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On the dynamics of interstate migration: Migration costs and self-selection

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ABSTRACT

This paper develops a dynamic structural model of migration decisions that is aggregated to describe the behavior of interregional migration. Our structural approach allows us to deal with dynamic self-selection problems that arise from the endogeneity of location choice and the persistence of migration incentives. The self-selection problem is solved by keeping track of the distribution of migration incentives over time. This econometric treatment has important consequences for the estimation of structural parameters such as migration costs. For US interstate migration, we obtain a cost estimate of roughly two-thirds of an average annual household income. We also show that the treatment of income persistence has important consequences for comparative statics of the model as well as microeconomic age patterns of migration.

1. Introduction

Migration choices are important economic decisions. Migration allows individual agents to evade adverse shocks to their income and it is an important way of macroeconomic adjustment (Blanchard and Katz, 1992, and Decressin and Fatas, 1995). Many factors influence the decision to migrate and a vast empirical literature has analyzed how migration decisions are driven by economic incentives, in particular by income differentials.[2] Since migration is a dynamic discrete choice problem, advances in modeling these problems[3] have opened up new frontiers for empirical research on migration too. This

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[2] See Greenwood (1975, 1985, and 1997) and Cushing and Poot (2004) for survey articles.

[3] See Keane and Wolpin (2009), Norets (2009), Aguirregabiria and Mira (2010).

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triggered a recent interest in structural models of migration.[4] Common to these papers is an i.i.d. assumption for the agents' incomes after controlling for observables.

In this paper, we highlight that a deviation from this i.i.d. assumption has stark consequences for the estimation of structural parameters, the comparative statics of migration with respect to migration costs, and the age patterns of migrants. This is because of *dynamic self-selection*. If (residual) incomes are autocorrelated (as shown by e.g. Storesletten et al., 2004 or Low et al., 2010), repeated decision making implies that neither migrants *nor the population* taking migration decisions are a random sample with respect to income. The income of an agent is typically highest in the place she currently lives in, because she will have – in her past – selected herself into a region where she is best off.[5]

In non-repeated discrete-choice modeling ("now-or-never" type of decisions), various solutions to self-selection problems have been discussed, see Heckman and Robb (1985) for an overview. In the context of migration, the role of such static self-selection for the estimation of migration gains was discussed by Nakosteen and Zimmer (1980).[6] Their proposed solution builds on a selection model of the type popularized by Heckman (1974, 1976, 1978) and Lee (1978, 1979). However, it rests on the assumption of non-repeated discrete choice and on residual income heterogeneity being i.i.d.

We first elaborate on the difference between *dynamic and static self-selection* in a stylized two period setup that has the advantage of analytical tractability. Thereafter, we develop a fully dynamic model of repeated migration choices. This model allows us to take a classical, simulation-based estimation approach of the structural parameters while taking serial correlation in potential incomes and self-selection into account. Our approach relies on explicitly modeling the dynamics of the distribution of potential incomes. Our modeling strategy follows Caballero and Engel's (1999) paper on investment, which highlights the interaction of lumpy investment and the evolution of investment incentives. In the spirit of their model, we develop a microeconomic structural model of migration which can be used to describe the simultaneous evolution of unobservable migration incentives and migration rates at an aggregate level. This allows us to identify the model parameters from the business-cycle frequency fluctuations in migration rates. We use annual US state level migration flows from 1989–2008 from the IRS. An advantage of our approach is that we can easily combine information from different levels of aggregation. Specifically, we also exploit information on dispersions of household incomes by state and year from the Current Population Survey (CPS).

In estimating our model, we obtain four important findings. First, we estimate migration costs to be US$ 34,248 for a typical move between US states. This number is substantially smaller than the ones reported in previous contributions, such as Davies et al. (2001), but in line with Kennan and Walker's (2011) estimate – at least when they take expected payoff-shocks into account. Second, we show that it can generate a substantial bias in estimated migration costs if one ignores the endogeneity and the dynamics of the distribution of unobserved potential incomes. Third, we show that the comparative statics of the model with respect to exogenous changes in migration costs, for example due to more or less liquid housing markets, changes substantially with assumptions regarding if and how to model persistence of potential income differences across states. Fourth, we also document migration dynamics at the microlevel that differs from a model which does not keep track of the incentive distribution. One of the best documented facts from microdata is that younger households are more likely to migrate than older ones. The prominent explanation for this is the so-called human capital channel where migration is an investment in human capital that pays off longer for younger agents (Sjaastad, 1962). A problem with this explanation is that it cannot capture the sharp decline in migration rates between ages 20 and 30.

We shut down this human capital channel and apply a perpetual-youth model instead where the decision problem of the agent is stationary and independent of the agent's age. Nonetheless, age influences migration in our model because it is an argument of the distribution of migration incentives. As in Jovanovic's (1979) job search model, the match between agent and region becomes more efficient as agents get older, since agents have selected themselves into their preferred region. This mechanism, while in principle discussed in parallel work by Coen-Pirani (2010) and Kennan and Walker (2011), provides in our setup a new quantitative explanation for the empirical age–migration pattern. We show that autocorrelated incomes are key to the close quantitative match of observed and model-implied age patterns if one does not want to rely on age-dependent migration costs as in Kennan and Walker (2011). To make this point we show that one obtains very different and counterfactual results if approximating the persistence in incomes by a mixture of an i.i.d. and a fixed effect component.

Kennan and Walker (2011) have a framework where migration is an experience good and choice is between 50 regions whereas we assume that the household knows alternative opportunities at each point in time, modeled in a bi-regional setup. We use a bi-regional setup because simulating the dynamic evolution of migration incentives is numerically intense even if solving the microeconomic decision problem itself is quick. In Kennan and Walker (2011), income dynamics is given by a combination of fixed location-specific shocks and an i.i.d. component, whereas we model it as an autoregressive process. To match age patterns of migration, Kennan and Walker consider age–specific migration preferences. At the same time, they account for further household characteristics, obtaining identification from cross-individual variations in migration patterns,

[4] See e.g. Armenter and Ortega (2010), Coen-Pirani (2010), Gemici (2011), or Kennan and Walker (2011).

[5] Norets (2008) shows that wrongly assuming i.i.d. unobservables can create significant estimation biases in dynamic discrete choice models and therefore (Norets, 2009) develops a Bayesian estimation technique for this class of models with serially correlated unobservables.

[6] Examples of further studies addressing static self-selection in migration are: Borjas (1987), Borjas et al. (1992), Tunali (2000), and Hunt and Mueller (2004).