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REDISTRIBUTIVE POLICIES, SOCIAL INTEGRATION AND PRODUCTIVITY: AN EXPLORATION

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1. Introduction.

The economic conditions of the poor segments of a population can be improved through government transfers or through increases in the market income of the individuals in the relevant groups. Both effects may interact. A common argument, found both in informal discussions and in the recent literature on economic development, is that the level of individual productivity depends on that of the community where the agent lives and performs activities. It would follow that "social integration", in the sense of dense contacts between people with different labor incomes, tends to create positive externalities for the relatively poor. Some of these externalities could be attributed to informal learning, either in the workplace or in the place of residence; in addition, a certain homogeneity in behavior patterns (which can be expected to associate with less "segregated" neighborhoods) is likely to reduce transaction costs overall. If these effects are present, redistributive policies which modify the spatial composition of the population --or otherwise change the strength of the interaction between groups--may influence the productivity of the target sectors, and their ability to escape "poverty traps".

The connection between distributional policies and locational mobility appears in the literature in several contexts. One of these is that of the analysis of fiscal federalism (cf. Oates (1972),(1977), Brown and Oates (1987), Wildasin (1992)). For example, in a system where the responsibility for redistributive interventions is decentralized, a decision to tax the rich in a given community in order to provide more and better-quality services to the poor will attract more poor individuals from neighboring areas --the well-discussed migration selectivity problem (see Rosenzweig and Wolpin (1988))-- and, at the same time, will induce a displacement of the rich to other communities where they can enjoy more benefits from their tax contributions. As a consequence, the attempt by local authorities to redistribute income may generate population stratification as people segregate

themselves into poor and rich areas. This result can be also derived if policy is chosen endogenously through a majority voting scheme (see Epple and Romer (1991)) and Fernandez and Rogerson (1993)). The link between the revenue side of redistributive schemes and the heterogeneity of the composition of different localities would not appear if taxes were determined centrally (that is, irrespectively of the place of residence of the individual) and the authorities use the proceeds to finance transfers to the poor throughout the economy (See Oates and Brown (1987))[1].

However, the configuration of different neighborhoods --and the productivity of the persons inhabiting them--can also vary with the way in which public resources are spent. In this paper we focus on such possibility, disregarding the effects of the funding mechanism of social programs. In any case, underlying the particular exercise we develop below, the theme that we intend to highlight is that the interaction between social groups (which, among other factors, depends on government policies) may influence economic productivity, and therefore the degree of income inequality[2].

In its simplest form, the model we develop describes in a static setting an economy with two regions of similar size where the population is divided into two groups, R (rich) and P (poor), differentiated according to their (inherited) level of marketable human capital (skills). The wages (productivity) of low-skill agents is assumed to depend not only on individual variables, but also on the average productivity of the region where they live. This externality, which appears prominently in recent models of

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[1]Horizontal transfers can constitute an alternative to central revenue-raising. Such transfers represent payments that relatively rich regions deliver in a direct way (i.e without going through a central government) to areas with lower income. See Hercowitz and Pines (1991) for a model where it is shown that rich regions may gain by doing so.

[2]For a related analysis see Benabou (1991). Population stratification and the emergence of income inequalities have seen also studied in a dynamic setting by Durlauf (1992).

endogenous growth (see, for example, Lucas (1988)), makes the marketable skills of agents in group P a function of the characteristics of their area of residence[3]. People can move from one community to the other, although migration is costly. When deciding where to localize themselves, households try to maximize their total income (consumption). The (central) government gets into the picture through lump-sum transfers to the poor financed with lump-sum taxes imposed equally on the rich living in both jurisdictions.

We assume that the implementation of these transfers is associated with an administrative cost which has a fixed component. Consequently, the implementation cost, in per poor-individual terms, is lower in the jurisdiction where there are more poor people. The fixed cost can incorporate the resources used in applying the "eligibility" and "control" devises that a targeting scheme to help the poor should have in order to concentrate the benefits of the programs on the desired groups[4]. These administrative costs introduce an scale effect by which, if each region receives gross transfers in proportion to the number of P agents, per capita transfers to the poor -net of implementation disbursements-- are higher in the community where more poor people are localized.

In the model, the migration decision of the poor is determined by two forces which act in opposite directions. First, the externality effect makes poor individuals willing to integrate themselves in

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[3]As a simplification, we assume that wages of the type-R individuals are given, independently of their location. More generally, in this paper we concentrate on their choice of place of residence. Clearly, in practice, the attitudes of the rich can influence strongly the degree of "social cohesion" in a given community. In this regard, our argument does not pretend to describe the problem in all its aspects.

