

MIGRATION, INSTITUTIONS AND DEVELOPMENT

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Abstract

This survey examines the relationship between community networks and migration. Adding networks to the Roy model, the workhorse model of migration in economics, is shown to reconcile key stylized facts on migration with the theory. This addition is supported by a voluminous literature, cutting across the social sciences, that documents the role played by community networks in major migration events. While migrant networks may support mobility in the short-run, they can have negative long-term consequences, locking their members into particular locations and occupations at the destination over many generations. The survey covers both the positive and the negative aspects of community networks, concluding with suggestions for future research.

Keywords. Community networks. Migration. Networks and economic efficiency. Mobility.

JEL . D02. J61. J62. L14. O12. O17

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1 Introduction

Mobility is central to the process of development. There is limited occupational and spatial mobility in the pre-modern economy. The distinguishing feature of a developing economy is that opportunities arise for individuals to move from the village to centers of industrial production. One constraint to mobility is that potential migrants often are unaware of jobs that are available in the city. Urban employers, in turn, are discouraged from hiring migrants with unknown traits and characteristics. Additional constraints to migration include inadequate infrastructure, government safety nets in the city, and private credit.

While much progress has been made in understanding these constraints to mobility, and development more generally, the reality in all developing countries is that migration does occur. However, the bulk of this migration is accounted for by a relatively small number of pre-existing communities at the origin, which are defined by kinship (caste, clan, or tribe) or geography (neighborhood, village, or hometown). A wealth of anecdotal evidence from across the world, discussed below, indicates that these communities have historically supported the mobility of their members by solving information and enforcement problems in destination labor markets and by providing them with credit and other forms of mutual assistance. The available evidence indicates these communities continue to play this supportive role in the contemporary economy when required, and it is thus quite striking that we know so little about the intra-group cooperation that underlies this role.

This is not to say that economists have completely ignored cooperation within pre-existing social groups. Greif's (1993) analysis of the Maghribi traders' coalition and Greif, Milgrom, and Weingast's (1994) investigation of the medieval merchant guild highlight the role played by non-market institutions in solving commitment problems in the pre-modern economy. In contemporary economies where private market credit and government safety nets are absent, a voluminous literature documents extremely high levels of risk-sharing in informal community-based mutual insurance arrangements throughout the world; e.g. Townsend 1994, Grimard 1997, Fafchamps and Lund 2003, Angelucci, Di Giorgi, and Rasul 2015. Statistical analyses of the role played by communities in supporting migration, however, are relatively limited. In particular, we know very little about why some population groups or communities were able to cooperate and collectively transform their circumstances, in the face of numerous economic and bureaucratic obstacles, while many others were not.

The objective of this survey article is to review the economics literature on migration, with a par-

ticular focus on the community aspect of migration, and, based on this review, to highlight areas for future research. Section 2 presents a stripped down version of the Roy model, the workhorse model of individual decision-making in the migration literature. This model does a poor job of predicting bilateral migration flows between countries or regions and in explaining observed patterns of migrant selection. I show in Section 3 that these deficiencies can be rectified by adding community networks to the Roy model. This section includes a brief review of the voluminous literature in the social sciences on community-based migration, which provides empirical justification for the augmented Roy model. Section 4 completes the review of the literature by shifting focus to the long-term consequences of community-based migration; the same networks that support migration initially can restrict occupational and spatial mobility in later generations once they are established at the destination. The augmented Roy model from Section 3 provides a simple economic explanation for this phenomenon. Section 5 lists and discusses unanswered research questions that emerge from the literature review and Section 6 concludes.

2 The Migration Decision

The workhorse model of migration in economics, due to Roy (1951), predicates the individual's location choice on the payoff at the origin, the payoff at the destination, and the cost of moving. This model has been used extensively in empirical studies to predict migration flows between locations and patterns of migrant selection (by education). To incorporate selection, it is necessary to introduce multiple levels of education. For ease of exposition, suppose that there are two education levels: low (L) and high (H). Less educated workers are channeled into low-skill occupations, while more educated workers are channeled into high-skill occupations. The wages at the origin (O) and the destination (D) for the two types of workers are denoted by W_e^O , W_e^D , $e \in \{L, H\}$, respectively. A worker will choose to migrate if $W_e^D - c \geq W_e^O$, where the distribution of the moving cost, c , is independent of education and is characterized by the function $F(c)$.

