

Stark, Oded; Wang, You Qiang

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Reihe Ökonomie  
Economics Series

# Migration Dynamics

Oded Stark, You Qiang Wang

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Oded Stark, You Qiang Wang

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Institut für Höhere Studien (IHS), Wien  
Institute for Advanced Studies, Vienna

**Contact:**

Oded Stark  
Department of Economics  
University of Oslo  
P.O. Box 1095 Blindern  
N-0317 Oslo, NORWAY  
and  
University of Vienna

You Qiang Wang  
Department of Economics  
The Chinese University of Hong Kong  
Shatin, N.T., Hong Kong

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Founded in 1963 by two prominent Austrians living in exile – the sociologist Paul F. Lazarsfeld and the economist Oskar Morgenstern – with the financial support from the Ford Foundation, the Austrian Federal Ministry of Education and the City of Vienna, the Institute for Advanced Studies (IHS) is the first institution for postgraduate education and research in economics and the social sciences in Austria. The **Economics Series** presents research done at the Department of Economics and Finance and aims to share “work in progress” in a timely way before formal publication. As usual, authors bear full responsibility for the content of their contributions.

Das Institut für Höhere Studien (IHS) wurde im Jahr 1963 von zwei prominenten Exilösterreichern – dem Soziologen Paul F. Lazarsfeld und dem Ökonomen Oskar Morgenstern – mit Hilfe der Ford-Stiftung, des Österreichischen Bundesministeriums für Unterricht und der Stadt Wien gegründet und ist somit die erste nachuniversitäre Lehr- und Forschungsstätte für die Sozial- und Wirtschaftswissenschaften in Österreich. Die **Reihe Ökonomie** bietet Einblick in die Forschungsarbeit der Abteilung für Ökonomie und Finanzwirtschaft und verfolgt das Ziel, abteilungsinterne Diskussionsbeiträge einer breiteren fachinternen Öffentlichkeit zugänglich zu machen. Die inhaltliche Verantwortung für die veröffentlichten Beiträge liegt bei den Autoren und Autorinnen.

## **Abstract**

Quite often established migrants offer assistance and support that facilitate the arrival of new migrants. Why would migrants want other migrants to join them – so much so as to be willing to pay for them to come? We suggest a rationale. Our modeling framework is capable of explaining several stylized facts pertaining to transfers by migrants and the structure and dynamics of migration.

## **Keywords**

Migration dynamics; Migrants' transfers; Follow-up migration

## **JEL Classifications**

F22; J61

**Comments**

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## 1. Introduction

One of the most thoroughly documented stylized facts pertaining to the process of migration is that new migrants are assisted by established migrants. Indeed, the information transmitted and the support provided by family and friends is critical to subsequent migration; absent the support, follow-up migration will not take place. The picture that emerges is that migration by high-skill migrants prompts migration by low-skill migrants (rather than the other way around). The latter's migration is attributed to the assistance provided by high-skill fellow migrants (Lucas, 1997). What is the underlying rationale for this behavior? Even though it is not hard to understand why individuals *accept* assistance that facilitates migration, what prompts individuals to offer assistance? Why would established high-skill migrants provide assistance to low-skill workers to follow in their steps? Although the motives that underlie transfers by migrants to those who stay behind have been studied closely (Stark, 1993, 1999; Lucas 1997), the analytics of migrants' transfers to others to subsidize their ability to migrate has not. We propose – and model – an explanation for this decision.

A large number of studies have sought to document the role and prevalence of the “family and friends effect” in prompting follow-up migration. The thrust of these studies is the observation that the provision of assistance can be captured by the supply of assistance which, in turn, can be measured by the stock of past migrants. “Students of historical migration between Europe and the United States have long recognized ... that the concentration of particular nationality groups in certain cities or regions dramatically increases the probability that other members of the same group will migrate there. Whenever the number of prior migrants has been included as a regressor in aggregate models of migration flows, analysts have found that it strongly predicts the rate of migration to the country, region, or city in question.” Studies that analyze recent migration to the United States show that, *controlling* for a large array of variables that portray the economic environment of destinations (including the destination's per capita income), the size of the migrant stock is a strong predictor of migration from different countries and nationality groups. (See Massey et al. (1994) and the many references cited therein.)<sup>1</sup>

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<sup>1</sup> Given that in its early stages, migration is typically positively selective with respect to the productive labor-market characteristics of migrants, the manner in which a migration stock forms in terms of skills is from the top down (rather than from the bottom up).

