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Migration networks as a response to financial constraints: Onset, and endogenous dynamics ☆

Oded Stark [a,b,c,d,e,*], Marcin Jakubek [b]

[a] University of Bonn, Germany
[b] University of Klagenfurt, Austria
[c] University of Vienna, Austria
[d] Warsaw University, Poland
[e] Warsaw School of Economics, Poland

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ABSTRACT

A migration network is modeled as a mutually beneficial cooperative agreement between financially-constrained individuals who seek to finance and expedite their migration. The cooperation agreement creates a network: "established" migrants contract to support the subsequent migration of others in exchange for receiving support themselves. When the model is expanded to study cooperation between more than two migrants, it emerges that there is a finite optimal size of the migration network. Consequently, would-be migrants in the sending country will form a multitude of networks, rather than a single grand network.

1. Introduction

Migration in general, and migration in developing countries in particular, is rarely an isolated event, and is nearly always a sequence of moves – a process in which earlier migrants shape the migration infrastructure of today's would-be migrants. The intertemporal linkages can and often do assume the form of a migration network. In this paper we develop the idea that the phased nature of migration is caused by the endogenous dynamics of the operation of migration networks, and that a migration network evolves as a response to financial constraints. Specifically, we model a migration network as an arrangement between financially-constrained individuals who, in a manner akin to the functioning of a Rotating Savings and Credit Association (ROSCA), seek to finance and expedite their migration. Thus, we combine two strands of the literature, allowing us to view a migration network as an informal financial cooperation scheme that spans time and space.

Research on networks as facilitators of migration has shown that network-type links account for a single migration turning into a migration process, as would-be migrants tread the path chartered by others. Myrdal (1957) drew attention to the power and role of *cumulative causation* – the self-perpetuating interplay between networks that encourages additional migration, which, in turn, reinforces the network itself, causing it to grow and become more efficient in helping other would-be migrants. Taylor (1986) shows that networks play a crucial role in the evolution of migration, especially in the dynamics of international migration, where migration risks are highest, labor market information is most costly and scarce, and the penalty for making bad forecasts is most severe. Networks influence both the direction and the magnitude of migration over time. The network effect is strongest when a member of a single village household establishes himself at a

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* Correspondence to: ZEF, University of Bonn, Walter-Flex-Strasse 3, D-53113 Bonn, Germany.
E-mail address: ostark@uni-bonn.de (O. Stark).

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particular destination, and less strong when those concerned come from other village households. Massey (1990) notes that the social capital of migrant networks lowers the costs and risks associated with migration, thereby raising the net benefit from migration. A large body of empirical work shows that the cross-border links that migration networks provide have a significant positive impact on the intensity (rate) of migration (Davis and Winters, 2001; Dolfin and Genicot, 2010). Orrenius and Zavodny (2005) find that the likelihood of a young Mexican male migrating to the U.S. is positively correlated with his father having migrated and with the number of siblings who have migrated. Hanson and McIntosh (2010) document how, to some extent, networks act as substitutes for a wage differential in moving the migration flow between Mexico and the U.S. in the period 1960 to 2000. Beaman (2012) looks at how within-network competition for job information could weaken the effectiveness of a network as a device that overcomes labor market imperfection, and assesses the relationship between the size of the network and its effectiveness. Although the empirical context of her work (refugees in the U.S.) is distinct from ours, the perspectives of her research, namely the inner composition of the network and its optimal size, are akin to ours. Massey (1990) defines migration networks as "sets of interpersonal ties that link migrants, former migrants, and nonmigrants in origin and destination areas by the bonds of kinship, friendship, and shared community origin." We model the intensity of interpersonal bonds (affinity) and we identify the precise role that such bonds play in the design of a network.

Often, the support provided by the "network" is critical to subsequent migration; without that support, follow-up migration will not take place. What is the underlying rationale for providing support? Even though it is not hard to see why would-be migrants *accept* assistance from established migrants, what prompts the latter to *provide* assistance? And could it be that the first act in establishing a "network" actually takes place at origin rather than at destination?

Given the role that networks play, it is somewhat surprising that there has been no formal economic theory of migration networks. In this paper we take a step towards correcting this lacuna. We ask: why are migration networks formed? In what circumstances are networks more likely to emerge or evolve? Under what conditions will individuals join networks? What benefit does belonging to a network confer compared with "going it alone?" What determines the (optimal) size of a network? What constrains this size?