Within each education category, individuals with moving costs below a threshold \underline{c}_e will migrate, with the fraction of migrants denoted by $F(\underline{c}_e)$. The first prediction of the Roy model is that migration is increasing in $W_e^D - W_e^O$. A large number of studies have tested this prediction, typically with OECD data; e.g. Beine et al. (2011), Bertoli and Fernandez-Huertas Moraga (2012), Docquier et al. (2014). Although wages at the origin and destination do predict bilateral flows between countries, they account

for a small part of the variation in these flows. What matters more for the origin-destination flows is the stock of migrants from the origin at the destination. Although other interpretations for this finding are available, one explanation is that the stock of migrants is a measure of the strength of the network at the destination, which, in turn, supports the additional flow of migrants. I will formalize this idea below by adding networks, and network dynamics, to the Roy model.

Because we have assumed that the distribution of moving costs is the same for both types of workers, the second prediction of the Roy model is that there will be positive selection on education if $W_H^D - W_H^O > W_L^D - W_L^O$. Rearranging terms, migrants will be positively selected on education if $W_H^D - W_L^D > W_H^O - W_L^O$; i.e. if there is greater wage inequality at the destination than the origin, as noted by Borjas (1987). As summarized by Abramitzky, Boustan, and Eriksson (2012), empirical tests from across the world find mixed support for this prediction. For example, the nature of migrant selection from Mexico to the U.S., a topic of great policy interest that has received much research attention, remains unresolved (Chiquar and Hanson 2005, Cuecuecha 2005, Orrenius and Zavodny 2005, Mishra 2007, Ibarra and Lubotsky 2007, Fernandez-Huertas Moraga 2011, 2013). The Roy model cannot, in addition, explain the dynamics of migrant selection. As documented by McKenzie and Rapoport (2007), while there is positive selection on education to begin with in the Mexican sending communities that they study, this is replaced by negative selection later in time. We will see that the results on migrant selection across different studies can once again be reconciled when community networks are added to the Roy model.

3 Community-Based Migration

A natural way to add community networks to the Roy model is to allow them to increase wages at the destination. Labor market networks tend to be concentrated in blue-collar occupations, both in developed and in developing economies. For example, Rees (1966) reports that informal sources accounted for 80% of all hires in blue-collar occupations versus 50% of all hires in white-collar occupations in an early study set in Chicago. This is because educational credentials are a good indicator of competence in white-collar occupations, but not necessarily so in blue-collar occupations. Moreover, production tends to take place in teams in these occupations, making it difficult for the firm to attribute effort or competence to individuals on the job. Networks of socially connected workers can overcome both the information and the enforcement problems that arise with team production. This is incorporated in

the theoretical framework by allowing the low-skill wage at the destination, W_L^D , to be increasing in the size of the network, which is organized around migrants from the same origin community.

Suppose that $W_H^D - W_H^O > W_L^D - W_L^O$ to begin with, before migrant networks have had a chance to form. This implies that there will be positive selection on education out of all origin communities. However, if a migrant network does form and grow over time at the destination, then the right hand side of the preceding inequality will also increase over time, ultimately resulting in a switch in its sign; positive selection is replaced by negative selection, as documented by McKenzie and Rapoport. Note, however, that this dynamic pattern of migrant selection will not be obtained in all communities; we will see momentarily that migrant networks only form when social connectedness in the population from which they are drawn exceeds a threshold level. These networks will also form at different points in time. We could thus obtain positive or negative selection on average in a sample of communities at a given point in time, depending on their population characteristics and when their destination networks formed. The Roy model with networks is thus able to generate the dynamic and the cross-sectional patterns of migrant selection that have been documented in the literature.

To understand why the Roy model, by itself, does a poor job of explaining bilateral migration flows, ignore differences in education and focus, instead, on the network dynamics. There is a continuum of potential migrants of unit mass from each community in each period. Wages at the origin are denoted by W^O . Wages at the destination in period t are determined by the stock of migrants from the community who are already settled there: $W_t^D = \beta \sum_{\tau=0}^{t-1} c_\tau$, where c_τ is the flow of migrants in period τ and β maps network size into wages. β is increasing in the social connectedness of the origin population from which the destination network is drawn; the implicit assumption here is that networks formed from a more connected population will themselves be more connected and, therefore, more effective.

