Search, Migration, and Social Connections: The Puzzle of Migration to Beijing

By Teng Ge* and J. Roberto Parra-Segura†

March 2008
(Preliminary draft, please do not cite or circulate without the authors' permission)

We provide a plausible explanation for the phenomenon of migration to big cities such as Beijing and Shanghai. This process can be observed particularly among students who migrate to these cities and upon completion of their studies prefer to look for their first job there instead of going back to their hometowns. Despite the slightly higher wages offered in big cities, the fact that the living costs are much higher and that there is more competition to get jobs compared to small cities, it is not clear why recently graduated students feel attracted to remain in big cities. We develop a search and matching model where we consider that social connections created by agents during their studies are used as a tool to get jobs. We solve for the optimal investment in social connections, and for the level of social capital that makes agents indifferent between migrating or staying in their current location. We show, by the use of a computational model, that for agents with a sufficiently large social network, the value of social capital is large enough to overcome the value of going back to their hometowns, where the would face lower competition and living expenses, but they would lack the advantages that a social network represents.

1 Introduction

The migration of the labor force from rural to urban areas is both a significant and a common phenomena in developing economies. Most of the models that study rural-urban migration argue that the flow of migrants to the urban sector reduces the probability of employment there, and hence that the expected

*Department of Economics, University of Essex. E-mail: tgev@essex.ac.uk
†Faculty of Economics, University of Cambridge. E-mail: jrp56@cam.ac.uk

payoffs from higher wages paid in the urban areas and from lower wages paid in rural areas will be equalized in equilibrium[1]. This models argue that the public policies that intend to solve the unemployment problem by creating more jobs in the urban areas are condemned to fail, since the creation of new jobs will be offset by further inflows of new migrants. A similar implication can be found in the search literature that assumes a frictional market, as in Molho (2001), Coulson et al (2001), etc.

Therefore, it seems natural to ask the two following questions: if wages are increased or more jobs are created in the rural areas, either through public policy or modernization, will some agents in the urban areas decide to move back to the countryside? And, if that is the case, which agents will decide to do so? Most models provide an affirmative answer to the first question, and mention that any agent would decide to move to a rural area until the marginal payoffs are equalized due to the migration process. However, the empirical evidence frequently contradicts this intuition and is not able to provide much evidence to answer the second question. A good example of the inconsistency between the theoretical predictions and the empirical observations is found in the case of new graduates making decision about their job searching process in Beijing. Despite the similarity between starting wages in Beijing and in many smaller cities, and the much higher living costs in Beijing[2], 95% of new graduates from universities located in Beijing decide to stay and search for their first job there. This phenomenon contradicts some results from trade theory (the law of one-price), migrations theories, and spacial searching models.

We argue that social networks and personal connections are part of the answer to the puzzle explained above. There exists an extensive work both empirical an theoretical that looks at the use of personal contacts by job seekers. These works try to analyse to what extend do workers rely on personal sources of information to learn about available vacancies and to obtain jobs. Studies such as the one by Myers and Schultz (1951) mention that more than 60% of the workers they surveyed obtained their first job by the use of personal connections. In the same way, Granovetter (1973) found that 50% of the agents that participated in his study obtained their current job through the use of social networks. Still other studies, like those by Blau and Robins (1990) and by Holzer (1988), show that a higher proportion of jobs found via personal contacts are likely to be accepted [3]

[1]Look for example at the classic paper by Harris and Todaro (1972), and at Todaro and Smith (2006)

[2]According to labor market statistics, the starting wage for new college graduates in Beijing was 2,500 Yuan per month in 2003, and the same average starting wage could be found in Tianjin (as happens in many other cities). At the same time, the China Statistical Yearbook (2003), mentions that residents in Beijing face food expenses that are two times higher than those in Tianjin. Similar differences in expenditure levels can be found for clothing, medical care, household services, and education. Finally, transport and communication costs are almost three times higher in Beijing.

[3]For a detailed review of the empirical evidence and of the main theoretical models devel-

In this paper, we build a dynamic equilibrium model with the aim of answering the two questions proposed above. We analyse the process of migration between two cities of different size. We consider that heterogeneous unemployed workers are able to build social connections and link with employed workers in the same city, who then become a source of job opportunities. The ex-ante uncertainty in the job matching market makes these social connections valuable for unemployed workers. Hence, the potential loss that results from moving to an alternative location and abandoning the already established social connections makes it unattractive for workers to move to a new city. That is, agents value the social capital they have built in the city where they are currently located. The increase in the expected payoffs that may result from migration should be large enough to compensate for the welfare loss that results from abandoning the existing social capital and the cost of building a new one.

