

# Social Interactions in Economic Models of Migration: A Review and Appraisal

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*This paper reviews economic research on labour migration which explicitly or implicitly accounts for socially mediated influences on migration choices. Both theoretical and empirical models are considered. The focus is on models analysing migration decision-making (initiation and perpetuation). The article also considers how economics accounts for non-market interactions related to settlement decisions, duration of stay, and labour market assimilation. Previous surveys have comprehensively reviewed the modelling of both migration behaviour and effects in economic theory. This paper focuses upon efforts to meld concepts traditionally pursued separately in economics and sociology into formal economic models.*

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## Introduction

The empirical puzzle challenging migration research in economics is the observation of labour migration patterns which are often inconsistent with the predictions of neoclassical models. Examples of *prima facie* evidence defying the standard economic theory include, for example, the absence of migration despite persistent income gaps; or the presence of substantial flows in the absence of, or even in contradiction to, economic discrepancies between origin and destination. Migratory episodes displaying such empirical riddles for economists have been observed, *inter alia*, by Myrdal (1944) for the US and, more recently, by Faini *et al.* (1997) for South European regions, and by Fidrmuc (2004) and Hunt (2000) for East European regions.

New theoretical developments try to accommodate such phenomena by the construction of models that integrate social interactions. The incorporation of positive social interactions implies the existence of 'social multipliers' and allows small changes in exogenous variables to transform into large changes in the endogenous variable (e.g. Durlauf 2001; Glaeser and Scheinkman 2001; Manski

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2000). Individual behaviour depends on the choices made by the members of a reference group, and externalities across individuals determine the population-wide behaviour.

Translated to migration research, the assumption of this approach is that migration decisions are not taken by an individual in isolation but are influenced by the actual or intentional migration choices in one's peer group (endogenous effects) or by the group's specific characteristics (contextual effects). Historically, there has been little explicit modelling of these types of externality in migration (migrant networks, peer influences, immigrant clusters, herd behaviour, chain migration).<sup>1</sup> However, recent contributions show—both theoretically (e.g. Epstein 2002) and empirically (e.g. Bauer *et al.* 2006; Epstein and Gang 2004; Munshi 2003)—that social influences have a significant impact on the migrant's decisions about when and where to migrate (see also Epstein in this issue).

Most of the economic studies that empirically analyse the determinants of labour migration limit their sets of explanatory variables to the conventional socio-economic characteristics at the micro level, and to income and unemployment discrepancies at the macro level. If included at all, social influences are captured by very rough measures, e.g. by using stocks of immigrants to specific locations as proxies for network connections.<sup>2</sup> The reason for this omission is twofold. First, there is a lack of adequate data that would make micro-econometric analyses of the individual and group characteristics of migrants possible. Second, methodological problems in the economic analysis of social interactions have generated a rather pessimistic view about the possibilities of identifying 'endogenous social effects' (Manski 1993).

Economic models of migration have been criticised for their inability to account for non-economic determinants of migration (Massey *et al.* 1998: 8). While part of this critique is legitimate—it is precisely the economic dimension of migration choices which constitutes the main interest of modelling in economics—this paper argues that there is, however, a longer tradition in the literature that tries to loosen the exclusive focus on economic discrepancies between areas of origin and destination.

The aim of this paper is to show how advances in both theoretical modelling and empirical implementation have made progress in defining the economic counterparts of concepts considered to be intrinsically sociological—like cumulative causation or migrant networks. In contrast to the view presented in the literature, the argument followed here is that economic theories of migration have evolved incrementally. The simple version of the standard model was gradually refined to account for social determinants of migration. Due to the particularities of the economic method, economists modelling migration decisions traded breadth for rigour. Therefore, migration models in economics considered many complex non-market systems and interrelations between economic, social and political institutions only in terms of abstract generality. Even though the reductionist assumptions of economic models are certainly imperfect as descriptions of real migration behaviour, refinements of the

standard framework have been fruitful for the economic analysis of a wide range of subtleties of migration choices.

