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**Working Paper**

## Global integration and world migration

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Oded Stark

## **Global integration and world migration**

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## Abstract

This paper explores the following chain of conjectures: rising use of the internet, the widespread access to global information, and intensified communication between regions and countries brought about, for example, by intensified trade links bring about expansion of people's social space and their set of comparators; this expansion increases people's stress and strengthens their inclination to resort to migration as a means of reducing this heightened stress. Other things held constant, the expansion of people's social space intensifies their inclination to move across geographical space.

*Keywords:* Expansion of social space; Relative deprivation; Migration

*JEL Codes:* A12; A14; B41; D01; F15; F22; J61; O15; Z13

# 1. Introduction

Economists and others have done considerable empirical work on the importance of social interactions and comparisons with others in a number of spheres including consumption choices, financial decisions, a variety of risky behaviors, and migration.<sup>1</sup> One insight from this body of work is that comparisons with those who are “doing better” yield stronger effects than comparisons with those who are “doing worse”. Another is that relative deprivation is a statistically significant explanatory variable of migration behavior.

Stark and Taylor (1991) show that relative deprivation increases the probability that household members will migrate from rural Mexico to the US. More recently, Quinn (2006) reports that relative deprivation is a significant motivating factor in domestic migration decisions in Mexico. Stark et al. (2009) explore the relationship between aggregate relative poverty, which is functionally related to aggregate relative deprivation, and migration. Drawing on Polish regional data, they demonstrate that migration from a region is positively correlated with the aggregate relative poverty in the region. Czaika (2011) finds that in India, relative deprivation is an important factor in deciding whether a household member should migrate, especially for migration over a short distance. Basarir (2012) reports that people in Indonesia are willing to bear a loss of absolute wealth if there is a relative wealth gain from migration. Jagger et al. (2012) demonstrate that relative deprivation is a significant explanatory variable of circular migration in Uganda. Drawing on data from the 2000 US census, Flippen (2013) shows that both blacks and whites who migrate from the North to the South generally have lower average absolute incomes than their stationary northern peers, yet, in the wake of their migration, they enjoy significantly lower relative deprivation. Vernazza (2013) finds that, even though interstate migration in the US confers substantial increases in absolute income, the trigger for migration is relative deprivation (low relative income), not low absolute income. Hyll and Schneider (2014) use a data set collected in the German Democratic Republic in 1990 to show that aversion to relative deprivation enhanced the propensity to migrate to western Germany.

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<sup>1</sup> Soetevent (2006) surveys empirical approaches to identifying social interaction effects in a number of areas. Several overviews are in Benhabib et al. (2011).

Recent theoretical research has shown that the stress (relative deprivation) sensed by an integrated group is higher than the sum of the levels of stress (relative deprivation) sensed by the constituent groups when apart, a so-called superadditivity property (Stark, 2013); in the aggregate, integration intensifies stress.

Building on the empirical findings that stress (relative deprivation) matters for migration behavior and on the theoretical superadditivity insight, the purpose of this paper is to explore the following chain of conjectures: rising use of the internet, increasingly widespread access to global information, and intensified communication between regions and countries bring about expansion of people's social space and of their set of comparators; this expansion increases stress, measured by aggregate relative deprivation; people are more inclined to resort to migration as a means of reducing this heightened stress. In short, other things held constant, expansion of people's social space intensifies their inclination to move across geographical space.

The approach taken in this paper is distinct from the intuitive perspective that access to media, information outlets and the like can reduce the incidence of migration because the destination is better understood so that going there just to find things out may not be necessary. We ought to bear in mind that better information about a destination can work both ways: it can reduce or increase the attractiveness of a destination. Better information can stop people over-estimating expected gains, thereby reducing migration (Farre and Fasani, 2013). On the other hand, better information can endow people with greater confidence about the outcome awaiting them, thereby increasing migration if people adjust their behavior in accordance with risk aversion preferences and consider migration to be risky. Here, we do not assign any characterization to the increased level of information following integration: the information expansion in that regard is perfectly neutral.