Individuals bear a cost $c \sim U[0, 1]$ when they move. In any period t , individuals with moving costs below a threshold $c_t = \beta \sum_{\tau=0}^{t-1} c_\tau - W^O$ will thus migrate to the destination. To initiate the network dynamics, c_0 individuals are moved exogenously to the destination in period 0 from each community. As in Munshi (2011), we can then solve recursively to derive a closed-form solution for the flow of migrants in each period t : $c_t = (1 + \beta)^{t-1}(\beta c_0 - W^O)$. The first point to note from this solution is that the destination network will only grow over time if $\beta c_0 > W^O$. There is thus a threshold $\underline{\beta}$ above which migrant networks will form, as documented by Chay and Munshi (2015), separately for black migration from southern counties to northern cities after World War I, and for migration from the Punjab to the U.K. after World War II. The second point to note is that the size of the network and, hence, wages are

increasing in β above the threshold at any given point in time. Standard data sets do not capture these community-specific differences and so they will do a poor job of explaining bilateral migration flows. The third point to note, once multiple destinations are introduced in the model, is that a small initial advantage at a particular destination will expand rapidly over time due to the compounding network effect. This explains the well known fact that proximate origin communities with similar characteristics can end up at very different destinations when networks are active; e.g. Carrington, Detragiache, and Vishwanath (1996), Munshi (2003). It is also another reason why the canonical Roy model, without networks, does a poor job of explaining bilateral migration flows.

Based on the preceding discussion, adding networks to the Roy model would reconcile the theory with key stylized facts in the migration literature. This addition has strong empirical support, given the vast literature in the social sciences documenting the important role played by community networks in major migration events. The development of the United States is associated with the first large-scale movement of workers across national boundaries. During the Age of Mass Migration (1850-1913), the U.S. received 30 million European immigrants. Abramitzky, Boustan, and Eriksson (2014) calculate that this resulted in 38% of workers in northern cities being foreign-born in 1910. Labor markets in the nineteenth century could be divided into three segments: a stable segment with permanent employment, an unstable segment with periodic short-term unemployment, and a marginal but highly flexible segment characterized by spells of long-term and short-term unemployment (Gordon, Edwards, and Reich 1982). Migrants being newcomers to the U.S. market typically ended up in the unstable and marginal segments, where the uncertain labor demand and the lack of information about their ability and diligence naturally provided an impetus for the formation of ethnic job networks (Conzen 1976, Hoerder 1991).

Accounts by contemporary observers and an extensive social history literature indicate that friends and kin from the origin community in Europe played an important role in securing jobs for migrants in the U.S. labor market in the nineteenth century and the first quarter of the twentieth century. Early historical studies used census data, which provide occupations and country of birth, to identify ethnic clusters in particular locations and occupations (Hutchinson 1956, Gordon, Edwards, and Reich 1982). Based on the preceding discussion, such clusters arise naturally when networks are active. More recently, social historians have linked parish registers and county data in specific European sending communities to census and church records in the United States to construct the entire chain of migration from those communities as it unfolded over time (Gjerde 1985, Kamphoefner 1987, Bodnar 1985).

Migration from Europe ceased in 1913, but it was soon replaced by the movement of African-Americans from the rural South to northern cities. The first major movement of blacks out of the South commenced in 1916. Over 400,000 blacks moved to the North between 1916 and 1918, exceeding the total number who moved in the preceding 40 years. During the first phase of the Great Migration, running from 1916 to 1930, over one million blacks (one-tenth the black population of the United States) moved to northern cities (Marks 1983). This movement was driven by both pull and push factors. The increased demand for labor in the wartime economy coupled with the closing of European immigration, gave blacks new labor market opportunities (Mandle 1978, Gottlieb 1987). At the same time, adverse economic conditions in the South, together with segregation and racial violence, encouraged many blacks to leave (Marks 1989, Tolnay and Beck 1990). Although these exogenous forces may have provided the initial impetus for migration, networks linking southern communities to specific northern cities, and to neighborhoods within those cities, soon emerged (Gottlieb 1987, Marks 1991, Grossman 1989, Carrington, Detragiache, and Vishwanath 1996).

