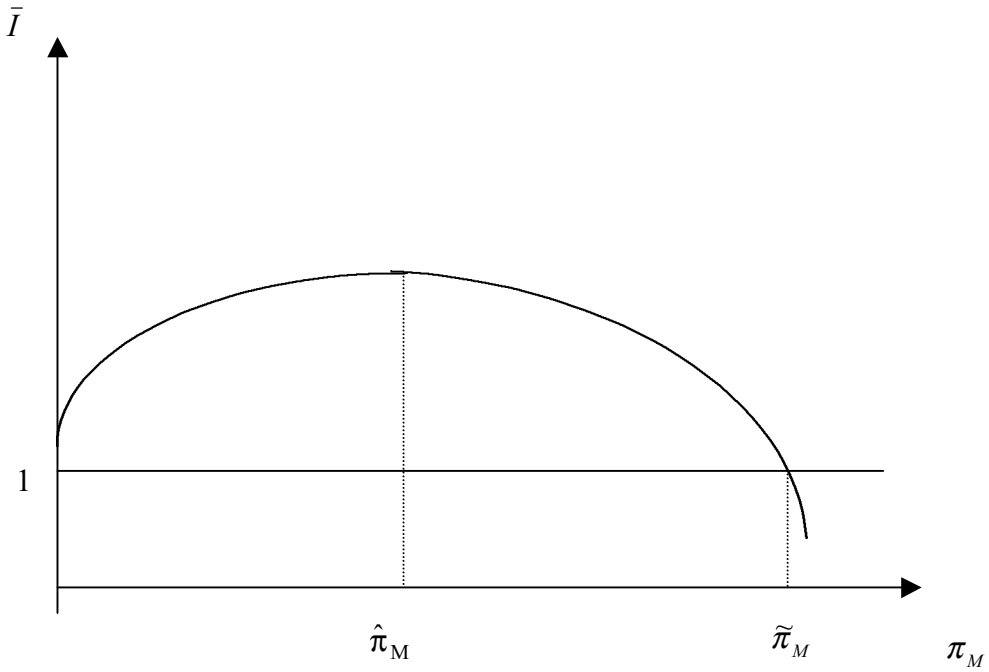
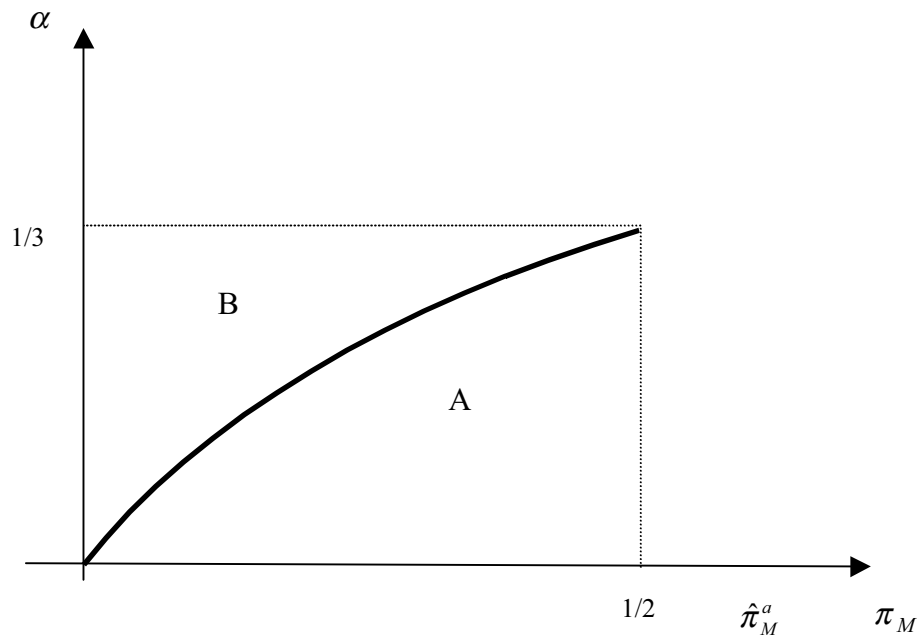
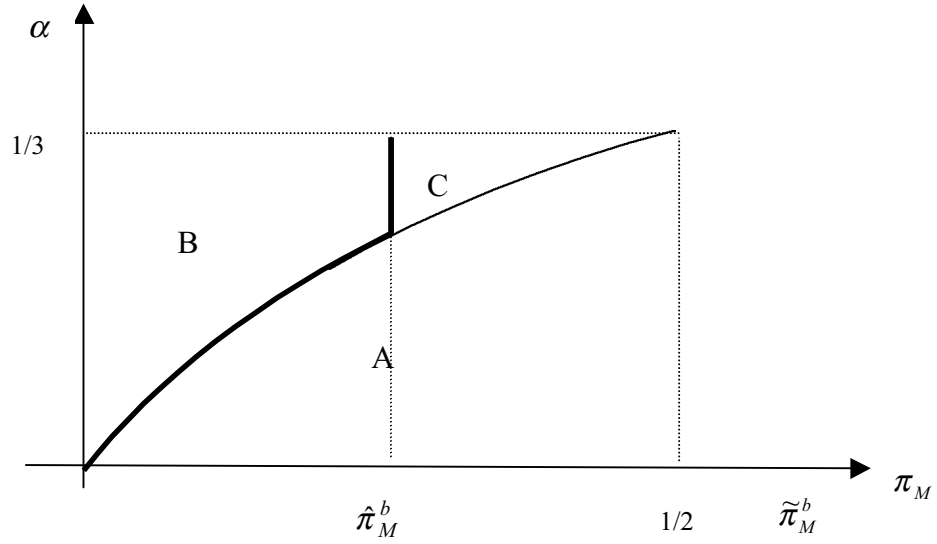


Figure 2

Case (a)



Case (b)



Case (c)