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Discussion Paper Series

THREE NOTES ON THE ECONOMIC  
PERFORMANCE OF MIGRANTS

by

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and Oded Stark\*

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MIGRANTS AND MARKETS

by

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## ABSTRACT

In recent research, the question "Why do migrants fare as they do?" has largely been answered through an inspection of the vector of migrants' characteristics. The main theme of the current paper is that special features characterize the interaction (the nature of trades) between migrants and the markets they join and that market characteristics largely account for the labour market performance of individual migrants.

In recent research, considerable effort has been devoted to study the determinants of migration. In our own work we have examined various factors such as informational asymmetries, attitudes toward risk, relative deprivation and intra-household interactions as causes. The subject of the returns to migration or the performance of migrants in the receiving economy has received lesser attention. To a large extent the question "Why do migrants fare as they do?" has been answered through an inspection of the vector of migrants' characteristics. Possession, or lack of, human capital assets such as skills has been taken to account for migrants' earnings - an approach which is in consonance with that accorded to non-migrants. The idea that special features characterize the interaction between migrants and the markets they join and that market characteristics largely account for the labour market performance of individual migrants has not been pursued. It is this idea which constitutes the main theme of the current paper.

Our motivating example is recent migration to the United States. Several stylized facts stand out. First, migrants from a given origin, e.g., source country, are not randomly dispersed across the absorbing economy nor are they all concentrated in one single labour market. Migrants tend to form clusters. For example, returns from the 1980 US census indicate that Asian male migrants who arrived during the 5 year

period preceding the census concentrate in four main SMSAs: Los Angeles, New York, San Francisco and Chicago. Second, the intertemporal distribution of the clusters of migrants is not stationary. The distribution across labour markets of migrants of high order waves does not replicate the existing distribution. For example, a comparison of the distribution of Mexican male migrants who arrived in the US during the 5 year period preceding the 1980 census with Mexican male migrants who arrived in the US during the 5 year period preceding the 1970 census reveals less clustering; only 60 percent of the recent arrivals chose Chicago and Los Angeles whereas a full 76 percent of the earlier arrivals so chose. Third, even though the absolute size of a migrant group within a given labour market is often large, in comparison with the absorbing population (e.g., the native born), migrants do not constitute large groups. Fourth, recent migrants are assisted by established migrants; there is heavy reliance upon and usage by the new migrants of "network and kinship capital". Fifth, virtually by definition, migrants have several traits distinguishing them from the population they join. Some characteristics are (costlessly) observable. The differentiation by traits often results in a statistical discrimination, that is to say, migrants as a group are treated differentially by the non-migrants than the non-migrants are treated by the non-migrants e.g., migrants are paid less, on

average, than equally skilled non-migrants. Sixth, in many circumstances, migrants outperform the native born. Usually this result obtains with a time lag from the migrants' arrival. It tends to hold even after allowance is made for the standard controls.

Although with greater or lesser ease each of these stylized facts may be explained separately, no explanation which causally links all of them appears to exist. It might be useful to attempt to sketch the outline of a possible explanation. We begin by explaining the clustering of migrants through an application of a random walk rule in conjunction with scale economies to trade. Suppose that at the start, migrants choose the labour markets they join randomly. Successive migrants arrive and each chooses a labour market, taking into consideration several factors one of which may be the presence of migrants who have arrived in the preceding period(s). Even if each new migrant were to choose randomly among the labour markets, after several waves of migration, say at time  $t$ , a specific market will likely have more migrants than others. When each of several players repeatedly tosses a die, at some point one player will have scored more odd numbers than the other players even though after many rounds all would score odd numbers exactly the same number of times.

Suppose the concentration of migrants is subject to scale economies which are quite sensitive to changes in the number of migrants when the number of migrants is small. The scale economies (and diseconomies) arise from trade considerations as explained below. Consequently, from some point in time  $t$ , a particular market will become more attractive to all subsequent migrants, and clustering will evolve. Now suppose that in contrast, the native population which is much larger in numbers is subject to decreasing returns to scale. Then, from some point in time, the migrants may obtain an edge and outperform the natives. To the extent that migrants of an early vintage are aware of the sensitivity of the onslaught of scale economies to the overall number of migrants in their particular location they may well undertake steps to support and induce new migrants to join them. Consequently, the choice of destination by the new migrants is less likely then to be random. This process will not continue if increasing returns at a specific location prevail no more while they do in another location. The intensity of the pull exerted by that other location will then transform it into the more attractive destination and hence the pattern of several clusters. So long as migrants constitute a distinct group from the natives in the sense that there is no cross over between "their" increasing returns and "the natives'" decreasing returns, the explanation as outlined above can account for all six stylized facts.