Such developments in the economic modelling of migration have been comprehensively reviewed in a number of prominent articles—Cushing and Poot (2004); Ghatak *et al.* (1996); Greenwood (1975, 1985, 1997); Greenwood *et al.* (1991); Molho (1986); Shields and Shields (1989). The present paper contributes with a new perspective focusing primarily on the social spill-overs included in these models.

The first section below provides an overview of the developments in conventional migration models. It argues that the basic human capital models of migration have been supplemented rather than challenged by newer models. In a complementary development, results in the economics of information have been used in search-theoretic models of migration to incorporate some dynamic features of migration choices. The paper then briefly addresses possible approaches to conceptualising social interactions in migration behaviour from a theoretical perspective; the subsequent section provides empirical examples of this. Some related data issues are discussed with particular reference to their relevance for the estimation of migration models. The ‘social interaction perspective’ on migration models offers a foundation for reconsidering the possibilities and limitations of interdisciplinary linkages in migration research. These are discussed along with the conclusions of the review in the final section of the paper.

### **Human Capital Models: The Individual Perspective**

In the standard economic analysis, the migration decision is explained as the result of an individual cost–benefit calculation, whereby a forward-looking migrant seeks to maximise his or her expected well-being over a time horizon by means of relocation. The seminal model for analysing *labour* migration was expounded by Larry Sjaastad (1962) as a case of seeking the highest return to one’s human capital. Individual rational actors decide to migrate if their expected discounted net returns from moving to an alternative location are positive. The decision is thus possibly affected by both pecuniary and non-pecuniary aspects, and by the likelihood of unemployment (Harris and Todaro 1970).<sup>3</sup>

Net returns from migration are estimated by subtracting from the expected returns to individual skills (wage earnings) in the destination country those expected in the country of origin.<sup>4</sup> In this estimation, wages are multiplied by the expected probability of employment in the country of origin and at the destination respectively. For a given time horizon from  $0$  to  $n$ , the streams of expected earnings differentials are summed over the time period. To obtain the present value of the income differentials, this sum has to be discounted by a factor  $r$  which reflects the greater utility of earnings in the present than in the future. The estimated costs of moving,  $C$ , are subtracted from this sum to obtain the expected net returns to migration.

The migration decision-making of an individual is thus formalised in the following equation:

$$ER = \int_0^n [p_{dest}(t) \cdot Y_{dest}(t) - p_{orig}(t) \cdot Y_{orig}(t)] \cdot e^{-rt} dt - C \quad (1)$$

where  $ER$  are the expected net returns to migration estimated for a time horizon from  $0$  (time of the decision) to  $n$  (time of e.g. retirement). The time-span  $[0, n]$  is divided into a continuum of periods indexed with  $t$ . The probabilities of being employed at a point of time  $t$  in the destination and the origin country are  $p_{dest}(t)$  and  $p_{orig}(t)$ .  $Y_{dest}(t)$  and  $Y_{orig}(t)$  are the earnings for period  $t$  in case of employment in the country of destination and origin;  $r$  is the discount rate.  $C$  denotes the total sum of migration costs which are expected to accrue only in the first period of time.

Under simplifying assumptions, the rational actor will migrate if and only if  $ER > 0$ . In other words, the trade-off faced by a potential migrant is that between the future benefits of being in a different location (the first term in equation 1, i.e. the present value of income differentials summed over the time period  $[0, n]$ ) and the present costs of moving (the second term,  $C$ , in equation 1).

Within this standard framework, aggregate migration flows between countries are the result of simply summing up individual mobility decisions. Migration would not occur in the absence of differentials in labour market conditions between countries. Given differences across individuals in moving costs, the size of the flows also depends simply on the differential in expected returns from migrating: the higher the present value of expected earnings differentials net of the moving costs, the more individuals will choose to relocate.

Within this broad framework, individual human capital characteristics decisively affect the migration decision.<sup>5</sup> In migration modelling, these characteristics also account for the heterogeneity of individual responses to migration stimuli. In addition to personal characteristics, social conditions, local amenities and heterogeneous preferences also enter into the migration decision process and explain the diversity in the propensities to emigrate.