[4]The trade-off between administrative cost and targeting accuracy is discussed in Grosh (1992). Case-studies of regional targeting can be found in Ravallion (1992) and in Datt and Ravallion (1991). See Lipton and Ravalion (1993) for a recent survey on poverty alleviation policies.

communities where the average level of aggregate income is higher. But, second, if public transfers are effectively larger in poor communities, low income families have an incentive to segregate themselves in poor neighborhoods. If the scale factor of public transfers is big enough and the level of public assistance per poor individual is determined in "gross" terms, government actions aimed at reducing poverty could result in more population stratification, so that poor people living in poor areas become increasingly dependent on transfers. In some circumstances, it is even conceivable that a shift from less to more "targeted" social policies may reduce the welfare of all the poor, if those remaining in the high income region suffer big enough cuts in the transfers directed to them, and in the poor area the negative productivity effect due to incoming migration more than offsets the increase in public subsidies. Although this case is probably too extreme to be of practical relevance, it dramatizes the not-so-simple links between policies and productivity through "integration" or segregation effects.

The results mentioned above are derived in a context of a static model, where there is no room for factor accumulation, and transfers from the government, although possibly made in kind, are modeled as increasing disposable income (rising consumption). However, public spending in education and health also have of course an element of investment in human capital, that will end up having a positive effect on the individual productivity of those agents who are given access to such services. In that case, poor people may escape the "poverty trap" by the rise in productivity induced the accumulation of human capital, itself facilitated by government transfers.

The analysis of the following section can be re-interpreted, with slight changes, by assuming that social programs take the form of lump-sum human capital- augmenting expenditures (which raise the level of market incomes in the current period) and that individuals make a single lifetime location decision. In this setting, the attention is drawn again to the interaction between the allocation

of spending and the externalities on productivity: if, for example, only the poorest areas receive public assistance for education, it may happen that low-income individuals are induced to concentrate themselves in those regions, and that in a less diverse environment the effects of the program would generate much less benefits than expected. While this is clearly not a generic argument against focusing spending on well chosen target groups, it may serve to point out that helping people to rise "by themselves" above the poverty line involves contributing to provide a "social climate" that will enhance their ability to function in the economy.

In its simplified way, the discussion sketched here relates to the literature dealing on the connections between growth and distribution. Such studies (which not always focus on the analysis of the impact of alternative policies) differ in their conclusions. For example, Tamura (1992) suggests that growth in human capital and output assures a convergence of individual incomes, so that income inequality and poverty both diminish with growth. Glomm and Raikumar (1992) obtain a similar result, even if they indicate that in order to reduce inequality more rapidly the government should promote investment in human capital. By contrast, Benabou (1993) and Durlauf (1992) have built models where economic growth could be associated with increasing income inequality and population stratification. In the exercise discussed here, poverty reduction does not appear to be an "automatic" consequence of growth.

2. Public transfers and the productivity of the poor

2.1 A simple setup

The analysis of this section is based on a simple static model, where the population is assumed to be divided into two groups: R (rich) and P (poor), and occupies two localities (cities), 1 and 2. We simplify the preference structure by assuming that agents have linear utility functions depending on a composite consumption good. In a static setting, this reduces individuals' incentives to the

maximization of income, their choice variable being the place of residence.

The production side of the model is also simplified. We assume a one-factor production function where quality-adjusted labor determines output. The "intrinsic" stock of human capital is given for each group of individuals, being greater in the case of type-R individuals. The income of the R-types depends only on their stock of human capital and does not vary with their localization: we postulate that the regional distribution of R-agents is parametric[5]. In the case of individuals of the P-type, their productivity (income) is defined by their fixed level of human capital, and also by an externality effect, which depends on the average productivity (income) of the locality where they choose to live. This last effect tries to capture the notion that the productivity of agents, especially those with less "formal" skills, is influenced by their "local" interactions with other people, so that their market incomes may vary widely according to the environment in which they perform their activities.