Scale economies leading to differences in the returns to trade (exchange activities) may arise from differences in the structure of interactions viz., in the manner in which trades are being conducted. This manner, in turn, is largely determined by the likelihood of trades being repeated. This likelihood affects the incentive to invest in reputation and the choice whether to execute trade cooperatively or not. When the number of migrants is very small the likelihood of repeated trades with fellow migrants is low since by necessity many trades will be conducted with members of the host community. When the number of migrants becomes very large, the need for a repeated trade with any given agent or sub-set of agents dwindles and even among migrants trades are conducted in an environment of anonymity. With a negligible likelihood of trades being repeated, tomorrow's reaction by a partner to today's trade will not matter and hence there will be no inducement to undertake steps either to build and sustain reputation or to protect against retaliation. If, however, the number of migrants is neither too small nor too large and the likelihood of repeated trades amongst them is reasonably high, short term gains from non-cooperation will be more than offset by losses from adverse reputational effects and a pattern of cooperative trades could ensue. Variables tending to raise the likelihood of a repeat meeting among migrants, e.g. barriers of

various types to trades with outsiders, somewhat paradoxically, may be to the migrants' advantage in inducing a pattern of cooperative trade amongst them which accounts for, or contributes to, migrants' superior performance. Whereas for a relatively small migrant population being distinct from the absorbing population is cost-free (recall migrants' possession of visible distinguishing traits such as colour, language, accent, pattern of behaviour, etc.), forming a distinct group might be quite costly for a sub-group of agents of the absorbing population who recognize the advantages associated with cooperative trades. This is so especially because there is an incentive for members of the complementary portion of the absorbing population to "raid" the sub-group with non-cooperative trades, hoping not to be recognized for what they are.

This line of reasoning, rudimentary as it is, leads to several interesting predictions and policies. These differ from predictions offered and policies mandated by existing models or theories. New migrants may not necessarily receive the greatest degree of help from an established community of migrants when such a community is large since the advantage accruing to the latter from a marginal increase in its size might be much smaller than the advantage accruing to a smaller community from a similar increase. Efforts to disperse migrants across a large number of receiving markets or



communities may fail in as much as migrants recognize the advantage associated with regrouping and the formation of optimal size clusters. Likewise, efforts to direct new migrants to existing concentrations of migrants guided, for example, by a reasoning that the established migrants could provide social (welfare) services thereby substituting for public outlays will fail if clusters are already at their optimal size; large concentrations will tend to disgorge rather than absorb the new arrivals. Since clustering rewards "distinguishable migrants" but not others, it would be reasonable to expect the former to be much more concentrated than the latter. If, for example, the US distribution of migrants were to be compared with that of native born of the same ethnic origin, the native ethnic groups should be expected to be more dispersed throughout the US than the migrants. In addition, given the pace and the extent of the assimilation of migrants into a host population, markets characterized by quicker and fuller absorption will be more "able" to accommodate additional migrants than will markets characterized by slower and partial assimilation. Markets of the former type will find it possible to continuously absorb migrants without hitting the optimal capacity constraint. And finally, by undermining the returns from, thereby the incentive for, cooperative trades, efforts to hasten the integration of

migrants into the host economy and render the integration more complete (a process assisted by acculturation and socialization efforts) may not be in the migrants' best interest.

WHY DO MIGRANTS FARE AS THEY DO?

by

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## Abstract

This paper offers a new explanation for the often observed higher mean income - higher income variance of migrants vis-à-vis the native-born. The explanation is based on the relative lack of information about migrants in the receiving country rather than on the attributes of migrants. It accounts for several important stylized facts and generates predictions different from those of the attributes explanation.

## I. Introduction

Groups of first generation migrants who have been in their new country for a while often have a higher mean income and a greater variance in income than the indigenous (native-born) population.<sup>1</sup> The migrants' higher mean income may seem somewhat perplexing given the informational, language, social, institutional and other barriers which usually stand in a migrant's way. In addition, given that often migrants as a group are economically discriminated against by the indigenous population e.g., migrants are paid less, on average, than equally skilled non-migrants, the evidence of the migrants' higher mean income becomes a formidable puzzle. Yet notwithstanding these impediments to success, migrants do in many circumstances outperform the native-born. Indeed, although this result obtains with a time lag from the migrants' arrival, it does tend to hold even after various success-related attributes such as educational qualifications are normalized.

One possible explanation for this phenomenon may be found in the nature and characteristics of economically motivated migrants; those that tend to migrate for economic reasons are likely to be self-selected in a number of success-related ways. Such migrants will be younger, more enterprising, more aggressive, less risk averse as well as possessing a higher amount of human capital. This human capital will be

characterized by a higher average ratio of general to specific human capital than the equivalent ratio in the indigenous population. Hence, the migrants' human capital will be more flexible. This vector of characteristics of economically motivated migrants is likely to be reflected in various aspects of behaviour. Migrants will display high risk taking behaviour, aggression and dynamism, and keen entrepreneurship, all contributing to higher incomes. In addition, it should be noted that since in general the return to a high risk activity has a higher mean and a higher variance than low risk activity, given that migrants are prepared to take more risks than the indigenous population, they will experience a higher average income combined with greater income variance.