We separate the search equilibrium from the migration equilibrium. We consider that in the first case the workers choose the optimal level of social connections that maximizes their present discounted expected lifetime utility. While in the second case, there is a specific level of investment in social connections that makes an agent indifferent between staying in the current city or moving to another one, and any deviation from this level would result in migration. Our framework shows that agents will not necessarily migrate from urban areas to small areas even if they take into account the similarity in wages and the differential in competition and living expenses. We also find that if there is any migration, only those agents that have a low stock of social capital will decide to move.

The rest of the paper is organised as follows. We describe the model in Section 2. Then, we present the equilibrium properties in Section 3. A numerical example that simulates the migration behavior of agents based on the model is presented in Section 4. Finally, Section 5 concludes.

2 The Model

2.1 Basic set up

The economy has two cities indexed by i, where i stands for either big (B) or small (S). The big city has a larger population, more job vacancies, higher wages, and more expensive living costs than the small one.

There is a large number of different jobs, J, allocated across the two cities, such that $J = \sum_{i \in \{B,S\}} J_i$. The number of vacant jobs in each city is represented by V_i, hence employment in each city is equal to $J_i - V_i$. Each period any job may be destroyed, and as a result, a worker would be laid off. The destruction of jobs results from idiosyncratic shocks that follow a Poisson process

oped look at Goyal (2007).

with parameter δ. Each period, the number of new jobs created is such that the total number of jobs is maintained.

There are L workers, who are infinitely lived, consider the same discount rate r, have a reservation value of zero for home production, and are allocated across the two cities. Workers have heterogeneous stock of social capital in the form of social connections. As is standard in the matching literature, we assume that the productivity of a worker-job match is an independent draw from some underlying distribution. For simplicity, we assume the Bernoulli distribution, where a match will result in productivity $\pi > 0$ with probability λ (in which case the worker is productive in the specific job offered by the employer), and the productivity is zero with probability $1 - \lambda$. Workers are either employed or unemployed at any moment, and they are free to choose in which city to live following individual rationality. Let E_i and U_i denote the number of employed and unemployed workers, then $L = \sum_{i \in \{B,S\}} E_i + \sum_{i \in \{B,S\}} U_i$.

Following Coles and Smith (1998), we assume that buyers and sellers can costlessly contact one other through a central marketplace. The marketplace provides the unemployed workers with complete information regarding each employer's job offer, just as happens in may real-life marketplaces were workers can interact directly with the companies that are offering jobs. The market operates over an infinite sequence of discrete time periods.

Rather than specifying a complicated price determination process, we consider a much simpler model[4] where if there is a productive match between an unemployed worker and at least one suitable job, the negotiated wage is $w = \theta\pi$, where $\theta \in (0, 1)$ is the worker's 'bargaining' power. If the worker is suitable for more than one of the jobs that are currently offered, we assume that the worker randomly chooses and picks one of those jobs. Similar assumptions apply to the employers.

In order to increase the probability of obtaining a job, the unemployed workers create links with employed workers who live in the same city. After a social tie is created, the employed worker can transmit information to his unemployed contact regarding potential vacancies in which the job seeeker would be productive. We assume that there are no links between workers in the same employment status. We use N to represent the degree, or number of links, of an unemployed worker.

2.2 Time and Events

Time, t, is discrete and infinite. Each period is composed of three sequential stages, as shown in figure 1. The economic decisions are taken and the interactions among agents occur in the order stated below:

[4] The reader who wishes to see a full-blown model of price determination should see Coles and Muthoo (1998). Taylor (1995) analysis a simpler, but related model.

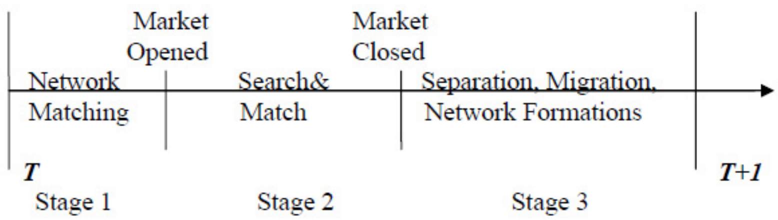

Figure 1: Time and Events

Stage 1. Before the matching market is opened, any job seeker may be informed of a potential offer by one of his connections. If the job seeker receives the information and accepts the offer, she becomes employed and starts to work in the next period. If more than one job opportunity arise during the same stage, the job seeker randomly picks one of the offers . On the other hand, if she turns down the offer, the vacancy is destroyed in the current period, and the employer has to create a new job in the next period.