The large-scale movement of labor in the U.S., supported by migrant networks, was being replicated in other parts of the world as economies industrialized and cities grew in the nineteenth century. For example, Mumbai's industrial economy in the late nineteenth century and through the first half of the twentieth century was characterized by wide fluctuations in the demand for labor (Chandavarkar 1994). As discussed above, frequent job turnover will naturally give rise to labor market networks. The presence of such recruitment networks has indeed been documented by numerous historians studying Mumbai's economy prior to independence in 1947 (Chandavarkar 1994, Morris 1965, Burnett-Hurst 1925). These networks appear to have been organized around the jobber, a foreman who was in charge of a work gang in the mill, factory, dockyard, or construction site, and more importantly also in charge of labor recruitment.

Given the information and enforcement problems that are associated with the recruitment of short-term labor, it is not surprising that the "jobber had to lean on social connections outside his workplace such as his kinship and neighborhood connections" (Chandavarkar 1994: 107). Here the endogamous caste, or its non-Hindu equivalent, served as a natural social unit from which to recruit labor. The presence of caste clusters has been documented in Mumbai's mills (Gokhale 1957), docks (Cholia 1941), railway workshops (Burnett-Hurst 1925), and various industries (Chandavarkar 1994). Although most historical accounts of caste-based networking in Indian cities are situated prior to independence in 1947, a few studies conducted over the subsequent decades indicate that these patterns persisted over many

generations. For example, Patel (1963) found that 66% of the textile workers he surveyed in Mumbai in 1961-62 got jobs in the mills through the influence of their relatives and friends, many of whom would have belonged to the same caste. Forty years later, Munshi and Rosenzweig (2006) surveyed the parents of school children residing in the same area of the city. 68% of the fathers employed in working class occupations reported that they received help from a relative or member of their caste in finding their first job, while 44% of fathers in white-collar occupations reported such help.

Labor market networks continue to be active in cities throughout the world, most often among migrant populations. In China, networks of relatives and friends from the same hometown are believed to have played an important role in supporting the largest internal migration in history (Bian 1994, Zhang and Li 2003, Giles, Park, and Cai 2006, Wang 2013). We would expect social ties to play an especially strong role for international migrants in distant and unfamiliar destinations. Indeed, over 70% of the undocumented Mexicans in the U.S., and a slightly higher proportion of the Central Americans, that Chavez (1992) interviewed in 1986 found work through referrals from friends and relatives. Similar patterns have been found in contemporary studies of Salvadoran immigrants (Menjivar 2000), Guatemalan immigrants (Hagan 1994), and Chinese immigrants (Nee and Nee 1972, Zhou 1992) to the United States. Individual respondents in the Mexican Migration Project, which collects information on a sample of individuals from different Mexican origin communities were asked how they obtained employment on their last visit to the United States; keeping in line with a remarkably consistent pattern across time and space, relatives (35%) and friends or *paisanos* from the origin village in Mexico (35%) account for the bulk of job referrals (Massey et al. 1987).

4 Long-Term Consequences of Community-Based Migration

Community networks play an important role in destination labor markets by helping new arrivals find jobs. Incumbent workers provide referrals for competent newcomers from their community, who work diligently once they are hired to avoid the social sanctions they would face if they shirked. Social ties thus improve the outcomes of migrants, generating an accompanying increase in migrant flows and improving economic efficiency in the short-run. However, the same community networks that support movement from the origin to the destination when they first form can discourage the subsequent occupational and spatial mobility of their members once they are established. This inertia is commonly observed in heavily networked blue-collar communities that were originally established by

dynamic migrants but which, over subsequent generations, become especially resistant to change (Gans 1962, Kornblum 1974). The augmented Roy model with community networks that we have developed can be extended to provide a simple explanation for this phenomenon.

Return to the set up with two types of occupations, skilled and unskilled, and two levels of associated education, high (H) and low (L). We now consider established community networks and the choices of individuals born at the destination, so wages at the origin and moving costs can be ignored. Individuals are heterogeneous in their ability, which determines the cost of education. It costs \bar{C} for low ability individuals to attain high education, whereas the corresponding cost for high ability individuals is $\underline{C} < \bar{C}$. We normalize so that the cost of attaining low education is zero.

