Part 1

Urban search matching

There is a vast literature on search and matching theory that emphasizes the importance of flows in the labor markets (Mortensen and Pissarides, 1999; Pissarides, 2000). These models, now widely used in labor economics and macroeconomics, have greatly enriched research on unemployment as an equilibrium phenomenon, labor market dynamics and cyclical adjustment. The starting point of the analysis is to recognize that labor markets are characterized by search frictions. This means that it takes time for workers to find a job and for firms to fill up a vacancy so that unemployed workers and vacant jobs can coexist in equilibrium, a feature not possible in a standard Walrasian world (i.e. a frictionless world where workers and firms can move costlessly and instantaneously between working and not working). Because of these search frictions, the contacts between workers and firms depend on the market variables and the arrival rate of contacts for workers increases with the number of unemployed searchers**,** while the arrival rate of contacts for firms increases with the number of vacant firms. A constant-return to scale function is a convenient way of capturing these properties, which is referred to as the "matching function" (Pissarides, 1979). Indeed, the matching function relates job creation to the number of unemployed, the number of job vacancies and the intensities with which workers search and firms recruit. It successfully captures the key implications of frictions that prevent an instantaneous encounter of trading partners.[1,2]

However, the spatial dimension is absent in all these models, even if it has been recognized for a long time that distance interacts with the diffusion of information. For example, in his seminal contribution to search, Stigler (1961) puts geographical dispersion as one of the four immediate determinants of price ignorance. The reason is simply that distance affects various costs associated with search. In most search models, say for example Diamond (1982), distance between agents or units implies a fixed cost of making another draw in the distribution. In other words, a spatial dispersion of agents creates more frictions and thus, more unemployment. This is a weakness of the analysis since empirical evidence supports the idea of a clear *spatial dimension of labor markets* (see**,** for example, the survey by Crampton, 1999).

[1]For theoretical surveys of search-matching models, see Mortensen (1986, 1988), Mortensen and Pissarides (1999a,b), Pissarides (2000), Rogerson, Shimer, and Wright (2005) and Postel-Vinay and Robin (2007).

[2]Empirical evidence of search and matching models is well-documented. See, in particular, the surveys by Devine and Kieffer (1991), Davis, Haltiwanger, and Schuh (1996), Petrongolo and Pissarides, (2001), Eckstein and Van den Berg (2007) and Yashiv (2007).

The interaction between space and labor markets is complex, however. The aim of this part is to capture some of the phenomena at work and, in particular, account for the spatial dimension of search.

The first search paper that (implicitly) introduces space is the famous island model of Lucas and Prescott (1974). This model formalizes the idea of search frictions through space by introducing a large number of separated labor markets (islands) where one firm is located in each island subject to productivity shocks. The authors refer to the locations as "islands" populated at any moment by firms that cannot move among islands while workers can. The wage is competitively determined on each island. Consequently, the distribution of wage offers represents productivity differentials across different islands (or locations) at a given point in time. As productivity on each island is subject to idiosyncratic shocks, workers need to spend some effort in locating better matching opportunities and eventually relocating across islands in their pursuit of wage gains. This is because communication among islands is imperfect in the sense that each worker only knows the current wage on his or her own island, that these differences exist and their extent as described by the wage offer distribution function. This knowledge motivates investment in search as a means of finding an island where labor is more highly rewarded than on the island currently occupied. The main result is to characterize an economy with unemployed workers (i.e. those who are currently on islands where labor productivity happens to be below the opportunity cost of working) and employed workers with different wages, both results due to spatial frictions.

Even if this model is interesting, the spatial analysis is quite shallow in the sense that there is no land/housing market. The island story is just a metaphor for characterizing search frictions.

In this first part of the book, we explicitly deal with the urban aspects of search-matching models by modeling both labor and land markets. In Chapter 1, we will first present some simple models of urban search-matching. In the benchmark model, search effort is exogenous but still affects the matching function. We relax this assumption because distance to jobs is a crucial channel through which space affects the labor market. Indeed, workers who live further away from jobs may have poorer labor market information and be less productive than those living closer to jobs (Seater, 1979). This is particularly true for younger and/or less-skilled workers who rely heavily on informal search methods to obtain employment (Holzer, 1987).[3] The reliance on these informal methods of job search suggests that information

[3]We will investigate the issue of social networks in more detail in the last chapter of this book.

on available job opportunities may decay rapidly with distance from home (Ihlanfeldt and Sjoquist, 1990). Thus, we develop a model where distance to jobs affects workers' search efficiency and study its impact on land and labor market outcomes.

In Chapter 2, we further extend the basic urban search-matching models. We consider the following interesting extensions of the benchmark model: workers' heterogeneity in training costs, endogenous job destruction, positive workers' relocation costs and, finally, wage posting instead of wage bargaining

Finally, in Chapter 3, we study the case of non-monocentric cities. We study rural-urban migration by extending the standard Harris-Todaro model to incorporate search frictions and an explicit land market. Following the seminal contribution of Salop (1979), we also analyze an urban framework when there is a finite number of job centers and a continuum of jobs as in Marimon and Zilibotti (1999). In that case, workers will have different productivities while firms will have different job requirements. Some jobs will be matched to workers, even though the productivity of the match is quite low. We will consider both wage bargaining and wage posting models.