We proceed as follows. In Section 2 we define aggregate relative deprivation, and note that the aggregate relative deprivation of a merged population exhibits the superadditivity property. In Section 3 we briefly explain why the world is facing rising migration pressures. In Section 4 we show how and why exposure to heightened relative deprivation *causes* migration. In Section 5 we depict a connection between trade, which we conceptualize as integration of economies, aggregate relative deprivation, and social

welfare. This enables us to illustrate how trade can increase migration pressures. We then present our closing conclusions.

## 2. Measuring aggregate relative deprivation, and the superadditivity property

As in Stark (2013), we define the aggregate relative deprivation,  $ARD$ , of a population - an index of the population's social stress - by the sum of the levels of stress (the sum of the levels of relative deprivation,  $RD$ ) experienced by the individuals who constitute the population. We refer to income-based comparisons, and we quantify the individual's  $RD$  by the sum of the excess income units that others in the population have divided by the size of the population (assuming that the comparison group of each individual consists of all the co-members of his population).

The  $ARD$  of population  $P$  consisting of  $n$  members in which an ordered vector of incomes is  $x = (x_1, \dots, x_n)$  such that  $x_i \leq x_j$  for  $i < j$  is defined as

$$ARD(x) = \sum_{i=1}^{n-1} RD(x_i) = \frac{1}{n} \sum_{i=1}^{n-1} \sum_{j=i+1}^n (x_j - x_i),$$

where  $RD(x_i) \equiv \frac{1}{n} \sum_{j=i+1}^n (x_j - x_i)$  is the relative deprivation experienced by an individual whose income is  $x_i$ ,  $i = 1, 2, \dots, n-1$ , and  $RD(x_n) = 0$  because in the income distribution of  $P$  there is no one to the right of the individual with income  $x_n$ .

Let there be  $l \geq 2$  populations where the size of population  $P_k$  is  $n_k$ ,  $k = 1, \dots, l$ , and let the corresponding ordered vector of incomes of population  $P_k$  be  $x^k = (x_j^k)_{j=1}^{n_k}$ . Integration of the populations is assumed to entail expansion of social space. The merged population is then of size  $n = n_1 + \dots + n_l$ , and the ordered income vector is denoted by  $x = x^1 \circ x^2 \circ \dots \circ x^l$ .

**Claim.** The aggregate relative deprivation of the merged population exhibits the superadditivity property, namely

$$ARD(x^1 \circ \dots \circ x^l) \geq ARD(x^1) + ARD(x^2) + \dots + ARD(x^l)$$

**Proof.** The proof is by induction with respect to the number of merged populations.



A sketch of the proof is as follows. From Stark (2013) we know that the superadditivity property holds for  $l=2$ . We assume that the property holds also for some  $l > 2$  merged populations. We can then show that it holds for  $l+1$  merged populations. The “trick” for achieving this is to merge the  $l+1$  populations sequentially; namely to first merge the first  $l$  populations and subsequently to merge this new population with the  $(l+1)$ th population.

### 3. Rising migratory pressures

The ease with which people in one population, region or country can relate to and compare themselves with people in other populations, regions or countries has never been as great as it is nowadays. Improved literacy, rising use of the internet, widespread access to global information, and intensified communication bring societies together. The seamlessness of this process implies that in terms of the set of comparators, regions “integrate” with regions, and countries “integrate” with countries in a manner that does not depend on trade links or the movement of people; physical flows across borders are not essential to replace the local and separated with the global and integrated. We refer to this form of integration as expansion of social space. And we draw extensively on the social-psychological concepts of relative deprivation and comparison groups.

The superadditivity property presented in Section 2 indicates that as an expansion of social space, integration increases the aggregate relative deprivation sensed by the populations involved. However, this does not imply that in the wake of integration, no individual will experience a reduction in relative deprivation; often, and as illustrated below, some individuals may gain in terms of relative deprivation. But the increase in aggregate relative deprivation brought about by the integration of regions or countries implies that individuals in an integrated population experience jointly more relative deprivation than individuals in the constituent populations when apart.