We continue to assume that the unskilled wage, W_L , is increasing in the (lagged) size of the community network in that occupation, but the dynamics now unfold over multiple generations. In particular, members of the community from the previous generation in the low-skill occupation provide referrals, and increase wages, for the next generation. Let $W_L(0)$ be the unskilled wage when no one from the individual's community selected that occupation in the previous period. Let $W_L(N)$ be the corresponding wage when all N members of the previous generation selected the unskilled occupation. Following Munshi and Rosenzweig (2006), if communities were concentrated entirely in either the skilled or the unskilled occupation in the initial period, then the following conditions ensure that there will be occupational persistence at the level of the community in all subsequent generations:

$$\mathbf{C1.} \quad W_H - \bar{C} > W_L(0)$$

$$\mathbf{C2.} \quad W_H - \underline{C} < W_L(N).$$

The first condition says that if the low-skill network was not active in the previous generation, then individuals of both types would invest in high education in the current generation and end up in skilled jobs. The second condition says that if everyone in the community selected into the network in the previous generation, then individuals of both types would select low education and end up in the unskilled occupation. If conditions C1 and C2 are satisfied, it follows that communities will stay in the initial equilibrium from one generation to the next, with everyone either investing or not investing in education. The Roy model with networks, where the choice is now about occupation rather than location, can explain why migrant communities can remain locked in their initial occupation for many subsequent generations.

However, economies will restructure over the course of the development process and one consequence of development is that the returns to education, and the skilled wage, will start to grow. When the inequality in condition C2 is just reversed, high ability individuals from communities that traditionally exclusively selected into the low skill occupation will invest in high education and earn ϵ more in the skilled occupation than they would have if the entire community remained in the traditional occupation. If the fraction of high ability individuals in these communities is non-negligible, then their exit from the network will result in a substantial (first-order) decline in the wage received by low ability individuals. From a utilitarian perspective, welfare will decline, providing an economic rationale for community-based restrictions on mobility.

Individuals who select out of the traditional low-skill occupation will often move to a new location at the destination. The conventional punishment mechanisms that maintain cooperation within communities will then no longer be effective. Munshi and Rosenzweig argue that an alternative strategy to maintain cooperation in that case would be to instill a strong sense of community identity in childhood, which ensures that individuals remain tied to their community in adulthood. The idea that identity, and values more generally, are purposefully instilled to further community objectives is in line with previous work on this topic in economics; e.g. Bisin and Verdier 2000, Tabellini 2008. It also explains why heavily networked blue-collar communities tend to instill an especially strong sense of identity among their members. Depending on the context, this identity can be instilled centrally by institutions such as the local church or in decentralized fashion by parents, as in Bisin-Verdier and Tabellini.

The community identity described above aligns individual choices more closely with the social optimum. While this identity may thus be welfare enhancing when it is first put in place, it can result in a dynamic inefficiency if it persists in subsequent generations past the point where W_H has grown large enough that it is socially optimal for the high ability individuals to exit. Cultural norms are persistent by design, which explains why blue-collar communities often appear to stubbornly resist change (despite the fact that the same communities were extremely dynamic when they formed). In general, community networks do a good job of supporting the mobility of groups of individuals, but are less supportive of individual mobility (Munshi and Rosenzweig 2016). A complete characterization of the relationship between community networks and migration requires attention to the tension between individual and group mobility, as well as the dynamic process through which these networks form at the destination, become established over multiple generations, and then serve as the point of departure for further mobility. The discussion that follows covers this and other areas for future research.

5 Directions for Future Research

There is a wealth of anecdotal evidence that highlights the role played by communities in supporting migration. Adding community networks to the canonical Roy model also allows us to reconcile key stylized facts in the migration literature with the theory. There is evidently a need to incorporate community networks in theoretical models of migration and empirical analyses of this phenomenon. The discussion that follows highlights three areas for future research that would help us better understand the relationship between community-based networks and migration.

Research Question 1. *Under what conditions do community-based networks supporting migration form?*

As discussed above, there is an extensive literature in sociology, anthropology, and social history documenting the role played by ethnic or hometown communities in major migration events. In parallel, the business economics literature provides many examples of the movement of communities from traditional occupations, such as farming and administration, into business; e.g. Gadgil 1959, Nafziger 1971, Damodaran 2008. This occupational mobility was typically accompanied by spatial mobility, from the village to centers of trade and industrial production. Although the literature on community-based migration is rich in detail, a general characterization of the initial conditions that trigger subsequent network growth is missing. Why are some communities, but not others, able to move *en masse* to distant locations? What forces trigger these group movements?