2.2 Equilibrium with migration and no transfers.

While the income of type-R individuals is (by construction) a fixed amount w^R, that of P-types is given by,

$$w^P{}_j = w^P + F(w^A) \quad ; \quad w^A = \frac{(w_j{}^P P_j + w^R R_j)}{P_j + R_j} \qquad (1)$$

where wj^P is type-P income in region j, w^P is the exogenous component (determined by the "own" human capital), $w^A{}_j$ indicates the average productivity in region j and F(.) is a function describing the externality effect. The function F is defined in such a way that $F'(.)>0$, $F''(.)<0$ and $w^P{}_j < w(R)$ for any distribution of the population. The assumption that $F''(.)<0$

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[5]If R-agents were to be allowed an active role, we conjecture that the main results would not change much, and are likely to be reinforced.

captures the notion that the externality effect implies "decreasing marginal returns" to social integration. Given that w^R and R_j are fixed constants (because of the assumption that R-agents do not migrate) expression (1) defines an implicit function where the income of the poor in region j depends on the number of poor people living that area. It is easy to show that if $w_j^P < w^R$ then,

$$\frac{\partial w_j^P}{\partial R_j} \geq 0 \quad ; \quad \frac{\partial w_j^P}{\partial P_j} \leq 0 \quad (2)$$

Moreover, we assume that F(.) determines an explicit relationship between w_j^P and P_j of the following general form,

$$W_j(P_j) = G(P_j) \quad where \; G'(.) \leq 0, G''(.) \leq 0 \quad (3)$$

Clearly, P-agents would have an incentive to move to the location where they are relatively less numerous, because of the higher market wages in that locality. However, migration between localities (we postulate), entails a fixed cost, c (which is irrelevant for the R-group but not for P-type individuals). For a given distribution of the R-individuals, several non-government-intervention equilibria may emerge depending of the initial distribution of the P-type households. These equilibria will be characterized by a population distribution between localities 1 and 2, (P_{1*}, R_1) (P_{2*}, R_2), for which the following condition holds:

$$|w_1(P_1^*) - w_2(P_2^*)| \leq c \quad (4)$$

Figure 1 illustrates the different equilibria that can be found, assuming a smooth shape for the w(.) functions.

If $R_1=R_2$, and we normalize $P=P_1+P_2=1$, it is clear that the curves $w_1(P_1)$ and $w_2(P_2)$ intersect at $P_1=0.5$. Furthermore, if in the initial situation the population of P-agents was very