Stage 2. The matching market is opened at the beginning of this stage, the unemployed workers search for a job and there are V job vacancies offered. During the same period of time the employed workers produce one unit of a consumable good. Those job seekers that are recruited during this stage leave the market place and start producing in the next period. At the end of the stage, the matching market is closed again, and then the unfilled vacancies are destroyed and the unmatched workers proceed, still unemployed, to the next stage.

Stage 3. At the beginning of this stage, the idiosyncratic separation shocks, result in the layoff of some employed workers. Finally, all the unemployed workers decide how many social connections N they want to build with employed workers, and in which city they prefer to live.

2.3 The Effect of Social Connections in the Unemployment Level

We assume that any employed worker will be informed of at most one job opportunity and will pass this information to only one of her unemployed connections. Since there is personal contact between the agents, the information will correspond to a position in which the job seeker will be productive given his specific characteristics; that is, the information provided to a job seeker corresponds to a secure match. A job seeker will be informed of a potential offer by one of his connections with independent probability α. Therefore, in stage one, an unemployed agent with links to N employed workers will get a job through the use of networks with probability $1-(1-\alpha)^N$. Any job offered at this stage will be immediately accepted. Suppose that there are F_{1t} total vacancies filled through this 'network hiring process', where the first subscript stands for the current stage and the second for the current period. The unemployed workers that fail to get a job during stage one will participate in the matching market and search for the potential vacancies to be filled.

Assume that $pU_t = F_{1t}$ of the initially unemployed workers find a job through networks during stage 1. Then, at the beginning of stage two, there are $U_{2t} = (1-p)U_t$ unemployed workers who participate in the matching process. Following Coles and Smith (1998), the probability that there is at least a worker that can fill a given vacancy and be productive on it is

$$P(\text{productive match}) = 1-(1-\lambda)^{U_{2t}}$$

Now, consider the probability that a particular unemployed worker in the market matches up with a vacancy during this stage. Suppose that there are V job vacancies available in the market at the moment it is opened. Then the probability of a match is determined by

$$h = \frac{V}{U_{2t}}[1-(1-\lambda)^{U_{2t}}]$$

As we mentioned before, all the workers that get a job either through networks or the matching market start producing in the next period, and all the unmatched workers remain unemployed after the market is closed at the end of stage two.

During stage three a proportion δE_t of employed agents are laid off. Therefore the change in the level of unemployment at the end of this period follows the difference equation shown below

$$\triangle U_t = \delta E_t - F_{1t} - F_{2t} + M_t$$

Where F_{2t} represents the number of matches during stage two, and M_t is the number of migrants, such that, if $M_t < 0$ there is an outflow from the local labor market, and if $M_t > 0$ the local city accommodates migrants from the other city. Then, it is convenient to calculate the steady-state level of unemployment as set by $\triangle U_t = M_t = 0$. We eliminate the subscript t, in order to represent the steady-state value of the state variables, as in $U_{t-1} = U_t = U$. Now, substitute $E = L - U$, F_{1t}, and $F_{2t} = hU_{2t}$

$$\delta(L-U) = pU + V[1-(1-\lambda)^{(1-p)U}]$$

We assume a symmetric equilibrium where every worker will invest to obtain the same number N of links, and in each period the total number of jobs created,