When deriving the network dynamics above, we simply assumed that a mass c_0 of individuals from each origin community was moved exogenously to the destination in the initial period. We then showed that the network would subsequently take off if βc_0 , where β measures social connectedness in the origin community, is sufficiently large. While this simple characterization highlights the importance of the initial shock and relevant community characteristics, network formation in reality is a much more complicated process.

For example, Munshi (2011) describes the process through which a historically disadvantaged caste in India made the transition from agricultural labor to industrial labor, cutting and polishing rough diamonds, and subsequently into the diamond business. Each occupational transition was accompanied by movement to a different location. The caste-community in question, known informally in the industry as the Kathiawaris, made its first move in the mid-1960's, when a change in foreign exchange regulations allowed the Indian diamond industry to take off. Business activity was initially controlled by two

wealthy and experienced caste-communities, the Marwaris and the Palanpuris, while the Kathiawaris moved in large numbers from their villages to provincial cities such as Surat and Navsari where cutting and polishing workshops were established.

The second occupational transition (and spatial movement) for the Kathiawaris was precipitated by the discovery of massive diamond deposits in Australia's Argyle mines in 1979. India does not produce rough diamonds and so most exporters travel to Antwerp every month or two, for a few days, to buy rough stones on supplier credit. While each exporter will establish long-term relationships with a small number of suppliers, the community network allows exporters to receive rough stones on credit from a much wider set of suppliers (with community-members having long-term relationships with those suppliers standing guarantor for them). An alternative business model for exporters is to establish a branch (and a market reputation) in Antwerp, in which case they operate simultaneously as rough suppliers and (independently of their community network) as exporters. When the supply shock hit the diamond industry in 1979, some Palanpuri businessmen had coincidentally just established branches in Antwerp. These businessmen persuaded their trusted Kathiawari labor contractors to enter business. A sufficiently large number of Kathiawaris entered at that point in time, jump-starting their network. Today there are hundreds of Kathiawari export firms based in Mumbai.

The preceding narrative describes how a confluence of favorable circumstances allowed the Kathiawari network to form and grow: (i) there was a positive shock to the world supply of rough diamonds, (ii) some Palanpuris had established branches in Antwerp and had an incentive to encourage entrants from another community, and (iii) the Palanpuri businessmen and their Kathiawari labor contractors had established long-term bilateral relations by that time. Such a favorable confluence of circumstances only arises rarely and it is important to characterize general conditions under which networks will form and grow. To achieve this objective, the first step would be to carefully document the forces at work in other such events. Although community networks are constantly forming as new opportunities for mobility arise, much of this activity lies under the surface and is difficult to predict. Opportunities for prospective empirical analyses are thus limited. A more promising approach would be to use retrospective data. This could be historical case studies using archival material or statistical analyses using retrospective survey data or historical administrative records. The key requirements are that there should be sufficient detail on the triggers that resulted in network formation, the theoretically relevant characteristics of the population from which the networks were drawn; e.g. social connectedness, and the subsequent short-run evolution of the networks (reflected in the flow of migrants). The forces that

matter will vary with the context. Studies from different contexts are thus needed to provide a comprehensive picture of the conditions under which community-based mobility is initiated, which would lead, in turn, to theoretical modelling of this phenomenon.

Research Question 2. *What is the magnitude of the role played by community networks in historical migration events?*

There is a wealth of anecdotal evidence pointing to a role for community networks in migration events across the world. In parallel, much progress has also been made in statistically identifying migrant-network effects; e.g. Munshi (2003), Woodruff and Zenteno (2007), McKenzie and Rapoport (2007, 2012), Beaman (2012). The idea that community networks support the occupational and spatial mobility of their members is no longer controversial within economics. However, the argument that these networks should be incorporated in theoretical models and empirical analyses of migration is only justified if the *magnitude* of their role is substantial, and this remains to be determined.