Since, notwithstanding the incorporation of various controls, a stock of migrants could possibly influence the incidence of additional migration through channels other than the provision of assistance from established migrants to the new arrivals, it is useful to supplement the evidence alluded to above with a concrete example that directly documents the provision of assistance.

A particularly potent manner in which established migrants can support additional migration is to arrange jobs. A study (Meng, 2000) based on a survey conducted in 1995 of 1,500 migrants in Jinan, China reveals that not only did 81 percent of the migrants to Jinan find out from “relatives and friends” what job opportunities awaited them, but also that 71 percent of them moved into jobs that were apparently “pre-arranged” for them by established migrants. Indeed, the new migrants preferred Jinan to Guangdong in spite of the fact that wage rates in Guangdong were “much higher than in any other part of China.” Guangdong did not offer the pull effect of an established migrants’ pool.

## 2. Analysis

Let  $S$  be a migrant skill level and let there be two skill levels, high and low. Without loss of generality, let  $S = 1$  for high skill and  $S = 0$  for low skill. Let  $t$  be time,  $H_t$  the number of high-skill migrants at time  $t$ , and  $\tilde{L}_t$  the number of low-skill migrants at time  $t$ . Let  $A_t$  be the average skill level of the group of migrants at time  $t$ , and let  $W_t(S)$  be the wage of a migrant worker of skill  $S$  at time  $t$ , where

$$W_t(S) = k(H_t) \left( \frac{S}{A_t} \right)^a \quad 0 < a < 1$$

such that  $k'(H_t) = \frac{dk(H_t)}{dH_t} > 0$ , and  $k(1) > 1$ . This wage function incorporates two

considerations: a skill spillover effect and a skill separation effect. The skill spillover effect, embodied in  $k(H_t)$ , represents the idea that working with a larger group of high-skill workers raises the productivity and thereby the wage of a high-skill worker. The skill separation effect, embodied in  $\left( \frac{S}{A_t} \right)^a$ , captures the consideration that working with a larger

group of low-skill workers distinguishes a high-skill worker more forcefully and renders his skills relatively more scarce and more valuable, thereby raising his wage.

To incorporate the idea that initially migration is positively selective with respect to labor market characteristics, we assume that only the high-skill workers migrate and that the resulting wage of every high-skill migrant,  $W_t(1) = k(H_t)$ , is higher than it would have been at origin.<sup>2</sup> Given the wage function, if a low-skill worker were to migrate, his wage would be  $W_t(0) = 0$ . Let us assume that a low-skill worker migrates only if he receives one unit of income. (The wage at origin of a low-skill worker must then be between 0 and 1.) The question of interest is whether the high-skill workers will want low-skill workers to join them so much as to be willing to subsidize their migration.

Let  $L_t$  be the number of low-skill migrant workers who are supported by one high skill migrant. Since each low-skill worker receives a transfer of one unit of income, the net income of a high-skill migrant worker becomes

$$Y_t = W_t(S = 1) - Transfers = k(H_t) \left( \frac{1}{A_t} \right)^a - L_t \cdot 1.$$

When a high-skill migrant subsidizes entry by  $L_t$  low-skill migrants, then, given the number of low-skill migrants subsidized by each of the other high-skill migrants,  $L_t^*$ ,

$$A_t = \frac{H_t}{1 + L_t + (H_t - 1) + (H_t - 1)L_t^*}$$

and therefore,

$$Y_t = k(H_t) \left( \frac{L_t + H_t + (H_t - 1)L_t^*}{H_t} \right)^a - L_t.$$

Since

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<sup>2</sup> Positive selectivity implies that the skill level of the migrants is higher than the skill level of the workers who stay behind. We refer to the migrants as high skill, to the nonmigrants as low skill and, without loss of generality, endow the former with skill level  $S = 1$  and the latter with skill level  $S = 0$ .

$$\frac{dY_t}{dL_t} = \mathbf{a} k(H_t) \left( \frac{L_t + H_t + (H_t - 1)L_t^*}{H_t} \right)^{\mathbf{a}-1} \cdot \frac{1}{H_t} - 1,$$

the first order condition gives

$$\left( \frac{L_t + H_t + (H_t - 1)L_t^*}{H_t} \right)^{\mathbf{a}-1} = \frac{H_t}{\mathbf{a} k(H_t)}$$

or

$$\frac{L_t + H_t + (H_t - 1)L_t^*}{H_t} = \left( \frac{\mathbf{a} k(H_t)}{H_t} \right)^{\frac{1}{1-\mathbf{a}}}.$$