The purpose of this paper is to offer another explanation for the high mean - high variance of migrants' income. This explanation is based on the relative lack of information about migrants in the receiving country, rather than on the attributes of migrants. To a large extent the explanation offered here is non-contradictory to and can be viewed as complementary with the economic migrants' attributes explanation presented above. Nonetheless, the argument put forwards here does allow certain predictions to be made which are different from those of the attributes explanation. Hence, discriminatory tests between the two explanations are possible.

## II. Some Stylized Facts

Before we present our basic argument, we consider several stylized facts revealed by a study of men aged 18-64 as documented by the 1970 and the 1980 U.S. Censuses. We draw especially on the valuable summary statistics and analysis provided in Borjas (1986).

- (a) The probability that a person who is foreign-born will be self-employed is significantly higher than the probability that a similarly skilled indigenous member of the population will be self-employed.
- (b) Self-employed workers have higher incomes than salaried workers. This is true for both indigenous and migrant workers.
- (c) A migrant's level of education has a positive correlation with his self-employment probability, i.e., the better educated migrants are, on average, more likely to be self-employed.
- (d) Labour market experience in a migrant's home country has a positive correlation with his self-employment probability, i.e. those that have worked some years before migrating will have a greater tendency to become self-employed in the receiving country.
- (e) Amongst the migrant population, being married has a positive correlation with being self-employed.



A theory of why foreign-born men earn more on average than U.S. men should be capable of explaining the above five facts. It seems to us that a line of argument that draws on the theory of asymmetric information in labour markets may prove useful as the basis for such an explanation. In particular, it appears that the stylized facts as outlined above are at least as well explained by the proposed argument as by the competing explanation presented in Section I.

### III. The Model

Our basic argument is that when migrants arrive in a new country (the U.S. in our case) they will tend to be initially viewed by potential employers as homogenous in terms of their ability. This is because U.S. employers will lack the ability to discern between the skill levels of different workers. Hence, workers with a high skill will be offered the same wage as low-skill workers. In addition, it seems likely that, at least initially, all migrant workers will be paid the lowest possible wage. This is so because giving a worker a task which might be beyond his ability will, on average, be costly to the employer. The reason for this is that such a worker may, because of errors of judgement or just plain ignorance, cause damages, waste materials, bring about delays, and so on. Therefore, if the initial period is not very lengthy, and with employers' being risk averse, a migrant of unknown skill will

tend to be initially employed in the lowest skill (lowest paid job). In general, only in the long run will all relevant aspects of a worker's skill be fully revealed; only then will the migrant be paid the wage appropriate to his skill. Until then, as his skill is increasingly recognized, his job level and wages will rise.

Hence, the present value of the life-time earnings of a migrant employee with skill level  $\theta$  can be defined as  $V(\theta)$  whereas a similar but indigenous employee with skill level  $\theta$  receives a present value of lifetime income  $W(\theta)$  where  $\frac{\partial V}{\partial \theta} > 0$ ,  $\frac{\partial W}{\partial \theta} > 0$  and  $W(\theta) > V(\theta)$  for all  $\theta$ .

This will tend to hold true even if some migrants possess a foreign certificate or other signal of skill achievement in their home country. At least for the initial wave of migrants from a given country, such signals will tend to be viewed with skepticism in the receiving country since there will be relatively little knowledge of what precisely such signals represent. Clearly, internationally recognized certificates, and especially such certificates that have the backing of the receiving country's educational authorities, will be of some value, but even then some employer doubt is likely to remain.

We note that the distinction between first wave and second and higher order waves of migration from a given country to the U.S. is important. Higher order waves of migration will arrive when U.S. employers have had certain experience with first wave

migrants and possess more knowledge about the correlation between foreign signals and skills. In addition, there will now be a larger number of U.S. residents (namely the first-wave migrants and their children) who are able to communicate both with the new migrants and potential employers. Such early migrants can better investigate the true skill levels of the new migrants as well as have a better understanding of the signals provided by them. Furthermore, some early-wave migrants may now be employers themselves, and they will not face the same informational asymmetry as indigenous employers. High order waves migrants will thus benefit from the knowledge imported to the receiving country by the first-wavers. First-wavers can thus be viewed as providing positive externalities to higher order wavers.

Let us now return to the issue of first-wave migrants. We wish to demonstrate that as a result of market conditions in the receiving country, migrants have a greater tendency to be self-employed than indigenous workers. In order to show this as simply as possible we develop a diagram through which this and other results can be illustrated.