The simple mechanics of the standard models have been used to illustrate and test the effects of migrant networks, for example by Bauer and Zimmermann (1997) and Jewell and Molina (2004). Both augmented the human capital model by defining the migration costs and the probability of employment as functions of existing connections to migrant networks (defined as friends, household or family members abroad):  $C = C(N)$  and  $p = p(N)$  in (1), where  $N$  denotes the size of the network and is usually proxied by the number of family members or acquaintances already in the destination area. In the context of studying migration decisions of ethnic Germans from the former Soviet Union to Germany and, respectively, of Mexicans to the US, both studies cited above show the network effects to be robust to the introduction of controls for human capital characteristics and local conditions.

### **Relative Income, Risk Sharing, and Families**

The standard human capital model of migration can be augmented by postulating that the migration decision-making entity is not the migrant in isolation. Migration decisions are instead the result of a joint process involving the migrant and some group of non-migrants (within families or households).<sup>6</sup>

Mincer (1978) was the first to examine the impact of changes in women's labour force participation on the migration decision of families, showing that family ties represent negative 'personal' externalities. Increased labour force participation rates of women produce a stronger interdependence of migration decisions among the family members: a family will only migrate if the gains from the moving of one member compensate the losses (opportunity costs) experienced by other family members.

Starting from a different viewpoint, other approaches have modelled the migration decision as risk-sharing behaviour of families or communities. As in the simple human capital model, international migration is viewed as an investment decision under uncertainty involving large sunk costs. In contrast to isolated individual actors, families or groups are able to diversify the allocation of their labour resources over geographically dispersed and structurally different markets in order to minimise the risks and to loosen constraints in markets other than the labour market (e.g. credit and capital markets).

A second important feature of these models is the assumption that individuals (as well as families or groups) evaluate their income not solely in absolute terms (as implied in the standard model) but engage in interpersonal income comparisons (Stark and Taylor 1989, 1991). In the relative deprivation approach, migration by household members is considered an important strategy to improve the household's income position relative to others in the household's reference group.<sup>7</sup> Belonging to a reference group with low relative deprivation is preferable to belonging to groups with high levels of relative deprivation, even if absolute income is higher in the latter. In addition to income differentials between origin and destination, the income *distributions* in both locations will influence migration decisions.

The inclusion of this comparison of income distributions (at the origin location and at the destination) into the migration decision model can change the theoretical predictions of standard migration models substantially. In addition to this, the newer models introduced another mechanism likely to impact on the accuracy of the expected-income models' predictions: the effects of asymmetric information on migration (Katz and Stark 1987). Under a regime of asymmetric information, migrants have full information about their human capital but potential employers in the destination country do not observe their true level of skills. Assuming that the employer has information only on the distribution of skills in the migrant population but not on individual human capital (skill information is asymmetric), the employer will pay the migrants a wage equal to the average productivity of the migrant group. Pairing the assumption of asymmetric information with that of heterogeneous

workers gives rise to different implications to those of the standard model. Although highly-skilled individuals have greater incentives to migrate when information about their productivity is available to employers, under this kind of asymmetric information such individuals will receive reduced pay, and they will therefore be less likely to migrate relative to those with below-average skills.

Models of risk-sharing and family migration also provided the first framework for explaining how intra-group interactions could explain variations in the economic behaviour of immigrants in the host labour markets. Appealing to strategic behaviour, these approaches were the first to be used for analysing the migration patterns with heavy reliance on 'network and kinship capital' (Stark 1992; Taylor 1986).