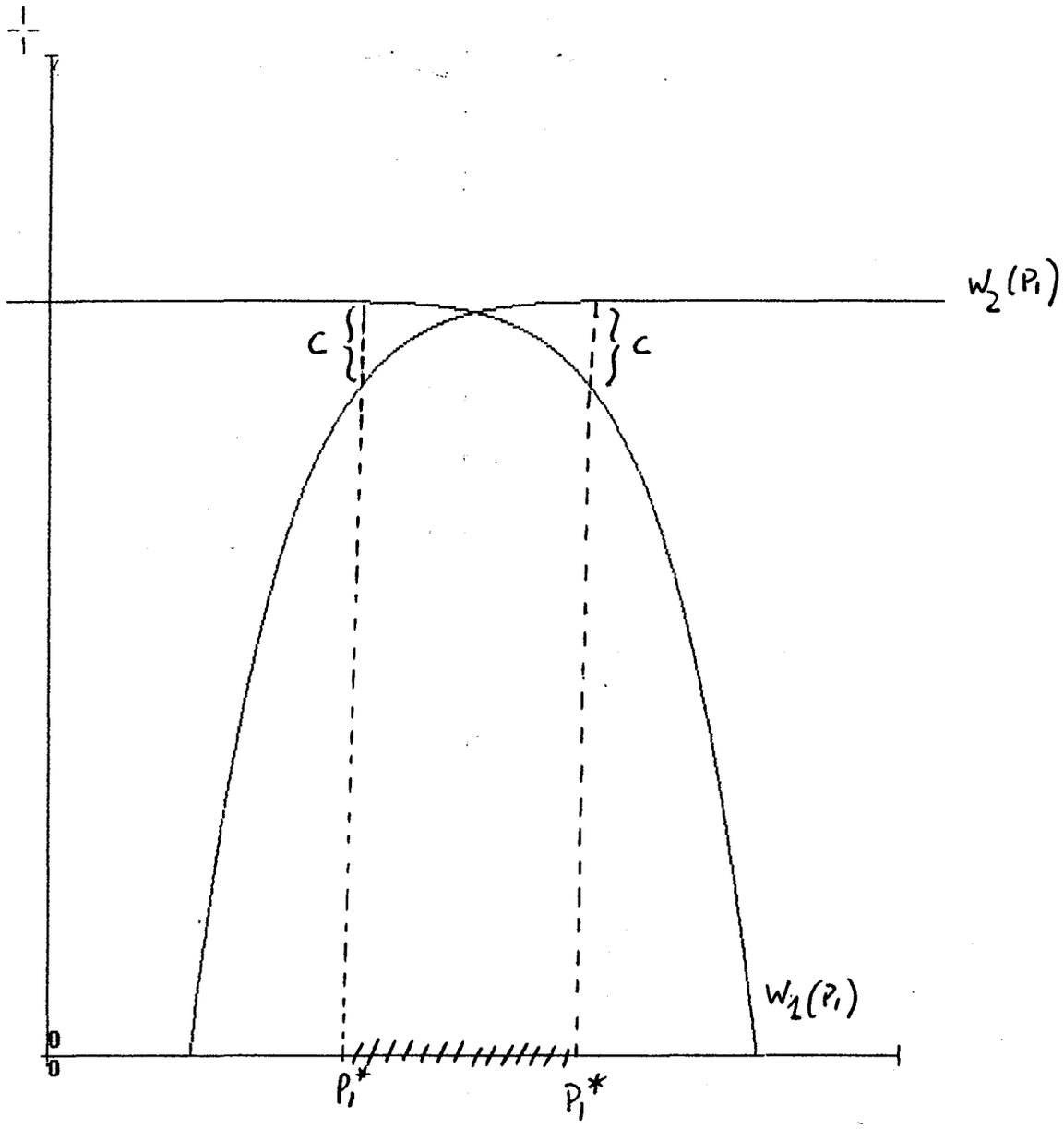

Figure 1

asymmetrically distributed (e.g. poor people started very concentrated in region 1), migration from locality 1 to 2 would imply an equilibrium at $P_1=P_1^*$, where P1*>0.5. In this equilibrium, equation (4) is satisfied as an equality. In what follows, we will assume that the starting distribution of P-agents is of this kind.

2.3 Public transfers.

Social policy takes the form of lump-sum transfers to the poor financed with lump-sum taxes charged (at equal per capita levels) on the R-type individuals in both jurisdictions[6]. Since the emphasis here is on the analysis of alternative ways of defining the transfers to P-individuals, we do not endogenize the volume of resources devoted to "social programs": by assumption, the budget allocated to those purposes is given. We postulate that, in each jurisdiction, the implementation of the transfer program implies a fixed cost of size k, the same in both localities (given that we normalize total P-type population to one, k can also be interpreted as the implementation cost in per-poor terms).

"Equal net transfer scheme"

In this setting, the government delivers to all P-agents, irrespectively of their location, an equal net transfer (i.e. after allowing for the per-capita costs of running the program in each locality). In "gross" terms, of course, the locality where P-individuals are relatively less represented receives a higher per-poor allocation. If θ s the size of the net transfer, the total budget of the program will be:

$$B=\theta+2k \quad (5)$$

It is obvious that this policy does not modify the choice of location with respect to the no-transfer scenario. Therefore, the

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[6]This last property characterizes the redistributive policy as centrally managed from the point of view of its funding.

population equilibrium shown in figure 1 will not be disturbed. That is, (P_1*, P_2*) will still be the equilibrium distribution of P-type households between both localities (the $w_j(P_j)$ curves will be displaced by an equal distance so that the productivity differential evaluated at $P_1=P_1$* remains equal to c).

Shifting to an "equal gross transfer" scheme

Suppose now that the transfer program is re-designed in such a way that now the central government seeks to equalize transfers in gross terms in both regions, spending the same total amount of funds as before. Each locality is treated "symmetrically", in the sense that each receives a volume of resources proportional to the number of poor living in it; however, there is no compensation for the assumed "diseconomies of scale" in running the program in the areas which are less dense in P-agents. keeping constant the total budget, the net transfer per poor in region j is now set at:

$$x_j=(\theta+2k)-\frac{k}{P_j} \quad (6)$$

and the total income of the representative P-type individual living in region j is,

$$v_j(P_j)=w(P_j)+\theta+2k-\frac{k}{P_j} \quad (7)$$

Since k (the implementation cost per-poor individual) is fixed, the shift to a system of "equal-gross transfers" increases the net transfer received by each P agent in region 1, where poor people are more concentrated ($P_1>1/2$), and reduces the per capita net transfer in region 2. This may or may not modify the distribution of P-type agents between localities, depending on the size of the change in after-transfer incomes in both jurisdictions. Clearly, the shift in policies makes region 1 relatively more attractive: if the transfers are large enough and the scale effect

in running the program is sufficiently strong, the gains in transfer income in locality 1, and the losses in area 2, can be such as to offset the differential in market wages by more than the migration costs. In this case, the policy would induce "reverse migration": P-agents move to the area where they are more concentrated --and their productivity is lower -- because they expect to receive larger transfers. Then, a new population equilibrium would be obtained if:

$$v_1(P_1^*) - v_2(P_2^*) > c \qquad (8)$$

Using the definitions of total income (equation (7)) and recalling that the initial wage differential (in favor of region 2) was assumed to be equal to the migration cost (i.e. equation (4) holds as an equality), this is equivalent to:

$$k\left(\frac{1}{P_2^*} - \frac{1}{P_1^*}\right) > 2c \qquad (9)$$

Intuitively, if the fixed implementation costs are high, and the initial distribution of the poor population is biased, on impact, the policy shift would make P-agents in region 1 significantly better off and reduce substantially the income of P-individuals in the relatively affluent region 2; thus, the latter would be induced to move out of this area, making the poor more concentrated in region 1. Figure 2 illustrates this possibility, assuming that in the new equilibrium some P-agents remain in 2[7].

If there is to be migration from region 2 to region 1, the effect of the switch in transfer policies must be sufficiently large to reverse the total-income differential between the two localities: now, the P-agents living in 1 are better off than those

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[7]That is, the change in policies does not lead to a corner solution. An additional assumption implicit in the argument is that at the new equilibrium net transfers in region 2 are still positive, i.e. the aggregate level of gross transfers allocated to this area exceed the fixed implementation cost.

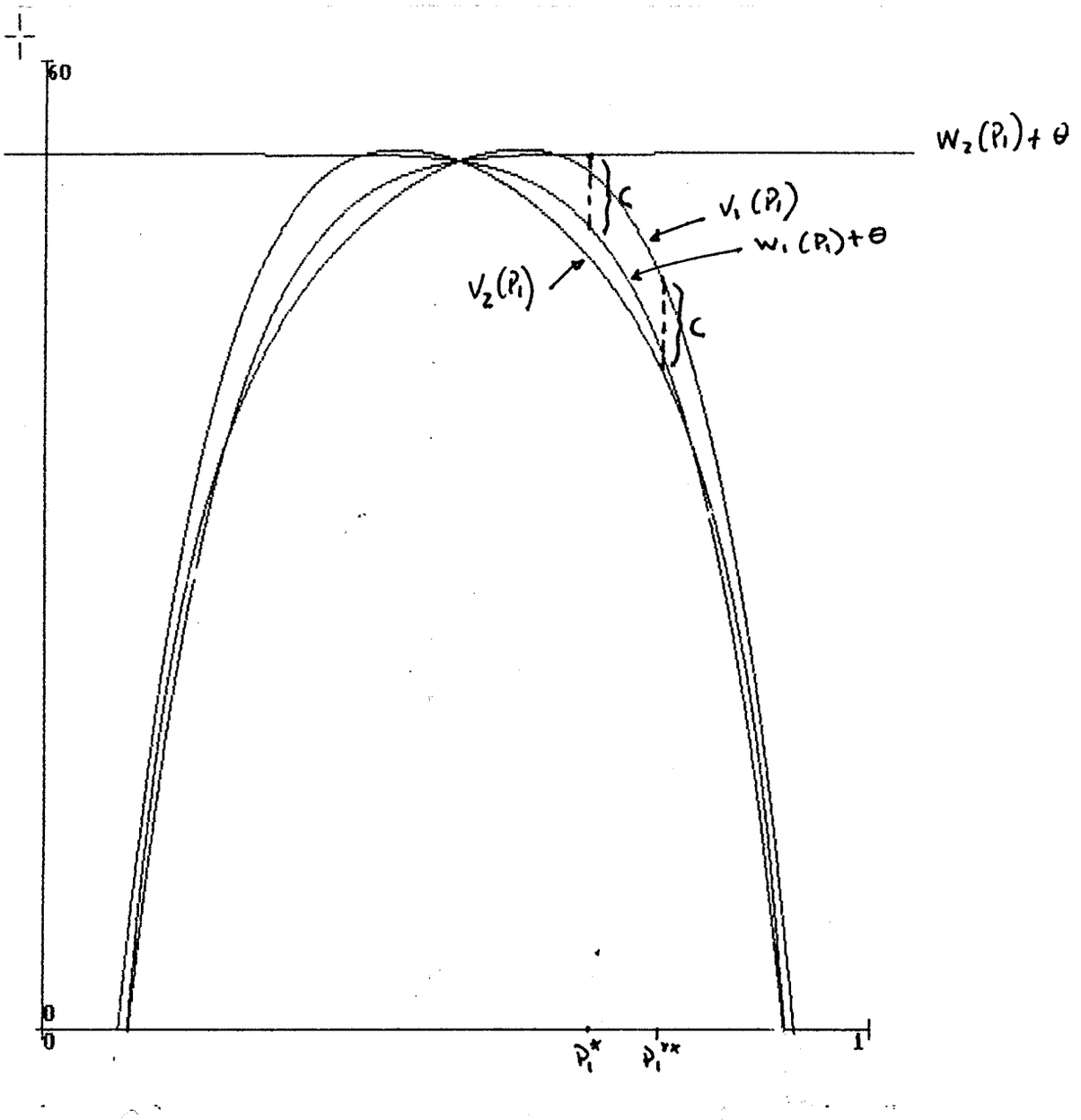

Figure 2

remaining in 2. But, at the same time, the new transfer scheme induces a fall in market incomes in region 1 (due to the externality effect of migration) and, if anything, raises them in 2; that is, it increases the gap in "earned wages" in favor of region 2[8]. In other words, productivity differentials --in the same direction as before-- are amplified rather than reduced. This can be expected to cause a fall in the total income of the P-agents throughout the economy (given that the total level of transfers has remained fixed). A sufficient (but not necessary) condition for this to happen is that market wages in region 1 fall significantly when more P-individuals migrate to the area, while wages in 2 are not much affected by outgoing migration. The condition is likely to hold if "social integration" has decreasing marginal returns as assumed.

Changing from a scheme with equal net transfers to one with equal gross transfers may be interpreted as a move tending to "decentralize" the management of programs (each region receives the same per-poor amount of funds and administers them according to its own "efficiency" in implementing the transfers), and it has an element of targeting towards the area where more poor people are located. Such move could be expected in principle to raise the welfare of the P-agents living in region 1, maybe at the expense of those located in 2. However, it is possible that all P-agents are made worse off by the move.

The intuition behind this seemingly surprising proposition is as follows. The policy change lowers the income of P-agents in region 2, who see the transfers they receive diminished by the adverse scale effect. If this is strong enough, some agents in this region will choose to move out. Migration stops when the total income differential in favor of region 1 equals the displacement cost, c. Now, assume that market wages in area 2 do not increase