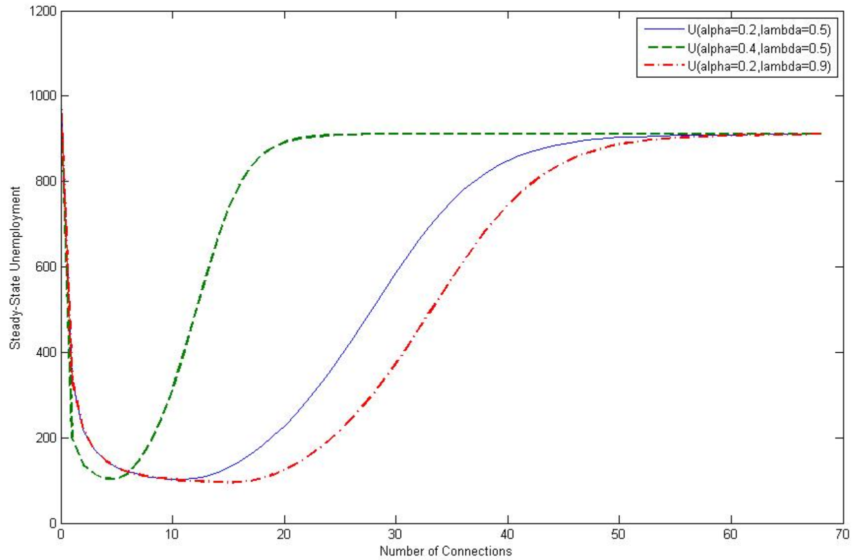

Figure 2: Unemployment and Social Connections

V, will be constant. Hence, substitute $p = 1-(1-\alpha)^N$, to obtain the following equation, which determines the level of unemployment in the steady-state[5]

$$\delta(L-U) = [1-(1-\alpha)^N]U + V[1-(1-\lambda)^{U(1-\alpha)^N}] \tag{1}$$

The above equation contains useful information regarding the effect of the number of connections on the steady-state level of unemployment. We performed a simple experiment with a level of participation equal to 10,000, a separation rate of 10%, 900 jobs created per period, $\lambda = 0.5$, and $\alpha = 0.2$. The resulting relationship between U and N is captured in Figure 2.

As can be seen in Figure 2, the effect of the number of social links per agent has a non-monotonic effect on the steady state level of unemployment[6]; this is a surprising result. At low levels of N, an increase in the degree of agents will result in a significant decrease in the unemployment level. However, once N crosses a critical level, $N = 10$ in this example, a further increase in N results

[5]In general, $p = 1-(1-\alpha)^N$ may not necessarily hold, due to clustering effects. However, Calvo-Armengol (2004) showed that this happens only for networks of a moderate size. Therefore, since we are considering a very large market, we can ignore the clustering effects and assume that on average the value of p will apply to all workers

[6]Albrecht et al (2003, 2004, 2006) studied the matching with multiple application, and find the similar non-monotonicity in number of job applications each job seeker can make. Although the partners in steady-state unemployment are similar but the underlying driving forces are different.

in an increase in the unemployment level. Then, as N increases from 10 to 50, unemployment rises from 1% to 9%.

The underling mechanism is that there are three different effects, *network effect*, *congestion effect*, and *thick market effect*, are inter-acting each other. The fist term in the right-hand-side of equation (1) captures the network effect. As α and N are larger the network effect is greater, hence $(1-p)U$ of job seekers in the market place is smaller. The probability of a job in the market place is productive P is increasing in the number of job seekers in the market (this is easy to see as $\partial P/\partial U > 0$). This is the so called thick market effect. However, the congestion effect of the matching market will drive down the hazard rate for individual job seeker as h function is decreasing in U as far as $0 < \lambda < 1$. In the market place, the thick market effect is always dominates the congestion effect, as we can see the second term of equation (1) is increase in U. With a moderate size of social connections, the network effect dominates the aggregate outflows of unemployment, therefore the steady-state unemployment is decreasing in N. As N continues to increase, the think market effect starts to dominate, as the job seekers at the second stage becoming less and less hazard rate is decreasing, and the steady-state unemployment starts to increase. After certain level of N, the the driving down force of network effect and pushing up force of thick market effect exactly canceled each other the unemployment is only determined by market paraments.

The above arguments become clearer when we change the market parameters. To increase the value of the probability of matching through networks, α, from 0.2 to 0.4, actually increased the network effect and the corresponding line in Figure 2 shows that the steady-state unemployment is decreases faster than before. However, an increase in λ from 0.5 to 0.9 results in a higher number of potential productive matchings in the market and a stronger thick market effect, and this makes the in creases in unemployment appear later on. Finally, in either cases, for large values of N, these two effects cancel, as is also shown in Figure 2.