People do not like to be (more) relatively deprived, and thus react to their exposure to (increased) relative deprivation in a variety of ways, with migration being one of them. This reasoning is not meant to belittle the importance that people attach to absolute income and absolute wage gains. It does indicate, though, that people seek to improve their wellbeing even when their absolute income registers no change, yet their relative income is lowered (their relative deprivation rises). Clearly, a reduction in relative income can arise not only from a decline in absolute income but also from a revision of people’s social space which, for example, entails inclusion in that space of comparators with higher incomes.

The relief that migration could confer in response to intensified relative deprivation does not necessarily arise from alleviating the relative deprivation component of people’s preferences: a gain in absolute income could compensate for a loss in wellbeing caused by

increased relative deprivation - the compensation need not come from where the pain strikes, but it has to alleviate the pain. This, of course, does not negate the possibility of beneficial migration even when income remains the same but the incomes of comparators at destination are lower than the incomes of comparators at origin, for example.

## 4. Links between relative deprivation and the propensity to migrate

In this section we show how and why exposure to heightened relative deprivation can cause migration. We present several examples. We demonstrate how an integration-induced revision of social space changes the inclination to migrate, and how this inclination might be affected by the size and composition of the set of regions. We then consider the role of wage differentials as triggers for migration, showing that when relative-deprivation considerations are taken into account, migration may not lead to wage equalization and may even encourage additional migration. We study relative-deprivation-induced migration pressures under a positive wage differential as well as under a negative wage differential.

### *4.1 Examples of an increasing inclination to migrate in the wake of integration*

To begin with, let there be two separate (non-integrated) regions, henceforth regions A and B, with region B's individuals being uniformly richer than region A's individuals. Other than that, in all relevant respects, the two regions are identical. Suppose that in the wake of migration from region A to region B, an individual obtains a small increase in his income (such that the increase will not make him the richest in region B). The income gain would make migration tempting. Yet in region B the individual will be exposed to higher relative deprivation than in region A, emanating from proximity to the rich natives of region B (a revision of the individual's social space). Consequently, the prospect of relative deprivation may discourage migration. Suppose that having compared the small income gain and the considerable increase in relative deprivation, the individual from region A decides not to migrate. Now, in the sense of social space, regions A and B integrate. Whether the individual from region A likes it or not, the richer natives of region B are now in his comparison group. In this situation, the earlier loss that would have come his way from increased relative deprivation following migration is sunk (it happened anyway). Therefore, the migration originally contemplated will confer only an income gain. Given that decisions are made at the margin, migration to region B will occur.

Consider next migration that is not related to a change in absolute income. Let there be region A where only one individual lives and earns income 2, region B where four individuals live and have incomes 1, 1, 2, and 2, and a richer region C, where only one individual lives and earns income 6. Other than that, in all relevant respects the three

regions are identical. Consider the individual from region A. As a result of intensified communication and interaction between regions A and C, this individual becomes relatively deprived, being exposed to a comparison with the individual from region C. The individual from region A might find that even though if he moves to region B and earns there exactly the same as in region A, namely 2, he will benefit from the change of social space because upon migration his relative deprivation will decrease: using region B as his “base,” he will experience lower relative deprivation than using region A as his “base” ( $\frac{2}{3}$  in  $\{1,1,2,2,2,6\}$  rather than 2 in  $\{2,6\}$ ). Awareness of C does not change upon migration, but the base for the comparison with C does. Thus, as a consequence of being exposed to region C, the individual who thereby becomes relatively deprived will choose to migrate to region B in order to alleviate somewhat his increased relative deprivation. Then, we will have a case in which awareness of region C increases the opportunity cost of not migrating from region A to region B. Notably, in the absence of the “appearance” of region C, the individual from region A whose income is 2 has no incentive to migrate to region B.