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[8]Clearly, this does not hold if the transfers are interpreted as expenditures which operate directly on the levels of human capital.

much when P-agents leave the region. Then, in the new equilibrium, total income per poor in region 2 must be lower than before. The migrants to region 1 have two opposite effects on income per poor in that area: by increasing P_1, they "dilute" the fixed cost of government transfers, but they also reduce the average level of market wages. If the externality effect becomes stronger at high levels of P1, the total income per poor in that region will eventually fall with an increasing population of P-individuals . Thus, if the policy shift induces a relatively large re-location, income in region 1 can decline. This situation is depicted in figure 2.

Somewhat more formally, recalling equations (7), the difference between the region 1 income per poor in the two policy scenarios can be expressed as:

$$\Delta v_1 = w(P_1^{**}) + 2k - \frac{k}{P_1^{**}} + \theta - [W(P_1^{*}) + \theta] \quad (10)$$

where P_1^{*} and P_1^{**} indicate respectively the original and the new populations of P-agents in region 1.

Now, if there is migration, the incomes in the two regions in the new equilibrium are related by:

$$w(P_1^{**}) + 2k - \frac{k}{P_1^{**}} + \theta = w(P_2^{**}) + 2k - \frac{k}{P_2^{**}} + \theta + c \quad (11)$$

This implies, using expression (6) as an equality:

$$\Delta v_1 = w(P_2^{**}) - W(P_2^{*}) + 2k - \frac{k}{P_2^{**}} + 2c \quad (12)$$

If market wages in 2 vary little with a decrease in the number of P-agents in the area, the condition for $\Delta v_1 < 0$ is that the fixed cost k be large compared with the migration cost c (given that

$P_2^{**} < P_2^{*} < 1/2$). Now, large implementation costs were a condition to induce migration (see equation (9)). Therefore, when people are made to move to region 1, it is also likely that after-transfer incomes will fall there, even if the region is apparently favored by the change in policies.

2.3 Regional Targeting

Another policy option which a government may consider is a shift to a regional targeting scheme. In this case, the transfers are applied in the region where the majority of poor people are living, and where they are more densely represented (region 1 in our example), leaving the poor in region 2 without assistance. The justification for such a move may be based on the observation that the costs of providing assistance in area 2 are too high considering the size of the transfers that effectively reach the P-agents there. Moreover, in the initial situation of equal net transfers, the incomes of P-individuals (both before and after transfers) are higher in 2. The policy move could then be rationalized as an attempt to save on administrative costs and to concentrate the assistance "where it is more needed". It may be noted that, as regional targeting reduces total implementation costs, it causes an increase in the net volume of resources channelled to the poor.