3 Equilibria of the Model

3.1 Search Equilibrium

The equilibrium is characterized by the Bellman equations that define the worker's present discounted lifetime utility. Let Z_i denote the present discounted lifetime utility of an unemployed worker in city i as defined by

$$Z_i(N) = b - c(N) + \beta[f(N_i, V_i, U_i)W_i + (1 - f(N_i, V_i, U_i))Z_i(N)] \qquad (2)$$

$$\text{where} \quad f(N_i, V_i, U_i) = [1 - (1-\alpha)_i^N] + \frac{V_i}{U_i}[1 - (1-\lambda)^{U_i}]$$

is the job finding rate for a worker with N social connections. $c(N)$ is the cost of maintaining N social connections, $c'(.) > 0$, and $c''(.) > 0$. β is the discount factor. b is the unemployment benefit. And finally, W is the present discounted value for an employed worker, which is characterized by the following equation,

$$W_i = w_i + \beta[(1-\delta)W_i + \delta \max\{Z_i(N), Z_j(0)\}] \tag{3}$$

In the above equation w is the wage income paid to the employee, and $Z_j(0)$ is the present discounted lifetime utility for a migrant who moves from city j to city i, and hence abandons all her social connections in city i.

$$Z_j(0) = b + \beta[f(0, V_j, U_j)W_j + (1 - f(0, V_j, U_j))Z_j(N)] \tag{4}$$

Suppose that in a search equilibrium, $Z_i(N) \geq Z_j(0)$. Then insert (3) into (2) and solve for the equilibrium value of N_i^* such that

$$N_i^* = \arg\max_N Z_i(N) \tag{5}$$

The resulting N_i^* will determine the steady-state unemployment level in city i as defined by (1).

3.2 Migration Equilibrium

There is a migration equilibrium defined by a threshold $\overline{N}_i$, such that any worker living in city i will decide to move to city j as long as the number of her social connections is below this critical level, $N < \overline{N}_i$[7]. Hence the migration equilibrium is defined as

$$\overline{N}_i = \{N | Z_i(N) = Z_j(0)\} \tag{6}$$

Since $c''(.) > 0$, we know that $Z_i''(N) < 0$, and therefore $\overline{N}_i$ should be the smallest positive solution to $Z_i(N) = Z_j(0)$. A rational agent will decide to invest up to N_i^*, and it is will not necessarily happen that $N_i^* = \overline{N}_i$, in which case the search equilibria and the migration equilibria would coincide. In the model by Harris and Todaro (1972), as happens in most spatial searching models, the underlying mechanism considers that these two equilibria will be coincident. In our model, we have two different equilibria that arise as a result of the search and matching process, N_i^*, and as a result of the migration process $\overline{N}_i$.

Claim 1. *The equilibrium in a two-city migration model depends on the equilibria values N_i^* and $\overline{N}_i$, defined by (5) and (6), respectively. Three different cases may arise:*

[7] $Z_i(N)$ is increasing in N up to N^* as can be clearly seen in the numerical example provided in the following section.

1. *If $N_i^* > \overline{N}_i$, the unemployed workers with social connections below $\overline{N}_i$ will move from the big to the small city and invest in the creation of new links until they reach N_i^*; on the other hand, the unemployed workers with social connections above $\overline{N}_i$ will stay in the big city and accumulate N up to N^*.*

2. *If $N_i^* = \overline{N}_i$, the migration equilibrium and the search equilibrium coincide, and all the unemployed agents with connections below the equilibrium level will migrate to the small city and create new links up to $N_i^* = \overline{N}_i$.*

3. *If $N_i^* < \overline{N}_i$, only the highest of the solutions to $Z_i(N) = Z_j(0)$ is positive, hence for the relevant interval $Z_i(N) > Z_j(0)$, and every job seeker will decide to remain in the big city.*

4 A Numerical Example

Due to the fact that the degree of agents in equilibrium appears as an exponent in the relevant equations, it is not easy to obtain analytical results for our model. However, in this section we use computational methods, to illustrate the characteristics of the model and the dynamic-migration equilibrium. The parameter values used for calibration are listed in Table 1.

Table 1. Parameter Values

Parameter	Value	Parameter	Value
β	0.93	λ	0.4
w_B	1600	δ	0.1
w_S	1600	$c(N)$	$1/2N^2$
c_B	1500	b	750
c_S	650	V_S	366
V_B	377	α	0.2
U_B	400	U_S	370

Figure 3 shows the lifetime discounted expected utility for agents who are either employed or unemployed, and who are either living in a big city or small city, conditional on their stock of social connections. We can see that each value function is concave in N.