#### *4.2 Additional reasoning for increased migration upon integration*

In the standard case in which a wage differential is the underlying cause of migration, movement from a low wage region to a high wage region can be expected to increase wages at origin and decrease wages at destination, such that sufficient migration will end up equalizing wages, thereby neutralizing the incentive to engage in additional migration. Not necessarily so, however, when migration is triggered by distaste for relative deprivation. To see this, suppose that individuals who are prompted to move from region A to region B by relative deprivation considerations enter the income distribution of region B other than at the bottom. They can increase the relative deprivation of the individuals in region B with lower incomes than theirs who, in turn, will then have a stronger, relative-deprivation-based reason to migrate. The migrants from A will reduce the pressure to migrate of those in region B who have incomes higher than theirs.<sup>2</sup> When the former effect is stronger,

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<sup>2</sup> As an example: let the incomes in region B be 3, 8, and 9, and let the migration from region A to region B be of an individual whose income is 7. In this case, the relative deprivation of the region B individual whose income is 3 (the lowest income individual in region B) will increase from  $\frac{1}{3}(5+6) = \frac{11}{3} = \frac{44}{12}$  to

migratory pressures could escalate, not dwindle. Taking the logic of this line of argument a bit further, migration from region A to region B could even prompt migration from region B to region A which, in turn, will trigger migration from region A to region B, and so forth. An example of such a constellation is in the Appendix.

An important inference to bear in mind is that if the regions or countries merge at the same time as the income gap or the wage differential between the regions or countries is reduced (but not eliminated), then the pressure for migration could still increase, not decline.

*4.3 A relative deprivation incentive to migrate in the presence of a positive income differential*

We consider the possibility of migration from region A, where an individual with income 1 is located, to region B, where everyone earns 2. Such migration will increase the income of the region A individual from 1 to 2. We look at two settings. In one setting, the individual with income 1 is alone in his region of origin (or, for that matter, with others in his region of origin who all earn 1). In another setting, the individual with income 1 is in his region of origin together with an individual who earns 5 (and possibly also with others who earn 1 each). In what follows, we address the case in which there is only one individual earning income 1 in region A. Our conclusion would not change if there were several individuals earning income 1 in region A.

We first consider the setting where region A consists of two individuals earning 1 and 5, namely the income distribution in region A is {1,5}. In this case, when the individual with income 1 moves from region A to region B and receives at destination income 2 (a migration denoted by {1,5}=>{2,2,...,2}), the individual obtains migration returns both from higher absolute income and from a reduction in relative deprivation; he was relatively deprived in region A, and he is not relatively deprived in region B. We now consider the other setting in which region A consists only of the individual earning 1. Then, migration of this individual

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$\frac{1}{4}(4+5+6) = \frac{15}{4} = \frac{45}{12}$  while, obviously, the relative deprivation of the region B individual whose income is 8 will decrease.

from region A to region B,  $\{1\} \Rightarrow \{2, 2, \dots, 2\}$ , produces returns to the individual only from higher absolute income because in both regions the individual is not relatively deprived. Thus, in terms of opportunity costs, *not* migrating in the  $\{1, 5\}$  setting of region A (or in the equivalent  $\{1, 1, 1, \dots, 5\}$  setting of region A) carries a harsher penalty than not migrating in the  $\{1\}$  (or  $\{1, 1, 1, \dots, 1\}$ ) setting of region A. An increase of the cost of not resorting to an act strengthens the propensity to engage in the act.

#### *4.4 A relative deprivation incentive to migrate in the presence of a negative income differential*

We consider the following example. Let there be two regions A and B. Let there be two individuals in region A whose incomes are  $y$  and  $3y$ , where  $y > 2$ . Let the individuals in region B earn no more than  $y - 2$ . The region A individual whose income is  $y$  can migrate to region B where the income awaiting him is  $y - 2$ . (Similarly, we can assume that migration from region A to region B entails a cost of two units of income.) The individual likes absolute income and dislikes relative deprivation, and assigns to these two terms in his utility function the weights of  $\alpha$  and  $-(1 - \alpha)$ , respectively, where  $\alpha \in (0, 1)$ . Thus, the individual's utility function can be represented by  $u(x, RD) = \alpha x - (1 - \alpha)RD$ , where  $x$  denotes the individual's income, and  $RD$  denotes his relative deprivation, as defined in Section 2, namely it is the aggregate of income excesses divided by the size of the population. Then, if  $\alpha y - (1 - \alpha)\frac{1}{2}(3y - y) < \alpha(y - 2)$ , or, alternatively, upon rearrangement, if  $\alpha < \frac{y}{y + 2}$ , the