We begin by assuming that the present value of wages to an indigenous employee of a given skill level  $\theta$  in a given industry  $X$  is  $W(\theta, X)$ . Similarly, we assume that self-employment yields an indigenous employee an uncertain present

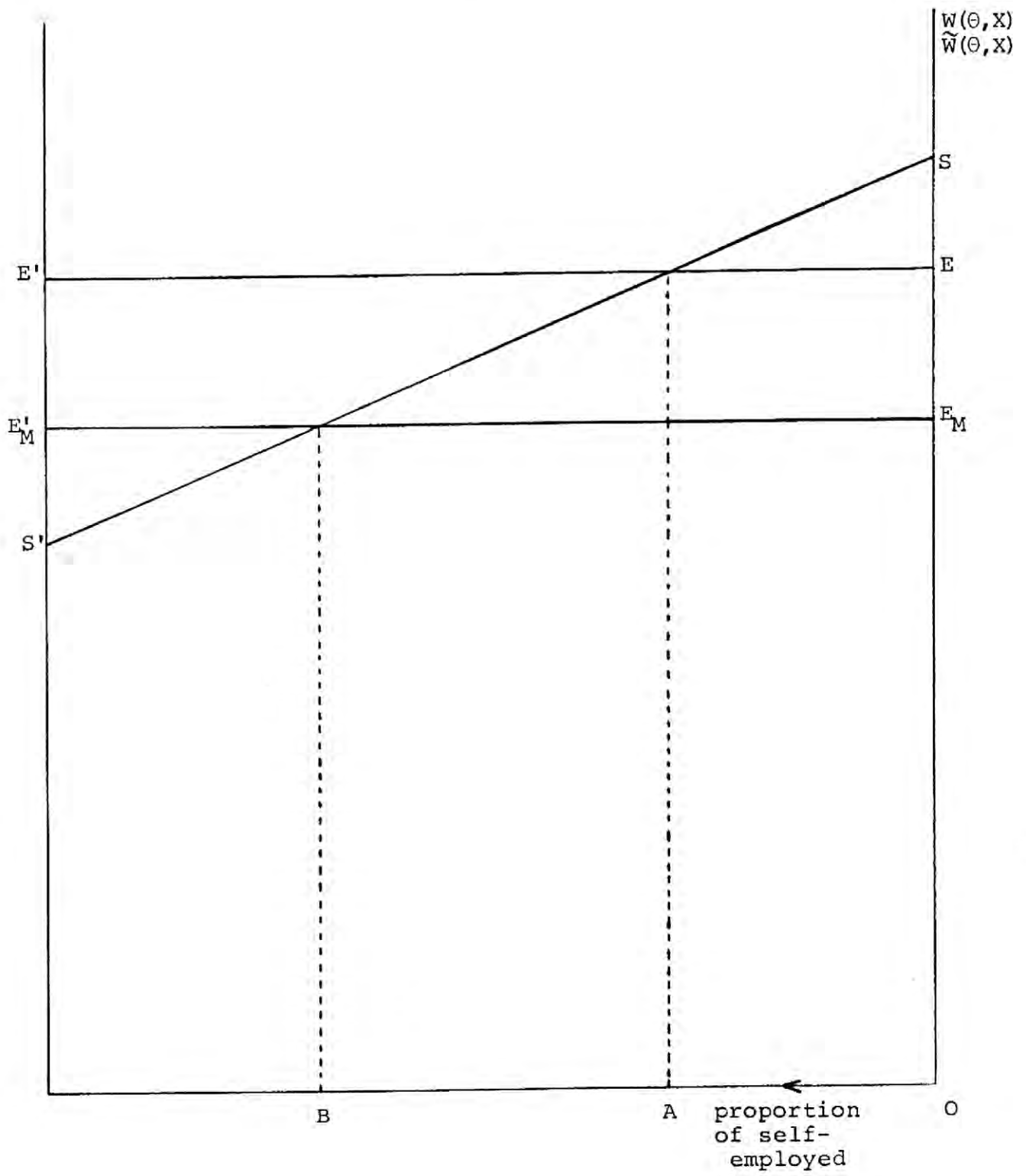


Figure 1

value of income  $\tilde{W}(\theta, X)$  and that the distribution of  $\tilde{W}$ , for a given  $\theta$  and  $X$ , is given.

Now, let all indigenous workers defined by  $(\theta, X)$  have identical preferences except in their attitude toward risk. Thus, while it is assumed that all workers are risk averse, the degree of risk aversion varies between workers. In general, self-employment tends to be riskier than being an employee. This implies that self-employment provides a higher average return and a higher variance of the return than wage employment. Hence, workers with low risk aversion will most value the risk premium to self-employment whereas those who are very risk averse will put a low value on the risk premium to self-employment. Another way of looking at this is to view low risk aversion individuals as having a high certainty equivalent present value of income from self-employment and individuals who are more risk averse as having a certainty equivalent present value of income from self-employment which is low.

Hence, indigenous workers can be ordered by their certainty equivalent income from self-employment. In Figure 1, this certainty equivalent wage is plotted, assuming continuity, starting from the highest certainty equivalent wages, against the proportion of  $(\theta, X)$  workers who have an equal or higher certainty equivalent wage from self-employment. This relation is depicted by  $SS'$ . Clearly, those workers at  $S$  are the least risk averse workers and are the ones who most benefit from

self-employment. As we move down on  $SS'$  towards  $S'$  we encounter increasingly risk averse workers until at  $S'$  we find the workers with the highest level of risk aversion. These workers are least partial to self-employment.