### **Endogenising Migration Costs: The Economics of Cumulative Causation**

A complementary line of research has addressed the determinants of migration decision-making in a dynamic fashion. This research started in the mid-1970s, with contributions that increasingly addressed the structure of information about foreign locations available to prospective migrants. Gordon and Vickerman (1982), Graves and Linneman (1979), Maier (1985), and McCall and McCall (1987) were among those who emphasised in their models the search process by which migrants acquire information about conditions at the destination and about the costs of moving (see Molho 1986 for an overview). Building on the traditional perspective of migration behaviour, these search-theoretic models combined insights from the human capital approach and random utility theory. In this framework, two types of migration are postulated to occur: 'speculative migration', in which the migrant moves in order to search for a job, and 'contracted migration', in which the migrant moves to take a job he or she knows to be available. The sequential decision tree for contracted migration is divided into three main conditional probabilities involving the probability of searching, the probability of receiving an offer, and the probability of accepting the offer (Gordon and Vickerman 1982). Using the search process, models in this vein were the first to link the heterogeneity of migration flows to the structure of information networks. Following the 'friends and relatives effects' advanced by Greenwood (1969), various mechanisms were consequently proposed for the dissemination of information regarding migrants' potential destinations (which were originally specified in migrants' utility functions, i.e. essentially wages and unemployment, but also mean and variance of wages and the demand conditions).

DaVanzo (1981) broadened the well-known Harris-Todaro model (1970) by introducing the concepts of location-specific human capital and information costs. Within the economics of information framework, these concepts capture precisely the idea that social ties built up over time limit the migration propensity. A typical migrant uses a narrow range of 'search fields' depending heavily on friends or relatives as providers of information.<sup>8</sup>

Carrington *et al.* (1996) use a dynamic model in which migration costs are endogenously declining with the stock of migrants already settled in the destination area. They explain the timing (with endogenous moving costs migration occurs gradually over time) and the patterns (flows can increase even with simultaneously narrowing income differentials) of migration flows, which could not have been explained in traditional Harris–Todaro models.

Chau (1997) constructed a model of migration where migration costs vary inversely with the number of previous migrants from the same sending region to the same corresponding receiving region. The essential contribution of her approach was in formally modelling the chain migration phenomenon ('migration stock effect') and in showing that it may cause multiple population equilibria.<sup>9</sup> Previously, Greenwood (1970) had already described conditions under which migrant stocks attract further migration. This idea, formalised by Chau (1997), is used extensively in the literature on migration from less-developed countries (see e.g. Borjas 1995).

In sequential models of migration a primary move causes search, increases the migrants' information and triggers in turn another move, either onward or return. DaVanzo (1981), Pessino (1991) and Tunali (1996) apply this sequential approach empirically to repeat and return migration. In this context, return migration becomes consistent with an extended human capital model, particularly when considered in the framework of family decision-making. Individuals move to acquire human capital, usually in the form of experience or training, and return to make use of it in their home region (e.g. Banerjee 1991). Additionally, empirical studies of return and repeat migration show the selectivity implications of these types of movement.

Polachek and Horwath (1977) introduced the concept of 'the peregrinator', an individual who gathers information in the course of migration, possibly spending time in multiple locations. This information stock is continuously replenished but decreases after each movement. Changes in locational characteristics are, however, exogenous and do not enter into the migration decision. This last point is treated differently due to the dynamic features of models such as those of Burda (1995), Diamantides (1994) or Polachek and Siebert (1993). All these models take into account uncertainty about both current and future characteristics of different locations.<sup>10</sup>

O'Connell (1997) develops a model with uncertainty about both current economic conditions abroad, and foreign and domestic future developments. In a partial equilibrium setting, uncertainty about conditions at the destination encourages speculative ('try your luck') migration. Uncertainty about future wage differentials acts in the opposite direction, leading to 'wait and see' behaviour. Burda (1995) uses a similar model with wage differentials which are uncertain, as in O'Connell (1997), but diminishing over time.

To sum up, beyond their complex dynamic features these models incorporate basically two rather simple concepts into the economic modelling of migration decisions: that of migration networks and, more generically, that of cumulative causation. The role of migration networks is revealed in the search-theoretic

framework as a mechanism for decreasing the costs and risks of migration under imperfect information. The economic counterpart of cumulative causation is introduced by the dynamic character of the search process. Each step in the search process alters the motivation and information constraints of potential migrants. Realised migrations modify in turn the characteristics in the corresponding locations—in terms of, for example, income, wealth, population, or land distribution (cf. Mueser 1989).