For a initial given distribution of the poor between localities, the shift to a regional targeting scheme will generate strong incentives to migrate for P-agents in region 2. These incentives are clearly stronger than in the case discussed previously, since now transfers are simply discontinued in 2, while those going to the poor in 1 increase both because all the assistance budget is directed to them and because total implementation costs are cut. The total income of P-agents in each region is now given by:

$$v_1 = w(P_1^{***}) + \frac{(\theta+k)}{P_1^{***}}$$

$$v_2 = w(P_2^{***}) \quad (13)$$

where P_1*** and P_2*** denote the number of P-agents in both regions under the new transfer scheme. The positive sign of the term in k in the equation for v1 indicates that the poor of region 1 benefit from the drop in administrative costs as the assistance to P-agents in 2 is discontinued.

In order that some P-agents residing in 2 be induced to migrate to region 1, at the initial distribution of the population, total per capita income in 1 must exceed that in 2 by more than the migration costs. This implies:

$$w(P_1^*) + \frac{(\theta+k)}{P_1^*} - w(P_2^*) > c$$

or, recalling the equilibrium condition in the starting configuration with equal net transfers:

$$\frac{(\theta+k)}{P_1^*} > 2c \quad (14)$$

This condition is less stringent that the one applied to the shift to an scheme of equal gross transfers, provided that in this latter case net transfers to agents located in 2 remain positive.

It can be shown that regional targeting also may imply that all P-individuals, including those in the targeted region, are made worse off. Since the policy change affects poor agents in 2 by eliminating transfers, it can cause "reverse" migration to such an extent that the externality on labor incomes in 1 more than offsets the gains from government programs. The difference between the

total incomes per poor in region 1 before and after the shift can be expressed as:

$$\Delta v_1 = w(P_1^{***}) + \frac{(\theta+k)}{P_1^{***}} - w(P_1^{*}) - \theta \quad (15)$$

But the equilibrium condition determining the new population levels is:

$$w(P_1^{***}) + \frac{(\theta+k)}{P_1^{***}} - w(P_2^{***}) = c \quad (16)$$

Therefore, using condition (6) as an equality, (15) becomes:

$$\Delta v_1 = w(P_2^{***}) - w(P_2^{*}) + 2c - \theta \quad (17)$$

Here too, a fall in the income of region 1 P-agents is more likely if wages in region 2 do not increase by much as people leave the area (because in that case, there are more incentives to migrate). This being so, income of the poor in the targeted region can decline if the initial net transfer is large relative to migration costs, even though these agents receive higher government transfers than before (see figure 3).

2.4 An alternative policy: migration subsidies

In this scenario, the government tries to act on the productivity differential between the two regions by offering to cover the migration costs to individuals in region 1 who want to move to 2. The resources used in paying these subsidies are deducted from the social budget; what remains is applied to a scheme of direct transfers of equal net size in per capita terms in both regions. If the government covers the moving costs of all agents who request such assistance, this would lead to incomes