In contrast with the above (and given the homogeneity of all indigenous workers), the present value of the income from wage employment of indigenous workers in the  $(\theta, X)$  class is the same for all these workers. Hence, it is plotted as the horizontal line  $EE'$  in Figure 1.

The equilibrium distribution between self-employed indigenous workers and indigenous workers who are employees will clearly occur at the intersection of  $SS'$  and  $EE'$ . Hence, the proportion of self-employed indigenous workers will be  $OA$ .

Consider now migrant workers. Following our earlier discussion, migrant employees will in general obtain a present value of income lower than indigenous employees. Therefore, the curve relevant to wage-employed migrants in the  $(\theta, X)$  class is lower than  $EE'$ . Let the migrant's employment curve be depicted by  $E_M'E_M$ .

In contrast, let the output of self-employed migrants be accepted by consumers for the actual (and easily recognizable) skill embedded in it. Also, note our earlier comment that our result does not depend on differences in the characteristics of migrants and the indigenous population. Hence, assuming that the attitudes toward risk among migrants are identically

distributed as those of the indigenous population (i.e. migrants do not self-select by risk aversion), the certainty equivalent curve of self-employment is  $SS'$  for migrants also. Hence the equilibrium is at the intersection of  $E_M E_M'$  and  $SS'$ . It follows immediately that the proportion of self-employed migrants is  $OB$ , and this clearly exceeds the proportion of self-employed indigenous workers  $OA$ . Hence a greater proportion of migrants will tend to be self-employed than indigenous workers. On average this provides migrants with a risk premium and makes migrants wealthier (on average) than the indigenous population. Note that this result is obtained without assuming that migrants have special attributes.

As a corollary to the above, it seems likely that as a consequence of informational asymmetry those workers with skill level  $\theta_1$  lose more than workers with skill level  $\theta_2$  where  $\theta_1 > \theta_2$ . This arises because, as argued above, initially all skill groups will tend to be treated equally by employers so that those with greater potential earnings (i.e. those with higher skill) will lose more. In terms of Figure 1 this implies that the  $E_M E_M'$  curve will be lower for workers with higher skill levels. In turn, this suggests that higher-skilled individuals will have a greater tendency to be self-employed than lower-skilled individuals.

As noted above, our result will occur only if employers view migrant labour skills as more uncertain than the



uncertainty faced by consumers when buying goods and/or services made by migrants. We suggest that this condition is likely to be satisfied for most outputs in most cases.<sup>2</sup>

General support for our suggestion is obtained by contrasting the relatively short procedure associated with the purchase of most goods and the long procedure involved in the hiring of most labour. (This differential holds despite the fact that most consumer goods cannot be returned whereas labour may be fired with relatively short notice).

#### IV. Explaining the Stylized Facts

From the discussion in the preceding section it becomes clear why, in comparison with indigenous workers, migrants to the U.S. will tend to be proportionately more self-employed in most professions. It also becomes clear that the activities in which self-employed migrants will concentrate will be those that do not require too much consumer trust. For example, the demand by the indigenous population for a self-employed migrant doctor is likely to be small, since there will be uncertainty regarding his output (diagnosis). Hence the uncertainty about his skill may render his earnings low. Therefore, at least initially, migrant doctors will tend to work in hospitals (and be underpaid).<sup>3</sup> In contrast, there will be many migrants in small manufacturing or in services where the value and quality of the product is clearly and easily identifiable e.g., tailors

and taxi drivers. In addition, migrants will be trusted to cook well the types of food eaten in their country of origin, so that they will often be owners of restaurants specializing in the foods of their country of origin.

Thus, the first two stylized facts in section II have been accounted for by our model. First, we now have an explanation as to why migrants tend to be proportionately more self-employed. Second, the above point, in turn, explains why migrants have a higher average income with a higher variance than the native-born.

Stylized fact (c) is also explained by our model. Migrants of higher educational levels may possess certificates indicating their years of education, but these may not be trusted by potential indigenous employers. Hence, they will be initially paid as uneducated workers despite their human capital. The uncertainty of employers in the receiving country regarding levels of human capital will impose a high cost on educated migrants, and this cost will be an increasing function of their educational level.<sup>4</sup> Therefore, there will be a positive correlation between a migrant's level of education and the probability of his being self-employed. Thus, workers with high skills will tend to be self-employed. Stylized fact (d) is similarly explained by reference to the human capital gained through experience in the labour market. Those with the greatest human capital (in this case, with greatest work

experience) will lose most by being employees and hence will tend to be self-employed.