Due to the work of Douglas Massey, the concept of cumulative causation became pivotal in migration research both in terms of theoretical explanation and as a tool for empirical research. While in the broader field of development economics the theory of ‘cumulative causation’ has a long tradition (cf. Myrdal 1957), in economic migration research some of its dynamic features have been implicitly incorporated in search-theoretic models. This line of modelling is often neglected in sociological accounts of migration research in economics. If they are considered at all, such attempts to model migration decisions dynamically are viewed as being merely concerned with path dependency, while only their sociological pendants manage to capture the more complex cumulative causation (Massey and Zenteno 1999: 5328). However, the reviewed literature suggests that it is precisely the refined standard economic approach which provides a comprehensive framework for explaining the dynamic features of circular and cumulative causation.<sup>11</sup>

### **Social Interactions in Migration Choices**

The previous section of the paper sketched the advancement of migration modelling in economics with a special focus on those approaches which incorporate some social dynamics, i.e. models that account for socially mediated factors influencing the initiation and perpetuation of labour flows. The simple question was how the role of others in an individual’s migration decision-making is modelled in economics. Is there an economic analogue for the ‘meso-level’ effects described in other social sciences? In what way does migration behaviour in one’s reference group influence individual migration choices?

From an economics perspective, the more general point under scrutiny in this paper is that of feedback effects on individual choices, which in turn affect the observed equilibrium outcomes. The empirical irregularities mentioned in the introduction could be due to this type of feedback effects or interactions: some type of interaction explains why the migration choices of an individual are positively related to the prevalence of similar choices in the individual’s reference group.<sup>12</sup>

To better understand the possibilities and limitations of applying the economic approach to the questions addressed in this paper, this section draws on Manski’s (2000) conceptualisation of social interactions. Manski identifies three possible channels through which social interactions may enter the utility functions of migrants: through constraints, through expectations, or through preferences. It is

useful to bear this typology in mind in the description of existing economic models that follows.

The most direct way to introduce social interactions into models of migration is through critical mass behaviour.<sup>13</sup> In this case, the expected utility derived by a potential migrant from his or her decision to move or to remain immobile depends on how many other individuals in the reference group choose which of the two alternatives. There are two ways to conceptualise such a behaviour in the context of migration: first, through constraints faced by migrants; and second, through threshold effects in migration decision-making, the most prominent example being the case of chain migration. In the first case the emphasis lies on the increasing costs (of re-location), in the second on the increasing benefits (from re-location) due to the proportion of other individuals who have already made the decision to migrate.

The models using constraints are constructed in the tradition of Tiebout (1956) and Tullock (1971).<sup>14</sup> The main idea is that, *ceteris paribus*, migrants' locational decisions take into account externalities due to bundles of publicly provided goods in the origin and/or destination area. In such models a public good is usually introduced in order to define an equilibrium condition for migration flows. In his study of the joint determination of migration flows and economic growth, Braun (1993) introduces congestion costs to slow down migration flows. A similar mechanism is used in Krugman (1991) whereby migration declines as income differentials are reduced.<sup>15</sup>

Dustmann and Preston (2001, 2004) and Dustmann *et al.* (2004) implicitly used a constraints-based model when analysing the dependence of migration decisions and labour market assimilation on the local concentration of ethnic minorities (which in turn determined attitudes regarding minority populations).<sup>16</sup> A similar 'thresholds perspective' is suggested in Stark's overview of migration modelling: '... new migrants are assisted by those who have migrated earlier; one good way of having a higher proportion of all trades conducted among migrants when there are few of them is to have additional migrants. The arrival of new migrants confers benefits upon the earlier migrants' (1991: 26).

Most of the existing economic models with network externalities in migration incorporate social effects into migrant decisions by allowing for uncertainty or direct impacts on preferences. Among these two alternatives, uncertainty is by far the most common.

In the models described in the previous section, uncertainty has two potentially different roles. The first type of uncertainty occurs when future evolutions at the destination and/or in the origin area are unknown and so migration is delayed in order to allow the uncertainty to be resolved. The second type refers to unobserved present conditions at the destination, which may be reduced as more individuals migrate. O'Connell (1997) incorporates both types of uncertainty in a dynamic optimising model and demonstrates that in equilibrium the migration behaviour is

more likely to depend on uncertainty about the future ('wait and see') than on uncertainty about the current destination ('try your luck').