Since, in equilibrium,  $L_t = L_t^*$ , we have that

$$\frac{H_t + H_t L_t}{H_t} = \left( \frac{\mathbf{a} k(H_t)}{H_t} \right)^{\frac{1}{1-\mathbf{a}}}, \text{ that is,}$$

$$L_t = L_t^* = \left( \frac{\mathbf{a} k(H_t)}{H_t} \right)^{\frac{1}{1-\mathbf{a}}} - 1.$$

The positive transfer condition implies that

$$\left. \frac{dY_t}{dL_t} \right|_{L_t = L_t^*} > 0$$

which holds if and only if  $\mathbf{a} k(H_t) > H_t$ . Since  $\frac{dk(H_t)}{dH_t} > 0$ , we assume that this inequality

indeed holds. In addition, since  $\left. \frac{dY_t}{dL_t} \right|_{\text{very large } L_t, L_t^*} < 0$ , it follows that  $L_t = L_t^* > 0$ ; it is

*optimal* for each high-skill migrant to support or subsidize the migration of  $L_t$  low-skill workers, to make *positive* transfers in order to induce such migration. The reason then that high-skill migrants make transfers is that the transfers raise their income net of the transfers above what it would have been absent the transfers.

We have assumed, without reasoning, a skill heterogeneity of workers. We have also assumed that skill formation precedes migration, and that skills remain intact following migration. We explain the first assumption and relax the second. Workers differ in their innate abilities. By time  $t$ , workers with high innate abilities have acquired high skills while the skills of the other workers remain low. Given the technology that governs the formation of human capital in the country of origin, and given the production technology cum the manner in which low-skill and high-skill workers are employed in the home country, it may very well be the case that low-skill workers *in the home country* are unable to escape their skill predicament. Not so however upon migration. Suppose that by working jointly with high-skill workers in the host country, low-skill workers acquire high skills – an on-the-job skill formation process is in place. Consequently, by time  $t + 1$ , the  $\tilde{L}_t = H_t L_t$  low-skill migrants become high-skill migrants. Assuming that by that time the  $H_t$  migrants retire (or else die) we have that

$$H_{t+1} = H_t L_t.$$

There is now a new constituency of high-skill migrants who find it optimal to support migration by low-skill migrants. Provided the supply of low-skill workers at origin is sufficiently large, a sequence of migratory moves ensues. The forces that induce a chain of migratory moves are built into the initial migration (as if a migration multiplier is in place). This is in congruence with a large empirical literature that views migration as a process rather than as an event and that perceives migration as spanning over a sequence of “cohorts” rather than being exhausted by the responses of members of a single “cohort.”

The migration process can expand or converge and our model allows for both possibilities. If  $L_t = L_t^* > 1$ , the migration process will consistently expand while if  $L_t < 1$ , the process will dwindle. Even in this case, if the smallest possible number of migrants is 1, the process will continue for a good while – indeed for as many as  $n$  periods where  $n$  is implicitly given by the condition  $[H_t L_t L_{t+1} \dots L_{t+n-1}] = 1$ .

We see that the number of low-skill migrants depends on the number of high-skill migrants; that the reason high-skill migrants make transfers is that transfers raise their income net of the transfers; that it is *optimal* for high-skill migrant workers to support or subsidize migration by low-skill workers; and that low-skill workers cannot migrate unless high-skill workers migrate.

### 3. Concluding remarks

An interesting policy implication is that admitting some migrants (for example, high-skill migrants) creates a constituency that favors migration by others (low-skill migrants), and that this support arises not (only) from possible political reasons but (also) from economic considerations.

In earlier work (Stark, 1999) we argued that migrants may wish others *not* to follow in their steps, so much so as to be willing to pay them to stay put. In a nutshell, the basic idea in that work is as follows: when information pertaining to individual skill levels of migrant workers is unknown to employers at destination, all migrant workers receive a wage based on the average product of the group of migrants. Since high-skill workers would benefit from dissuading low-skill workers from migrating, they should be willing to make a transfer to the low-skill workers to induce them to stay put. The conditions under which such transfers are made were spelled out and their precise magnitude was determined. Migrants thus remit to nonmigrants motivated not by altruistic considerations but rather by pure self-interest: remittances protect the wage of the high-skill workers from being “contaminated” by the presence of the low-skill workers in the same pool. The idea advanced in the present note can be seen as the dual of the “strategic remittances” idea. In some contexts high-skill migrants benefit from the skill purity of the pool of migrants. In other cases high-skill migrants draw benefits from a skill dilution of the pool.

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