individual will prefer to migrate to region B. Defining  $\frac{y}{y + 2} = \frac{1}{1 + \frac{2}{y}} \equiv \alpha_0$ , it follows that as  $y$

increases,  $\alpha_0$  increases: as incomes rise, the constraint on  $\alpha$  ( $\alpha < \alpha_0$ ) for the individual's preference to migrate to region B becomes weaker. This is intuitive because the higher is  $y$ , the less meaningful the difference between  $y$  and  $y - 2$ , so leaving region A for region B involves an increasingly smaller relative loss of income, along with a significant (complete) reduction in relative deprivation.

#### *4.5 Relative deprivation, relative risk aversion, and migration as a gamble*

It is possible, and in some contexts it is highly appropriate, to view migration as a gamble, for example, when an individual gives up employment at origin that pays poorly for

the probability at destination of either better-paid employment or unemployment. The willingness to gamble can be measured by the coefficient of relative risk aversion. When regions integrate, aggregate relative deprivation is higher. In research in progress we find that, holding income constant, people who are more relatively deprived exhibit lower relative risk aversion (the proof is available on request). Then, risk aversion becomes an intervening variable between relative deprivation and migration, and the prediction that migration is undertaken in response to, and as a means of, reducing relative deprivation is strengthened by the consideration that higher relative deprivation weakens attitudes that are antagonistic to the pursuit of migration.



## 5. Concluding remarks

The ideas presented above suggest an interesting link between trade, conceptualized as integration of economies, aggregate relative deprivation, and social welfare. We consider this link in order to inquire how trade can affect migratory pressures, and we then present our closing conclusion.

We consider the following scenario. Economies that, to begin with, were separated are now integrated via trade. The trade lifts the earnings of some people, or of everyone. We consider the possibility that the trade-generated increase in incomes is accompanied by an increase in aggregate relative deprivation, which emerges as a result of integration of the economies. Naturally, the income increase affects positively the wellbeing of the individuals who experience the increase, while the heightened relative deprivation arising from the integration of the economies reduces their wellbeing. Suppose that the weight attached to relative deprivation in the individuals' preferences is such that the overall impact on social welfare, measured by the aggregate of the levels of wellbeing of the individuals, is negative. In some circumstances, the negative impact might be negated by redistribution of income between the individuals in the trading economies. However, in other circumstances, the redistribution may fall short of delivering a welfare gain, especially when there is a deadweight loss of tax and transfer. Put succinctly, the distaste for relative deprivation renders trade less appealing when trade is viewed as a technology that integrates non-trading economies in the sense of merging separate social spheres into one.

The constellation of trade gains being overtaken by relative deprivation losses can arise even when the income of every individual increases. Take, for example, the case in which as a result of trade, the initial (pre-trade) incomes  $\{1,2\}$  are replaced by incomes  $\{2,10\}$ ; the weight,  $\alpha$ , accorded to the relative deprivation experienced by the lower income individual is large; and the preferences of that individual are given a high enough weight in the social welfare function. This implies that an increase in this individual's relative deprivation will lower social welfare considerably.

To begin with, under no deadweight loss of tax and transfer, both individuals can be made strictly better off with trade upon transfer of 4 income units from the higher income individual to the lower income individual;  $\{6,6\}$  strictly dominates  $\{1,2\}$  for all values of  $\alpha$ .

And keeping the higher income individual as well off as prior to trade, and the lower income individual strictly better off can be achieved even under an extreme deadweight loss that literally “wipes out” eight income units when taken away from the higher income individual, as then  $\{2,2\}$  dominates  $\{1,2\}$ .