Socially interdependent preferences (Postlewaite 1998) enter into the migration decision process either in relation to the characteristics of other members of the reference group (contextual), or in relation to the migration choices of others in one's reference group (endogenous).

The first type of preference is more often made use of in economics through the relative deprivation approach. The second type is applied rather implicitly in the augmented human capital models described earlier (e.g. in Jewell and Molina 2004), or used as instruments for explaining (exogenously) e.g. the level of human capital accumulation in the context of migration (as in models of Beine *et al.* 2001; Stark 2004; or Stark and Wang 2002).

Stark and Taylor (1991) use the individual (absolute) income in a relative deprivation model to compute a measure of the relative income position with respect to a specific reference group. The relative deprivation measure for one individual is defined either due to his or her (subjective) self-reported feeling of deprivation or due to his/her (objective) position in the income distribution of his/her group of reference.

Similarly, recent models have tried to incorporate a 'fear of enhanced relative deprivation' for explaining some counterintuitive behavioural choices of migrants (e.g. segregation trends and the reluctance of migrants to invest in language acquisition, the host country's culture, or in education). Assuming an endogenous formation of reference groups, this line of modelling uses two types of argument; Akerlof's (1997) concept of social distance is instrumental in both lines of argumentation. The first one is that reference groups impose costs on members who try to act differently. The second is related to how interpersonal comparisons affect individuals' well-being.

Austen-Smith and Fryer (2005) use the first type of argument and analyse the dilemma between community loyalty and individual success in the case of 'acting white' behaviour. They thus offer one potential explanation of the ongoing puzzle of under-achievement of members of black minority groups: fearing rejection by their social peer group, members of black communities have disincentives to invest in particular types of behaviour (e.g. language or education).

The second type of argumentation is implemented in Fan and Stark (2007). They show that the migrants' efforts to assimilate will be muted if a more intensive assimilation results in migrants' comparing themselves more with natives and less with peer migrants. If natives are better positioned than migrants, for example in terms of income distribution, these will prefer fellow-migrants to natives as their own social reference group.

Herd effects represent an additional channel through which social dynamics are introduced into the preferences of potential migrants. Herds are used in the search-theoretic framework as information externalities (e.g. Epstein in this issue).

## **Social Interactions in Empirical Migration Research**

While the theoretical conceptualisation of social interactions in migration models has evolved following the logic of the economic model, empirical research has lagged behind theory. There are two main categories of problems hindering advancement in the empirical analysis of social dynamics in migration behaviour. The first is related to finding an adequate empirical equivalent of theoretically defined interactions. The second type of problem is more fundamental and relates to the difficulty of identifying social interactions in the non-experimental data commonly available for studying migration decisions in economics.

Empirical approaches in economics have imported sociological concepts such as 'social capital', 'peer influence' or 'migrant networks'. Yet the instrumentalisation of these concepts in estimation lacks a precise definition. Consequently, it is often unclear exactly what type of effect is ultimately captured in the estimation. Many approaches maintain little connection to any of the theoretical structures described in the previous section. Instead they merely test correlations between behavioural choices and infer the existence of interactions among individual actors.

However, even after clarifying definitional problems, several difficulties arise when trying to estimate social interactions in migration choices. The common objective of such empirical research is to find out whether some form of social dynamics explains why individuals belonging to the same group tend to make similar migration choices. Why for example are members of local communities with high prevalence rates of migration themselves more willing to migrate than those coming from communities with no previous migration, even if both the communities and the individuals are otherwise similar? What explains the clustering of migrants from one specific community to a specific destination even in the absence of network ties?

The hypothesis of interest in this context is that, due to particular forms of externalities, the behaviour of the reference group affects an individual's migration decision. To detect these social effects empirically, I shall again draw on a typology offered by Manski, who distinguishes between three types of interaction (2000: 127).

First, one can point to so-called endogenous interactions, meaning the influence of group behaviour on individual behaviour. The idea here is that the migration choices of an individual depend on the choices of others in his reference group. The best illustration of these endogenous effects is so-called herd behaviour (Bikhchandani *et al.* 1998) or community ties (Winters *et al.* 2001). In these cases, similar migration choices are explained, after controlling for personal and local characteristics, based on affiliation to a particular community.