The studies cited above use special research designs to identify network effects. For example, Munshi uses rainfall shocks in Mexican origin communities as statistical instruments for changes in the size of migrant networks at the U.S. destination to estimate the relationship between network size and labor market outcomes. Beaman exploits quasi-random variation in refugee placement and Woodruff-Zenteno and McKenzie-Rapoport use historical variation in access to railroads in origin communities to estimate network effects. Case studies of this sort reveal that networks are active, but they are less useful in quantifying the magnitude of their role. For that, comprehensive data covering a major migration event in its entirety are needed. Administrative data are now becoming increasingly available from countries at different stages of economic development. Major efforts are also underway to digitize historical censuses. If the number of migrants and their destinations and occupations are available for each origin community over the course of an entire migration event, then the data can be used to estimate models of migration with networks and to quantify the role of these networks. The major data challenge here is to obtain community identifiers and this may require access to information that is not publicly available or has not been previously digitized.

The first step in the quantification exercise is to develop a theoretical model of migration. The augmented Roy model discussed above could serve as an appropriate starting point, although we would want to allow for multiple destinations and an individual-specific payoff at each destination (drawn from an appropriately specified distribution). If there is exogenous variation in the population characteristics

of the communities from which the networks are drawn, then the model should generate predictions for clustering at particular destinations or in particular occupations, for example, that allow us to infer with some confidence that networks are active.

The next step in the quantification exercise would be to estimate the structural parameters of the theoretical model that is developed and then predict what migration would have been without networks. This counter-factual experiment will also tell us what the distribution of migrants across space and occupations would have been if networks were absent. The potential limitation of the structural approach is that the magnitude of the network's role will only be estimated accurately if the theoretical structure that is imposed on the data is valid empirically. The validation tests discussed above are especially useful in this regard. Although structural models have been used to study the dynamics of individual migration, the proposed analysis will extend the research frontier on a different and important aspect of migration.

Research Question 3. *What inefficiencies arise in economies where community networks support mobility?*

Communities intervene in developing economies because markets function imperfectly. In this survey, we have focused on their role in supporting the movement of groups of individuals from one location to the other. Although this mobility-enhancing role for the community may increase economic efficiency, there is no substitute for well functioning markets. Like all non-market interventions, community networks inevitably generate inefficiencies of their own. The discussion that follows lists some of these inefficiencies, but this is just a partial list. A complete characterization of the static and dynamic inefficiencies that accompany community-based migration is an important area for future research.

A. Static Inefficiency. While community identity may sometimes be used to improve outcomes, as discussed above, the conventional mechanism to get self-interested individuals to cooperate within communities is the threat of social punishment. Individuals interact frequently within these communities and, typically, much less frequently across communities. Exclusion from these interactions is thus a severe punishment, which can be used to ensure that community members do not renege on their social obligations.

In the context of migration, frequent interactions between migrants belonging to a common origin community ensure high levels of cooperation at the destination. The inefficiency that arises is that this cooperation does not extend across community lines. Indeed, communities may actively discourage

cross-community interactions and trade between individual members because superior options outside the community make social sanctions less effective, resulting in lower internal cooperation. These restrictions on trade can, in turn, result in a misallocation of resources.

For example, Banerjee and Munshi (2004) show that the inability of capital to cross community lines results in a misallocation of resources in Tirupur's production cluster. Local entrepreneurs in Tirupur belong to a wealthy agricultural caste with few alternative uses for its capital. Migrant entrepreneurs, in contrast, are drawn from caste-communities with many generations of business experience; these business communities have many alternative uses for their capital. Using data from a survey of entrepreneurs that collected retrospective information on their capital investment and production, Banerjee and Munshi uncover two facts: (i) that local businessmen hold more capital stock than the outsiders, on average, at all levels of experience, and (ii) that production, nevertheless, grows faster for the outsiders at all levels of experience; they start with lower levels of production, but outstrip the locals after five years of experience. Banerjee and Munshi develop a simple model in which the entrepreneur's ability and the firm's capital stock are complementary inputs to show that the two stylized facts can only be observed simultaneously if the outsiders have higher ability on average, which is not surprising, given that they are drawn from traditional business communities, but also face a higher cost of capital (interest rate), which is once again not surprising because there are many uses for their capital. Cheap capital fails to move from the local community to the more competent outsiders, resulting in a misallocation of resources. This misallocation should not be observed within communities, where we expect that well functioning networks will ensure that all entrepreneurs face the same interest rate; and, indeed, Banerjee and Munshi find that firms holding more capital stock do grow faster (and have higher levels of production) within communities. It is only across communities that the negative correlation between capital stock and production is obtained, presumably because the outsiders cannot credibly commit to repaying the locals for the capital they receive.