Finally, the presence of a wife is likely to help a self-employed male migrant in the following way: The migrant's wife may work as an employee and confer a diversification advantage on the family's income. Given that women in LDCs tend to have low training and education levels, even if information were fully available, they would be paid a very low wage. Hence they lose little by being employed rather than being self-employed. Thus, having a wife in the U.S. provides the migrant family with a cheap diversification device which single migrants do not have. Indeed, in the absence of a wife to facilitate income diversification, single migrants may well choose to be employees despite the asymmetric information induced costs of this choice.

#### V. Second or High-Order Wave Migration

One natural device which migrants might adopt in an attempt to mitigate the cost of being employees upon their migration is to enter markets where the asymmetric information problem is muted. This will most likely happen if migrants were to work as employees for other migrants from the same country. Assuming that migrants of an earlier vintage can perfectly interpret home country signals about skill achievements, new migrants will have an incentive to locate where earlier

migrants have located. This will result in a cluster-shaped distribution of migrants. (The distribution of the existing stock of migrants will thus constitute a good predictor of the distribution of new migrants). This reasoning suggests a complementary relationship between old and new migrants. And indeed, at least one study we know of (King, Lowell and Bean (1986)) presents results wherein in spite of a continuing concentration of Hispanics (in the southwestern states, Florida and the Northeast), the earnings of the Hispanic immigrants and the native Hispanics are positively correlated.<sup>5</sup>

The evidence of the distribution and locational choices made by second wave and higher order wave migrants might be summarized as follows. "If we strive to draw general conclusions about the location choice behavior of the new immigrants to the United States, about the only thing that can be said is that all of the immigrants prefer to live in cities where their fellow countrymen are already located but this relationship is much weaker for the more educated immigrants" (Bartel (1986), p.31). Note that following the above discussion, the more educated a migrant is, the greater will be the probability of his being self-employed. Thus, the better educated migrants will not benefit to the same extent from clustering as will the less educated migrants and thus will cluster less.

## VI. Discriminating Tests

Although a test distinguishing between the migrants' characteristics explanation and the asymmetric information explanation may appear quite difficult to design, at least two particular such tests are possible. First, consider the case of politically motivated migrants such as refugees. Usually these do not constitute an economically self-selected small group of people from a given country or region. Hence they are unlikely to possess the characteristics attributed to economically motivated migrants. Therefore, in the case of a large group of political refugees entering a host country economic success will constitute evidence corroborating the explanation advanced here, whereas lack of economic success will provide support for the attributes of migrants theory.

Second, consider migrants moving within the same country where, in their new region, the same language is spoken, the same certificates are accepted, etc. Such migrants will not be discriminated against as employees and hence will have no special motivation to become self-employed. Our theory would be supported if, in this case, the migrants and the indigenous population are self-employed in equal proportion. On the other hand, the attributes of migrants hypothesis would be supported if the proportion of migrants who are self-employed exceeds the same proportion for the indigenous population.

## Notes

- 1 For recent studies on the difference between the economic success of migrants and natives see, for the U.S., Chiswick (1986) and, for Canada, Bloom and Gunderson (1987).
- 2 When it is not, migrants will tend not to become self-employed in that profession.
- 3 To protect its own reputation the work licencing entity, e.g. the professional association, which is also somewhat ignorant of the migrant doctor's true skill, may (implicitly or explicitly) induce him to operate as part of a large team (hospital) rather than alone.
- 4 See Katz and Stark (1987).
- 5 These results are largely replicated in the case of illegal Mexican migrants and native Mexican Americans (see Bean, Lowell and Taylor (1988)).

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MIGRANTS' SAVINGS, THE PROBABILITY  
OF RETURN MIGRATION AND  
MIGRANTS' PERFORMANCE

by

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## ABSTRACT

This paper highlights a difference between migrants and the native-born viz., a positive probability of return migration. An overlapping-generations model is used to show that this probability results in migrants' saving more than comparable native-born. This differential helps explain why migrants often outperform the native-born in the receiving economy.

## I. Introduction

First generation migrants who have been in the receiving country for some time often have a higher mean income than the indigenous (native-born) population. Given the information, knowledge, language, social, institutional and other barriers which are usually erected in a migrant's way, the evidence of higher mean income may seem somewhat perplexing. Enhancing the puzzle is the evidence that often, migrants as a group are treated differently than non-migrants by the indigenous population (e.g., migrants are paid less, on average, than equally skilled non-migrants). Yet in many circumstances migrants outperform the native born. Usually this result obtains with a time lag from the migrants' arrival and it tends to hold even after allowance is made for the standard controls such as education qualifications.<sup>1</sup>

The typical explanation for this phenomenon relates to the nature and characteristics of economically motivated migrants. Those that tend to migrate are likely to be self-selected in a number of ways. They may be more enterprising, prepared to take higher risks, younger and possess a higher ratio of general to specific human capital than the average member of the indigenous population. This vector of characteristics is likely to be reflected in risk-taking

behaviour and in dynamism and entrepreneurship leading to higher incomes. In addition, the average return to a non-risky activity is lower than the average return to risky activity. Hence, given the assumption that migrants are less risk averse than the indigenous population, they will experience a higher average income combined, though with greater income variance.