Second are contextual interactions, meaning the influences of group characteristics on individual behaviour. In other words, the migration choices of an individual vary with the exogenous characteristics of the group. In the literature, this type of contextual effect is exemplified by relative deprivation models and, more generally, in the context of cumulative causation. In these approaches either the income distribution or other characteristics of the group's members are used as *explanans*

for migration decisions. In Jewell and Molina (2004) an improvement in the relative income position improves a household's welfare and the relative deprivation significantly affects migration decision-making.

The third type of effect concerns correlated effects, which do not have a social character similar to the previous two. They capture similarities in migration behaviour which are due to similar individual characteristics of the members of a reference group or due to the fact that they face similar institutional constraints.

In migration models, endogenous and contextual effects describe distinct channels through which migration choices of individuals are influenced by their 'meso-level' or social environments. Where correlated effects are observed, it is critical to control for underlying factors (either individual characteristics or some macro-variables, including, for example, legal arrangements) that influence migration choices.

It is important to distinguish among these three types of effect, because each has different implications. Endogenous effects emphasise the social dynamics of migration decisions. They help us to understand the role of feedback from group to individual choices and imply multiple equilibria for macro-behaviour. Contextual and correlated effects do not imply the existence of such feedback.

Most of the data applied for estimating migration models in economics, however, do not allow a differentiation of endogenous, contextual and correlated effects. The main methodological problem in distinguishing endogenous from contextual effects arises because behaviour at the group level is itself an aggregation of individual behaviours. This is the so-called reflection problem (Manski 1993). It is not possible to discern whether migration choices considered at the group level do affect individual choices or are merely the aggregation of these individual choices. Group and individual behaviour are thus simultaneous, in a similar way to the simultaneous movements of an object and its reflection in the mirror (hence the 'reflection problem').

Apart from this simultaneity problem, there are two other important ways in which endogeneity can arise in empirical applications. First, due to the problem of correlated unobservables and errors-in-variables, large differences in migration patterns among otherwise similar groups may be due to correlated individual characteristics which are unobserved. Second, due to endogenous membership (the problem of self-selected participation), the observed variation in migration behaviour among groups may be determined by the fact that individuals are sorted among groups rather than by social interactions.

Glaeser and Scheinkman (2001) discuss some approaches to overcoming these problems. Such methods have not been widely applied in studying migration, mainly because of inadequate data. However, panel data or cross-sectional data containing retrospective information can be used to study the dynamics of migration decisions. Individual choices can be modelled as a function of both the contemporaneous and lagged behaviour of the reference group. Another option—used for the identification of migrant networks' effects by Munshi (2003)—is to instrument for the migration behaviour at the group level using exogenous location or group members'

characteristics. Munshi uses variation in rainfall across communities to predict differences in prior migration. Since differences in prior rainfall should have no direct effect on current migration, nor on labour shocks at the potential destination, they are not subject to the simultaneity bias (Munshi 2003: 551).

In general, understanding the role of social interactions in migration decisions will require richer data than those commonly used until now in the economic literature. Apart from the issues previously mentioned, such data have to allow for the identification of the relevant reference groups. Manipulating such data will thus elicit explanations about which groups matter for individual migration choices, and uncover interesting properties of interactions.

### **Conclusions and Prospects for Interdisciplinary Research**

This paper has surveyed some of the striking changes at work within the economic modelling of migration. Special attention has been paid to the channels through which formal modelling has evolved to incorporate more realistic assumptions about social ties. In particular, the paper has investigated the extent to which newer economic theories of migration have been successfully adapted to incorporate interaction-based models of behaviour. Such theoretical advancements would allow some further steps towards migration models that can account both for heterogeneity across individuals and for the interplay between individual decisions and group behaviour.

While interaction-based models have already been used in many other areas of economics, systematic work has yet to be done in the field of migration. As discussed previously, the reasons for this deficiency are empirical and methodological, rather than theoretical. However, the literature surveyed revealed that several traditional economic approaches used to explain migration choices have adopted structures reflecting social dynamics—most prominently in the search-theoretic and human capital frameworks.