It is clear from Figure 3 that for any given degree of the agents, N, the highest welfare is obtained by workers employed in a small city, followed by those unemployed in a small city, then by those employed agents in a big city, and finally by those unemployed agents that live in a big city. As mentioned in Section 1, this result come from the higher living costs faced by agents living in a big city and the similarity in wages and unemployment benefits between the two cities. This is combined with less competition suffered in the small city's

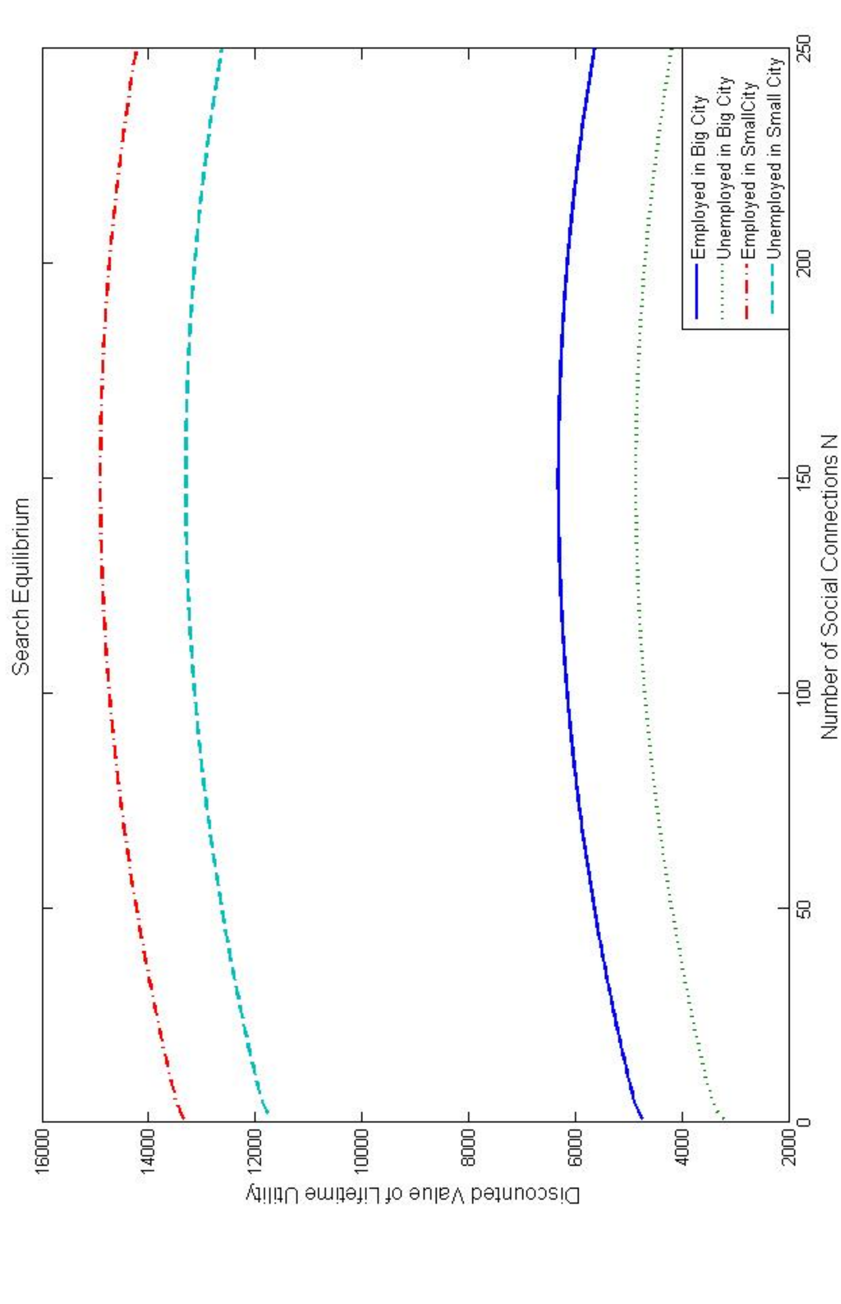

Figure 3: Value Functions

labor market, since the market tightness is higher ($V_S/U_S = 0.989$) in the small city compared to that in the big city ($V_B/U_B = 0.943$). Therefore, in principle, it is surprising that most agents decide to remain in the big city even when they would face better prospects in a small city independently of their employment status. However, once we consider the value of the stock of social connections that would be lost in case of migration, the logic behind may become clearer.