By shifting the focus of analysis from the vector of characteristics to the structure of incentives this paper offers an alternative explanation for the migrants' high mean income. This explanation is based on a definitional distinguishing characteristic of migrants vis-à-vis the native-born viz., the strictly positive probability of return migration. Migrants may enter and work in the host country illegally or legally. Clearly, illegal participation in the host country's labour force can terminate migration.

(Consider the status of many illegal migrants in the U.S. at the wake of the 1986 Immigration Reform and Control Act). But it is easy to see why legal presence does not preclude return migration either. When the downswing of a business cycle hits hard, migrants are often induced, requested, and even pressured to return to their home country. The recent European experience is a case in point. (For example, under West Germany's Repatriation Assistance Act of 1984, some 188,000 Turks returned home (OECD, 1987)). Moreover, the

probability of return migration may be built into the migration process purely endogenously; change in the status of assets left behind or cumulative psychological pressure arising from prolonged absence from home, to give but two examples, could compel return. Such considerations do not apply to natives.

Clearly, the probability of return migration may be small, possibly even very small, and therefore it might be argued, informally, that its effect in the case of migrants vis-à-vis its lack of impact in the case of the native-born cannot possibly account for much observed variation. Not so. There are good examples of how infinitesimal probabilities of large penalties (or payoffs) impinge upon behaviour quite dramatically. Couples with children often fly on separate planes to avoid the possibility that both parents will die in an airplane accident; many people undertake extraordinary measures to avoid contacts with those with AIDS. Mirrlees (1974) and Malcomson (1986) have demonstrated that placing a very high penalty with a very low probability on deviations from a desirable action enables a principal to ensure that it is never worthwhile for agents to diverge from that action. In our context, even a very small return probability entailing a large decline in wage rates could suffice to place a wedge between the saving behaviour of migrants and the native born. As higher savings translate into higher

non-wage income, otherwise similar workers, that is, workers earning the same wage, will not have equal incomes. Migrants will outperform comparable native-born.

## II. The Economy

Consider a perfectly competitive world in which economic activity is extended over infinite discrete time. The world is characterized by overlapping generations.<sup>2</sup> In every period a single consumption good is produced using capital and labour in the production process. The endowment of labour is exogenously given whereas the endowment of capital is the output produced but not consumed in the preceding period.<sup>3</sup> Capital is perfectly mobile across countries and the rate of return to capital is at a stationary positive level,  $r^*$ , in terms of the consumption good.

Consider an economy that operates in the described world. In every time period the labour force in the economy consists of natives as well as migrants; the cause of migration is an international wage differential. The economy's stock of capital equals the output produced but not consumed in the preceding period, in addition to the net international borrowing.

### A. Production

Production occurs within a period according to a constant returns to scale production function which is

invariant throughout time. The output produced at time  $t$ ,  $Y_t$ , is

$$Y_t = F(K_t, L_t) = L_t f(k_t); \quad k_t = K_t/L_t, \quad (1)$$

where  $K_t$  and  $L_t$  are the capital and labour employed at time  $t$ , respectively. The production function is concave;

$$f'(k_t) > 0, \quad f''(k_t) < 0, \quad \lim_{k_t \rightarrow 0} f(k_t) = \lim_{k_t \rightarrow \infty} f'(k_t) = 0 \text{ and} \\ \lim_{k_t \rightarrow 0} f'(k_t) = \infty.$$

Producers operate in a perfectly competitive environment. The inverse demand for factors of production is therefore given by the first order conditions for profit maximization

$$r_t = f'(k_t); \quad (2)$$

$$w_t = f(k_t) - f'(k_t)k_t. \quad (3)$$

where  $w_t$  and  $r_t$  are the wage rate and the rate of return on capital, respectively, at time  $t$ . Output is the numeraire.

### **B. Equilibrium Prices**

Given the unrestricted nature of international lending and borrowing, the interest rate in the economy is exogenously given at the world level,  $r^*$ . Consequently, the capital-labour ratio employed in production is stationary at a level  $k^*$ ,

$$k^* = f'^{-1}(r^*), \quad (4)$$

and the wage rate is stationary at a level  $w^*$ ,

$$w^* = f(k^*) - f'(k^*)k^*. \quad (5)$$

### C. The Individuals

In every time period a new generation joins the labour force. A generation consists of two types of homogeneous groups of individuals: migrants,  $m$ , and the native-born,  $n$ . Migrants as well as the native-born are identical within and across generations. Individuals live for two periods. They are characterized by their intertemporal utility function  $U(c_1, c_2)$  defined over first and second period consumption, as well as by their unit-endowment of labour in both periods.

$$u(c_1, c_2) = u(c_1) + \delta u(c_2) \quad (6)$$

where  $\delta$  is the rate of time preference. The utility function is strictly concave and satisfies the expected utility properties;  $u'(c_j) > 0$ ,  $u''(c_j) < 0$ , and  $\lim_{c_j \rightarrow 0} u'(c_j) = \infty$  for  $c_j \geq 0$ ,  $j=1,2$ .