Suppose, however, that before trade took place, the two individuals in two separate economies earn 1 and 4 (there are no other individuals in the two economies). With and because of trade, the two economies integrate, and the individuals' incomes rise, respectively, to  $1+\varepsilon$ , where  $\varepsilon$  stands for a small positive value, and 5. The lower income individual experiences an increase in relative deprivation. For the higher income individual to be as well off as before trade took place (not to be worse off than before), he will need to be left with 4. Then, under no deadweight loss of tax and transfer, the lower income individual can at most have  $2+\varepsilon$ . Yet  $2+\varepsilon$  in an income distribution  $\{2+\varepsilon, 4\}$  could be worse for the lower income individual than having income 1 in income distribution  $\{1\}$  if his  $\alpha$  (the weight he accords to relative deprivation) is high enough. Conversely, for the low income - high  $\alpha$  individual to be at least as well off following the trade and integration, he will need to experience hardly any relative deprivation; in other words his income will need to be approximately equal to the income of the higher income individual. Given the possible redistribution of incomes within the population under no deadweight loss of tax and transfer, the lower income individual will need to have an income very close to  $3+\varepsilon/2$ , with the higher income individual having just a little more than  $3+\varepsilon/2$ . But this income redistribution will render the higher income individual worse off than before trade took place unless  $\varepsilon$  is greater than or equal to 5, which contradicts our initial assumption that  $\varepsilon$  is small. What this example illustrates is that for there to be a strict social welfare gain from trade, the direct gains from trade need to be larger than some critical threshold. And an implicit consequence is that through the channel identified above, trade could result in increased migratory pressure.

The long-held view that a narrowing income gap between rich and poor countries will lead to lower migration pressure is not encompassing enough to account for a situation in which rising incomes are accompanied by expansion of the comparison environment. While absolute deprivation (the prevalence of low incomes) declines, relative deprivation can increase and, with it, resorting to migration as a means of quelling heightened relative

deprivation. That the world faces increasing, not dwindling migratory pressures can, at least in part, be attributed to the world experiencing rising aggregate relative deprivation as a result of global integration.

# Appendix

Let there be two regions, let the cost of moving between the two regions be nil, let the two regions be identical in all relevant respects, and let the individuals' incomes be constant. This last assumption means that when an individual migrates, he takes along his income (as if he was born with that income, so to speak). The region in which an individual resides constitutes the individual's comparison group. The individual prefers to be in the region where his relative deprivation is lower. The individual is rational, but not sophisticated: he cannot take into consideration the contemporaneous migratory behavior of other individuals, yet his wellbeing is affected by the migration behavior of all other individuals. Once the migration of others is unraveled, an individual can, without cost, adjust his location. When there is a tie, individuals stay where they are.

Consider the following two examples. First, suppose that there are four individuals with incomes 12, 11, 8, and 5 who, to begin with, are all in region A. We refer to the individuals according to their levels of income, that is, an individual with income  $x$  is named individual  $x$ . Let empty region B come into being or become accessible. The evolving dynamics is depicted by the following sequence:

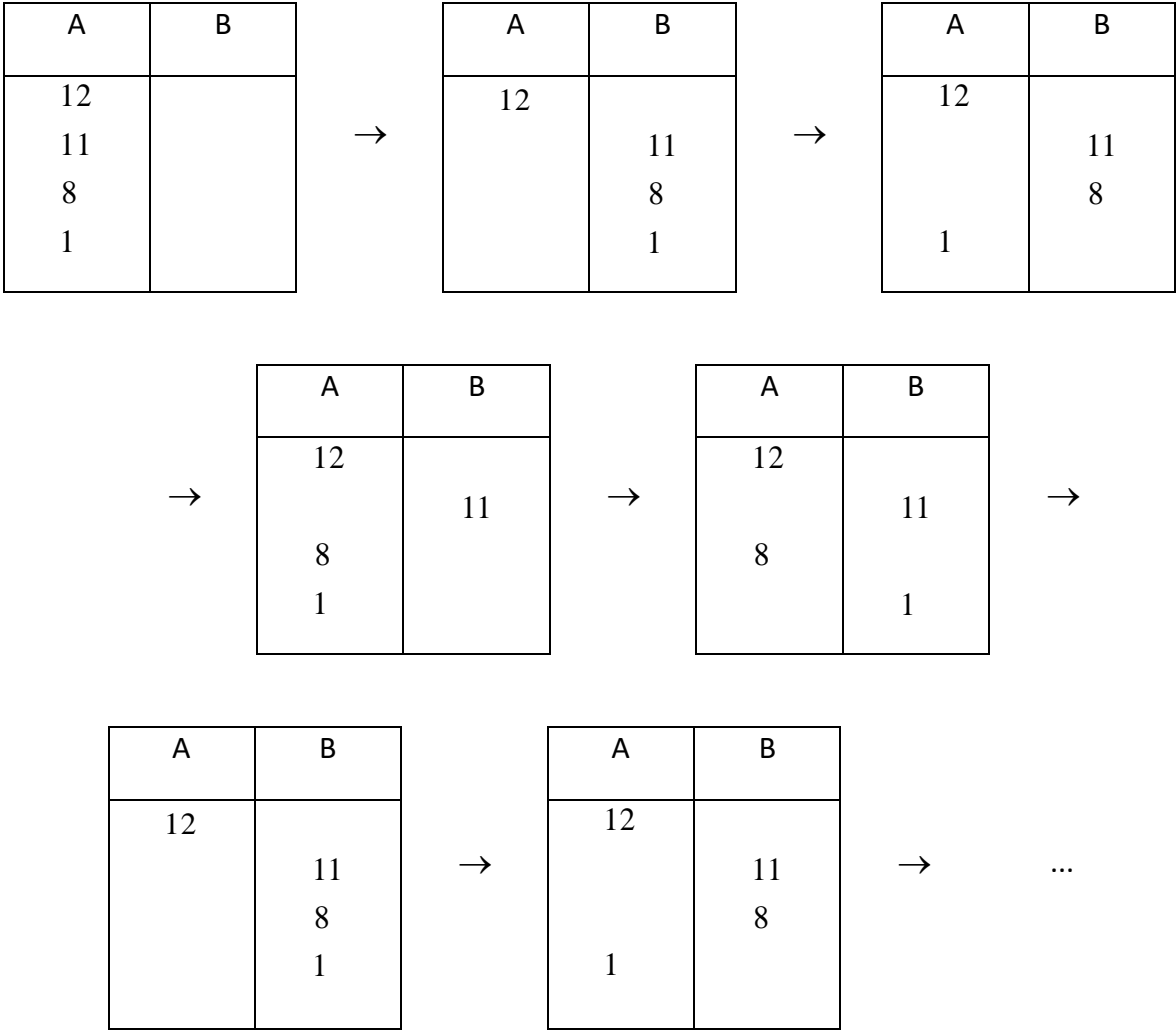
A	B
12	
11	
8	
5	

→

A	B
12	
	11
	8
	5

Because now none of the individuals has an incentive to migrate (migration will not lower the relative deprivation of any of the individuals), we conclude that a spatial steady state (a state in which no individual can gain from migrating, so all migration comes to a stop) is reached in just one period, with individual 12 in region A, and individuals 11, 8, and 5 in region B.

Second, suppose that the income of the poorest individual is 1 rather than 5, so that we now have four individuals with incomes 12, 11, 8, and 1. Such a change alters the migration dynamics as reported above: it changes the consideration of the poorest individual and influences his region of choice which, in turn, affects the consideration of individual 8 and his location decision; the change in the income of the poorest individual inflicts a “migration externality” on the second poorest individual. To see this, let all four individuals again begin in region A. Now empty region B comes into being. The evolving dynamics is depicted by the following sequence:



We see that in this case, the process repeats itself ad infinitum and a steady state is not reached. The perpetual movement in this example (in which individual 8 will always want to be located where individual 1 is located, and individual 1 will always want to be located

where individual 8 is absent) emanates from the fact that the behavior of individual 8 is “tied” to the presence of individual 1 in that this presence reduces the pain experienced by 8 in looking up at the top income individual in the region.

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