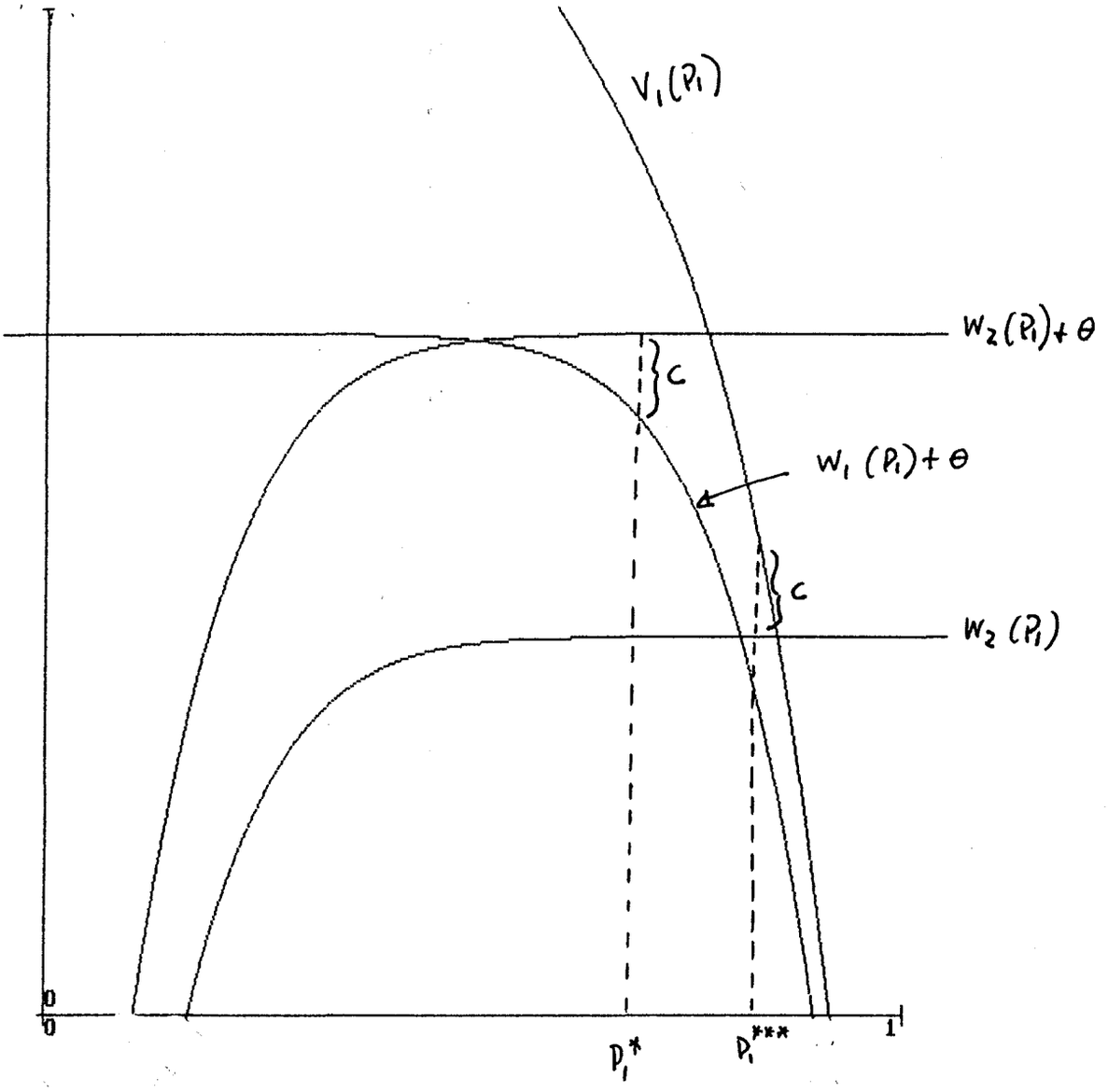

Figure 3

being equalized across regions. Since the net transfers do not vary from one area to the other, the population would now be equally distributed. Therefore, $P_1 = P_2 = 1/2$ in the new equilibrium.

Clearly, the P-agents in region 2 would lose through this policy change, because migration reduces labor incomes while net transfers are reduced. By contrast, individuals in region 1 may benefit if the externality effect there is strong enough. The change in policies has in principle ambiguous effects on the total income of the poor population as a whole. The after transfer income of the representative P-agent under the new policy is given by:

$$v_1 = v_2 = w(\frac{1}{2}) + \theta - c(P_1^* - \frac{1}{2}) \quad (18)$$

because the budget available for transfers is cut in order to finance migration subsidies until the population is symmetrically distributed.

The change in total income in each region can be expressed as:

$$\Delta v_1 = w(\frac{1}{2}) - w(P_1^*) - c(P_1^* - \frac{1}{2})$$

$$\Delta v_2 = w(\frac{1}{2}) - w(P_2^*) - c(P_1^* - \frac{1}{2}) \quad (19)$$

And the difference between the aggregate after transfer income of the poor in the new state and the initial one is:

$$\Delta v = w(\frac{1}{2}) - w(P_1^*) - \frac{c}{2} = w(\frac{1}{2}) - w(P_2^*) + \frac{c}{2} \quad (20)$$

Thus, migration subsidies increase aggregate income of the poor (i.e. they raise incomes in region 1 by more than they lower them in region 2) if the loss of the externality effect in the relatively affluent region (when going from the initial distribution of P-agents to the symmetric case) is small compared with the size of the migration cost.

4. Concluding remarks.

We have explored here various ways in which government policies with social purposes, and productivity externalities may interact. The results indicate that such interactions can be of a kind that may make some policies generate seemingly unintended consequences. Leaving aside the specific features of the analysis, the examples presented in the paper suggest that, if the presence of social externalities on productivity is judged to be of relevance (and we believe it is), the effects on social cohesion (which is not equivalent to uniformity) should not be ignored in policy design: measures which induce people to segregate themselves according to their income level are likely to have significant costs, especially for the poorer groups.

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