Figure 4 presents our main result. For the parameters selected, those unemployed agents with $N > 60$ will decide to stay in the big city, where they face the highest expected discounted lifetime utility. It is too costly for them to migrate to the small city, loose all their social connections, and start building a new social network. On the other hand, those agents with $N < 60$, will decide to migrate to the small city since their social network is not large and valuable enough to compensate for the lower expected lifetime utility that they face if they remain in the big city. The rational decision for them is to migrate, sacrifice a small number of links, and create a new social network.

5 Conclusion

In this paper we provide a possible explanation for the phenomenon of migration to big cities that takes place in China. It has been observed that many students that graduate from universities in big cities decide to stay there to look for their first job instead of going back to their hometowns. This occurs despite the fact that living costs are much higher in big cities, that competition for jobs is fiercer in big cities, and that recent graduates would be able to obtain similar starting wages in a small city.

We argue that part of the explanation rest in the use of social networks as a tool to obtain first jobs. We set up a model with two cities of different size where workers are heterogeneous in their idiosyncratic matching productivity. Because of the ex-ante uncertainty involved in job searching in the market, job seekers make use of social connections with employed agents that may provide them with useful information about vacancies that would be a good match given their specific characteristics. The agents that are not able to get a job through the use of social networks have to participate in the matching market. All agents have to decide their optimal investment in social connections, and wether to stay in a big city and make use of the social connections they already have or to migrate to a small city and invest in the creation a of a new network. We argue that the search equilibrium is not necessarily the same as the migration equilibrium. Hence, we claim that for migration to take place, the welfare gains from moving to a new city have to compensate the value of the social network that an agent would abandon. We provide a numerical example in which we show that our arguments can be supported by a reasonable calibration.

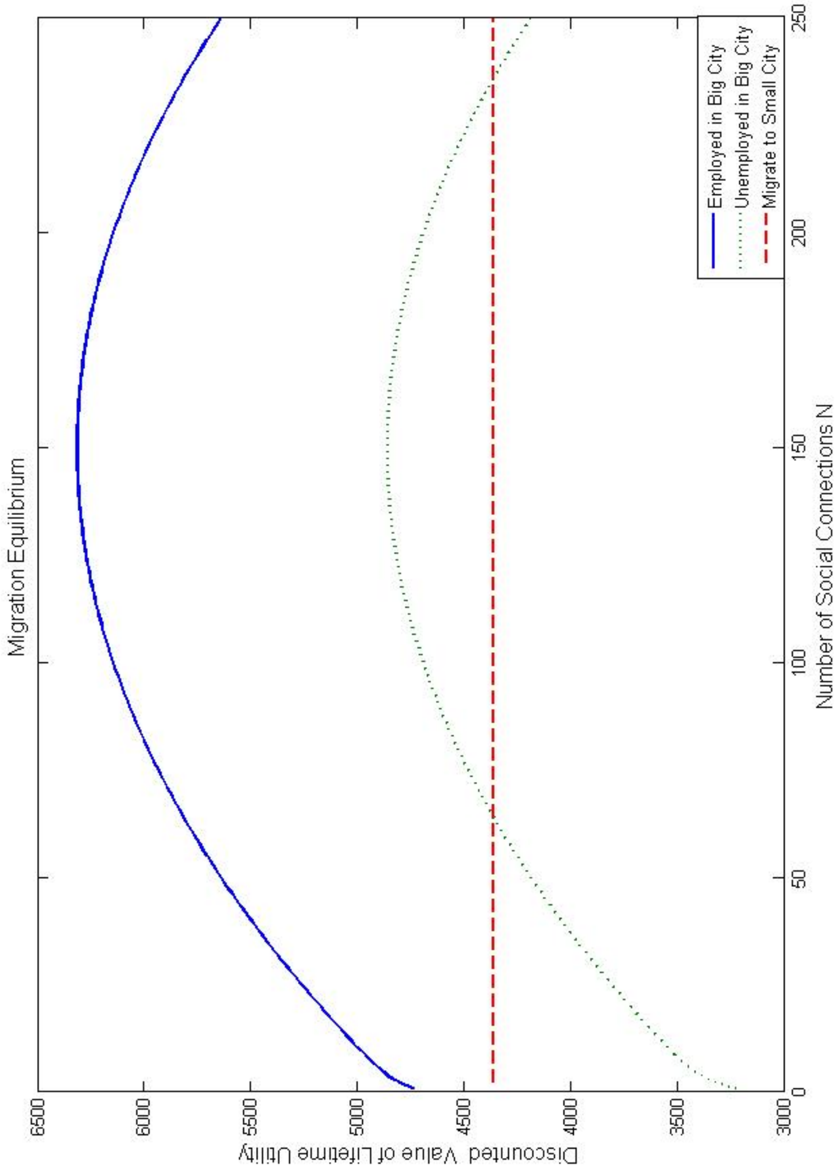

Figure 4: Migration Equilibrium

References

[1] Adda, Jerome and Russell Cooper, *Dynamic Economics, Quantitative Methods and Applications*, MIT Press, (2003).