These developments do not constitute a refutation of former approaches to modelling migration decisions. Methodologically, they have remained consistent with their forerunners, shifting the perspectives and the units of analysis (as in the case of the ‘new economics of labour migration’) or incorporating more complex dynamics (as in the search-theoretic models).

This methodological consistency of migration models in economics remains the touchstone of limitations for interdisciplinary research on migration issues. While recent economic models manage to import some fundamentally sociological concepts, this is not to imply an unlimited convergence between approaches from the two disciplines. Even though recent developments in *socioeconomics* have involved attempts to relax the rational expectations assumptions, and to develop mechanisms allowing preferences to evolve, all the economic explanations of migration behaviour will necessarily remain explicable only in terms of individuals, not of other social categories (see Boswell in this issue). The nature of the divergence between the two

disciplines is, however, more spurious than commonly presumed in the sociological critique of economic approaches to migration behaviour. Notwithstanding dominant perceptions, most mainstream economics models incorporate social variables, not attachable to particular individuals (Schelling 1978; Schumpeter 1909). Or, in Krugman's words, 'The problem is that there is no alternative to models. We all think in simplified models, all the time. The sophisticated thing to do is not to pretend to stop, but to be self-conscious—to be aware that your models are maps rather than reality' (Krugman 1995: 79).

## Notes

- [1] Some notable exceptions are Chau (1997), Helmenstein and Yegorov (2000) and Taylor (1986). A pioneering contribution in exploring the social determinants of migration is the little-noted essay by Thadani and Todaro (1984).
- [2] However, this type of model reached a high level of sophistication in the attempt to identify the importance of networks in both the decision to migrate, as in Winters *et al.* (2001), and among immigrants at destination, as in Munshi (2003).
- [3] The models discussed in this section are human capital investment models and their variants incorporating expected income measures.
- [4] The use of earnings is of course a simplifying assumption. It could be easily replaced by a general utility function which captures much more than that. However, the basic mechanics of the model would be the same.
- [5] This is indeed one major topic of empirical micro research on the migration decision-making. For surveys compare Greenwood (1975, 1985, 1997).
- [6] The models considered in this section are usually referred to as the 'new economics of migration'. Although not treated systematically, the main features of these models (see Stark and Bloom 1985 for a summary) were already considered in the economic literature years before. They extend rather than challenge the basic assumptions of the standard human capital model.
- [7] This approach is applicable to both individual and group models of migration decision-making.
- [8] The accumulation of local human capital is analogous to job tenure in work experience models.
- [9] MacDonald and MacDonald (1964) summarise early models of chain migration.
- [10] McKenzie and Rapoport (2004) consider the dynamic effect of networks on migration propensities and inequality in the region of origin. They show that migrant networks—in the presence of remittances—induce migration that reduces income and wealth inequality. Jewell and Molina (2004) report similar results using an augmented Harris–Todaro model.
- [11] Pioneering work in this area is attributed to Ira S. Lowry (e.g. 1966).
- [12] Often such interactions are described as social norms, peer pressure, conformity, contagion, herd effects, imitation, or bandwagon.
- [13] Schelling (1978) and Marwell and Oliver (1993) develop formal theory to model collective action and apply this to diverse cases of critical mass behaviour.
- [14] There is also a considerable bulk of empirical research in the pure Tibout tradition on the effects of local public goods on the migration decision-making: Borjas (1999), Cebula (2002), DeJong and Donnelly (1973), Kau and Sirmans (1976).
- [15] In an analogue way, Lazear (1999) and Konya (2002) use respectively diversity and assimilation costs.

- [16] Such constraints could be negative network externalities as in Bauer *et al.* (2006) or public goods as in Hammond and Sempere (2004). In a similar manner, Fujita and Weber (2004) analyse migration policy choices (immigration quotas) in a game-theoretic setting which includes a measure of the magnitude of 'cultural frictions' between natives and immigrants as well as labour market complementarities between them.

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