In the first period of their life individuals supply their unit-endowments of labour inelastically and divide the resulting income between first period consumption and savings so as to maximize their intertemporal utility function. In the second period individuals supply their unit-endowments of



labour inelastically utilizing all their labour income, in addition to the return to their savings, for consumption.

As already pointed out, the economy's labour force consists of two types of homogeneous groups of individuals: migrants and native-born. Migrants differ from the native-born in a single respect. They face a positive probability,  $(1-\alpha)$ , of returning to their home country in the second period of their life and thus of earning a lower wage rate  $w_0 < w^*$ .<sup>4</sup>

First period consumption of individual  $i$ ,  $c_1^i$ ,  $i = m, n$  is

$$c_1^i = w^* - s^i, \quad (7)$$

where  $s^i$  are the savings of individual  $i$ . Second period consumption of individual  $i$ ,  $c_2^i$ ,  $i = m, n$  is therefore

$$c_2^i = \begin{cases} w^* + r^* s^i & \text{with probability } \alpha^i \\ w_0 + r^* s^i & \text{with probability } (1-\alpha^i) \end{cases} \quad (8)$$

where  $\alpha^m = \alpha$  and  $\alpha^n = 0$ .<sup>5</sup>

The maximization problem of individual  $i$  is therefore

$$\begin{aligned} & \text{Max } u(w^* - s^i) + \delta[\alpha^i u(w^* + r^* s^i) + (1 - \alpha^i) u(w_0 + r^* s^i)] \\ & \text{subject to:} \end{aligned} \quad (9)$$

$$s^i \geq 0.$$

The optimal level of savings for individual,  $i$ ,  $s^{i*}$ , is therefore given by the following first order condition:

$$r^* \delta[\alpha^i u'(w^* + r^* s^{i*}) + (1 - \alpha^i) u'(w_0 + r^* s^{i*})] = u'(w^* - s^{i*}) \quad (10)$$

### III. Saving Patterns: Migrants versus the Native-Born

#### Proposition 1:

The higher the probability of return migration the higher the level of savings.

#### Proof:

Using the implicit function theorem it follows from (10) that

$$\frac{ds^{m*}}{d\alpha} = - \frac{r^* \delta [u'(w^* + r^* s^{m*}) - u'(w_0 + r^* s^{m*})]}{u''(w^* - s^{m*}) + \delta r^{*2} [\alpha u''(w^* + r^* s^{m*}) + (1 - \alpha) u''(w_0 + r^* s^{m*})]} < 0. \quad (11)$$

The proposition is therefore established. ||

#### Corrolary 1:

As a consequence of the possibility of return migration, migrants save more than the native-born.

## Corrolary 2:

If return migration does not materialize, migrant's wealth outweighs the wealth of the native-born.

## V. Concluding Remarks

This paper establishes a formal link between the likelihood of return migration and saving behaviour. It thus can provide an explanation for the performance of migrants relative to native-born. It is shown that given the possibility of return migration, migrants save more than the native-born. If return migration does not materialize, migrants outperform the native-born.

Note that as an aside, the analysis also indicates that migrants' contribution to capital formation in the receiving economy is higher than that of comparable native-born. Consequently, in a world where capital is not perfectly mobile across countries, if this latter contribution is considered by the host country to constitute a valuable attribute of migration, it pays that country to devise measures that prevent the return probability from falling to zero. Notice, however, that migrants who anticipate a positive return probability may transfer some of their savings as remittances to families and household members who stay behind in the sending country. By entailing a lower wealth accumulation such a leakage could result in a lower

income differential between migrants and the native-born or even in a reversal of the differential. Hence, the variance in remittance propensities across migrants from different sending countries could account for the different degrees by which different groups of migrants out-perform the native-born.

## NOTES

<sup>1</sup> For recent studies pertaining to the difference between the economic success of migrants and that of natives see, for the U.S., Chiswick (1986) and, for Canada, Bloom and Gunderson (1987).

<sup>2</sup> The overlapping-generations model used here is along the lines of the pioneering models of Samuelson (1958) and Diamond (1965). For the general advantage of overlapping-generations models see Cass and Shell (1980).

<sup>3</sup> Capital is fully depreciated after one period. Clearly, any rate of depreciation of capital can be accommodated without altering the analysis.

<sup>4</sup> Despite the absence of international differences in interest rates, wage rates may differ if production technologies differ across countries thereby giving rise to incentives for international labour migration. The patterns of labour migration in a dynamic world characterized by international differences in production technologies are analysed in Galor and Stark (1987).

<sup>5</sup> Note that since capital is fully depreciated, the non-wage income in the second period is  $r^*s^i$ . If capital were perfectly durable, the non-wage component in the second period income would be  $(1+r^*)s^i$ . However, as pointed out in note 3, any rate of capital depreciation can be incorporated without altering the results.

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