Anderson (2011) documents similar restrictions on trade in groundwater between castes in North Indian villages. Trade does not occur despite the fact that these castes have been co-residing in these villages for generations, which is indicative of the extremely weak cross-caste social ties in India. The insider-outsider dichotomy is especially pronounced for migrants, as in Tirupur, because they are (by definition) newcomers to the destination market and can only establish social relations with the locals after they have been settled for a sufficient amount of time. In the initial period, they will be forced to rely on their own resources. This strengthens their own networks, accentuating the insider-outsider

dichotomy and worsening the misallocation described above. Although numerous historical accounts of migrant labor networks document their efficiency-enhancing role, finding jobs for their members, these accounts do not consider the accompanying misallocation that could arise. While networks help competent members find jobs, even more competent workers from communities with weaker networks could be shut out. This problem is exacerbated by nepotism and collusion – when strong networks enjoy monopoly power in the labor market, they will use this power to recruit relatively incompetent individuals from the community at the margin. More research is needed on this static inefficiency and the wealth inequality across communities, both in the short-run and the long-run, that arises when community networks are active.

B. Dynamic Inefficiency. When networks are active, individuals will forego their comparative advantage in particular locations or occupations to move where their community is concentrated. In the short-run, there will be too little clustering if individuals do not internalize the positive externality they provide to the rest of the community by joining the network. In the long-run, however, there could be too much clustering if individuals' payoffs grow rapidly with experience in those activities where they are best suited, but they select instead into activities where their network is concentrated. In particular, there will be a dynamic inefficiency, with too much clustering, if individual discount factors are lower than the social optimum. The latter is very likely to arise in developing economies where individuals are credit constrained.

Clustering by migrant communities in particular occupations and locations is a commonly observed phenomenon. This clustering, by itself, is not indicative of an economic inefficiency. As the preceding discussion clarifies, inefficiencies will only arise if individuals are too impatient from a social perspective when trading off current gains from the network with the long-term benefits from the activity for which they are most suited. More research, both theoretical and empirical, is needed to better understand the sources of this dynamic inefficiency and to quantify its magnitude. This work around network (group) formation would complement the other dynamic inefficiency that was previously highlighted, which arises when established migrant networks prevent their members from pursuing new opportunities. It would also complement the quantification exercise described above, where the objective was to determine the magnitude of the role played by community networks in major migration events. The quantification of the static and dynamic inefficiencies that these networks generate is an equally important area for future research, which could be implemented using similar data and with suitably

modified models of migration that incorporate these inefficiencies.

6 Conclusion

This chapter surveys the literature on migration, paying special attention to the role that communities play in this process. The canonical Roy model does a poor job of explaining key aspects of migration. This limitation can be remedied by adding networks to the Roy model, with this addition supported by a voluminous literature documenting the role played by communities in migration events throughout the world and over time. One possible reason why networks continue to be ignored in economic analyses of migration is that the *magnitude* of their role remains to be established. This is listed as one of three important areas for future research, based on the survey of the literature. The other areas are, (i) a more detailed and comprehensive examination of the conditions under which migrant networks form, and (ii) a systematic assessment of the inefficiencies associated with these networks.

Apart from these gaps in our knowledge of the role played by communities in the process of migration, there are two areas that are related to community-based migration that deserve independent attention. The first area has to do with migrant assimilation, a topic of great policy relevance. Despite its importance, we know very little about the assimilation process, both from a theoretical and from an empirical perspective. The discussion on the long-term consequences of community-based migration touched upon this topic, but assimilation is a much more complicated phenomenon. It is also a multi-generational phenomenon that is especially demanding on the data and this makes empirical research on this topic very challenging. Given how little we know about assimilation, any theoretically-grounded research on this topic would be welcome.

The second research area that is related to community-based migration is entrepreneurship. The establishment of firms and the movement of labor to centers of industrial production are key ingredients in the development process. At a fundamental level, the economic models underlying analyses of migration and entrepreneurship are the same; in one case, individuals are moving to a new location (and, typically, a new occupation), whereas in the other case, individuals are moving into a new occupation (often in a different location). Communities play a key role in supporting both migration and entrepreneurship in developing countries and so ideally these phenomena should be analyzed in a consistent framework, rather than being treated independently, as they currently are in the economics literature.

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