We model migration network as a form of cooperation between financially-constrained would-be migrants aimed at shortening the time required to accumulate the resources needed to pay for the cost of migration and initial settlement in the country of destination.[1] Seen this way, a migration network is a mutually beneficial cooperative arrangement between financially-constrained, utility-maximizing individuals, an implementation of an exchange arrangement that binds individuals across the sending and receiving countries and over time. This perspective complements the view of migration networks as conveyors of information, especially about job opportunities, and as suppliers of a variety of types of support with which established migrants furnish would-be and newly-arriving migrants.[2] Moreover, in the received literature, the emergence and formation of migration networks are typically not explained; rather, their role is highlighted. For example, Hanson and McIntosh (2010) refer to networks as "pre-existing" or "historical," and Carrington et al. (1996) relate to migrant networks as "self-perpetuating." Our charge in this paper is to explain the very formation, design, and rationale of a "network plan" even before the very first migrant has embarked on his voyage.

Just as a ROSCA is a means to overcome the lack of access to credit that is needed to facilitate and expedite the purchase of a costly good in one's locale, migration network is an informal group-saving scheme aimed at facilitating and expediting access to a rewarding yet costly employment opportunity in a location farther afield. However, migration networks have an important feature distinct from the mechanisms of ROSCA as presented, for example, by Besley et al. (1993), and Anderson et al. (2009). Namely, the enforcement of future payments from a member of ROSCA who has won "the pot" early on depends on the threat of social and material sanctions that other members are capable to impose. In sustaining a ROSCA, a crucial factor is the physical and regular proximity of the members, a feature that is absent in the context of migration. Put differently, whereas the study of ROSCA is of a mechanism for arranging finances across time, the study of migration network as a "dynamic" ROSCA is of a device for financing gainful activity both across time and across space. Space matters because transactions are not seen by all members at subsequent "meetings" (in each "meeting," the number of members who are away increases by one), and "collecting" from members who are far away is qualitatively distinct from collecting from members nearby; direct and immediate enforcement devices available in the latter case are not available in the former, for example. Put somewhat crudely, in the spectrum spanned by the polar cases of spot exchanges and sequential exchanges, the standard ROSCAs are placed significantly to the left of migration networks as dynamic ROSCAs.

We present a setting in which in terms of utility-measured gains and opportunity costs, a cooperation agreement will be preferred to "going it alone." We show that the agreement creates a network in which "established" migrants contract to support the subsequent migration of others in exchange for being supported themselves, and that the optimal size of the network (the number of the cooperating migrants) is finite.

Perceiving migration networks as mechanisms geared at financing and expediting migration is not the only way of thinking about networks as a means of supporting and facilitating follow-up migration. In earlier writings, we alluded to other variables and mechanisms that explain why "established" migrants provide support for the follow-up migration of others. These variables and mechanisms include: altruism (Stark, 1999); the building up of a community of migrants to constitute a reference group that will constrain the relative deprivation that would otherwise be felt through unavoidable comparisons with the "natives" (Fan and Stark, 2007); wage gains (Stark and Wang, 2002); and the formation of a political constituency (Stark, 1993). We also considered the support given to others as a means of building up the individual's reputation in the home community so as to cushion his return (Lucas and Stark, 1985), although here we develop an argument premised on permanent migration. The present perspective of networks adds to the received literature in a number of concrete ways: it identifies a new rationale, both from the perspective of established migrants and from the perspective of would-be migrants, for the prevalence of a network; it considers membership in a network as a choice variable in an explicit optimization process; it yields a precise prediction as to the timing and sequencing of migratory moves by members of the network; it determines the optimal size (membership) of the network; it establishes a link between the magnitude of remittances and the cost of migration, and explicates the varying intensity of remittances over time; and it explains a large number of stylized facts that were hitherto subject to a plethora of theories.

Before proceeding, we summarize the migration characteristics and stylized facts that we seek to explain:[3]

- Migration is phased; migrants arrive at destination sequentially, not simultaneously.
- Would-be migrants receive assistance from past migrants; past migrants provide assistance to would-be migrants.

[1] There is a perception in the migration literature that the cost of migration to the n-th individual, including the cost of getting established at destination, is not independent of the presence at destination of past $n-1$ migrants. The standard argument in the received literature (cf., for example, Carrington et al., 1996) is that the cost decreases in $n-1$. But this is not what interests us. We study the case in which the overall cost is *given*, and we show how cost sharing is arranged such that established migrants bear part of the cost.

[2] See, for example, Banerjee (1983), Massey et al. (1987), and Munshi (2003).

[3] Several of the listed stylized facts are elicited from Stark (1993), Rosenzweig and Stark (1997), and Stark (2009).