[2] Albrecht, James W., Pieter A. Gautier, and Susan Vroman, "Matching With Multiple Applications" *Economic Letters*, (2003).

[3] Albrecht, James W., Serene Tan, Pieter A. Gautier, and Susan Vroman, "Matching With Multiple Applications Revisited", *Economic Letters*, (2004).

[4] Albrecht, James W., Pieter A. Gautier, and Susan Vroman, "Equilibrium Directed Search With Multiple Applications" *Review of Economic Studies*, (2006).

[5] Blau, David M. and Philip K. Robins, "Job Search outcomes for the unemployed and the employed," *Journal of Political Economy*, (1990).

[6] Burdett, Ken, Melvyn Coles, Nobuhiro Kiyotaky, and Randall Wright, "Buyers and Sellers: Should I Stay or Should I Go?," *AEA Papers and Proceedings*, (1995).

[7] Calvo-Armengol, Antoni, "Job Contact Networks," *Journal of Economic Theory*, (2004).

[8] Coles, Melvyn and Eric Smith, "Marketplaces and Matching," *International Economic Review*, (1998).

[9] Coles, Melvyn and Abhinay Muthoo, "Strategic Bargaining and Competitive Bidding in a Dynamic Market Equilibrium," *Review of Economic Studies*, (1998).

[10] Coulson, N. Edward, Derek Laing, and Ping Wang, "Spatial Mismatch in Search Equilibrium," *Journal of Labor Economics*, (2001).

[11] Galeotti, Andrea and Sanjeev Goyal, "A Theory of Strategic Diffusion," *Journal of Labor Economics*, (2001).

[12] Goyal, Sanjeev, *Connections: An Introduction to the Economics of Networks*, Princeton University Press, (2007).

[13] Granovetter, Mark, "The Strenght of Weak Ties," *American Journal of Sociology*, (1973).

[14] Harris, John R. and Michael P. Todaro, "Migration, Unemployment and Development: A Two-Sector Analysis", *American Economic Review,* (1972).

[15] Holzer, Harry J., "Search Method Use by Unemployed Youth," Mimeo, University of Essex, (2007).

[16] Molho, Ian, "Spatial Search, Migration and Regional Unemployment", *Economica,* (2001).

[17] Mortensen, Dale and Christopher Pissarides, "Job Reallocation, Employment Fluctuations, and Unemployment," (Chapter 18) in John B. Taylor and Michael Woodford (eds.), *Handbook of Macroeconomics* **Vol. 1B**,(North-Holland, Amsterdam., 1999 a), pp: 1171-1228.

[18] Mortensen, Dale and Christopher Pissarides, "New Developments in Models of Search in the labour Market," (Chapter 39) in Orley Ashenfelter and David Card (eds.) *Handbook of labour Economics* **Vol. 3B**, (North-Holland, Amsterdam, 1999 b).

[19] Montgomery, Janes D., "Social Networks and Labor-Market Outcomes: Toward an Economic Analysis," *American Economic Review*, (1991).

[20] Myers, Charles A., and George P. Schultz,*The Dynamics of a Labor Market*, Prentice Hall, (1991).

[21] Pissarides, Christopher. A., *Equilibrium Unemployment Theory,* second edition, MIT Press, (2000).

[22] Rogerson, Richard, Robert Shimer, and Randall Wright, "Search-Theoretic Models of the Labour Market: A Survey," *Journal of Economic Literature*, (2005).

[23] Romer, David, *Advanced Macroeconomics,* 2nd edition, McGraw-Hill Higher Education, (2001).

[24] Taylor, C.R., "The Long Side of the Market and the Short End of the Stick: Bargaining Power and Price Formation in Buyers', Sellers' and Balanced Markets," *Quarterly Journal of Economics*, (1995).

[25] Todaro, Michael P. and Stephen C. Smith, *Economic Development,* 9th edition, Pearson Education, (2006).