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NONMARKET NETWORKS AMONG MIGRANTS: EVIDENCE FROM METROPOLITAN BANGKOK, THAILAND

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Abstract

This paper examines nonmarket interactions among migrants from same origins in the urban labor market of Bangkok, Thailand. We test whether the labor-market performance of previous migrants has externalities to that of new migrants who moved from the same province of origin. Our empirical results, which control origin fixed effects, time-fixed effects, and origin/year-specific correlated shocks, show that (1) the relative size of the migrant population in the market decreases employment probabilities of new migrants (negative substitution effect), (2) the employment probability of previous migrants increases those of new migrants (positive externalities), and (3) when the employment probability of previous migrants approaches to unity, the size effect becomes positive, showing informational scale economies. The results imply that the positive informational scale effect dominates the negative substitution effect when the efficiency of previous migrants is sufficiently high in the labor market.

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1. Introduction

Upon arrival in a new location, migrants learn about their destination not only by themselves but also from others who have migrated from the same origins. Job searching in labor markets is no exception. To search for jobs, migrants collect information from a variety of sources through both market and nonmarket channels. They can learn from vacancy postings at formal job banks as well as more informally from networks of friends and neighbors. These local networks include those who have moved from the place of their origin.

The information flow seems particularly strong among those who have originated from the same place (e.g., Banerjee 1983). If information spills over from more- to less-experienced migrants (just as skills are transmitted from older to younger workers), the information path may create path dependence among migrants. The success of previous migrants in the destination market affects the expected economic value of migration, which influences not only the decision to migrate but also, more directly, the labor-market performance of those who subsequently move, if previous migrants help new migrants. We examine the extent to which the latter effect works. If previous (experienced) migrants inform newly arrived (less experienced) migrants of job opportunities, the scale and efficiency of the previous migrants affect those of the recent migrants.

To assess empirically the above-mentioned nonmarket interactions, we use micro data of employment status from a metropolis in a developing country: Bangkok, Thailand. For the purpose of this study, Bangkok has some desirable features. First, the nonmarket externalities are supposed to be stronger in developing countries than in developed countries. This is because in many low-income countries, the formal information infrastructure is not yet well developed, and therefore, informal nonmarket networks likely substitute for the formal institutions that exist in developed countries.

Second, the city of Bangkok is the single largest metropolitan area in Thailand and is where not only physical capital and technologies, but also human capital, are

concentrated. In terms of domestic product, the scale of economic activities is far larger than any other urban cluster. Historically, a large-scale migration of labor flows into Bangkok. From an analytical point of view, the exclusive focus on this large city avoids potential heterogeneities of labor-demand structure that may come up if we pool different cities in the analysis.

Third, related to the second point, the share of migrants is quite large in the Bangkok population. In 1994–1996, nearly 20 percent of the population had been there fewer than nine years; 13 percent had stayed under five years (Rounds 1 and 3, Labor Force Surveys). For our purpose, the large share of migrants in the Bangkok population helps identify the role of migrants' networks in the labor market.

In labor economics, studies of neighborhood or network effects focus attention on demographic behavior, schooling investment in children, or other social phenomena such as crime. However, since these network effects are unobservable to researchers, it is often difficult to distinguish these external effects from unobserved common factors or correlated shocks. More fundamentally, it is hard to define reference groups (Manski 1993). For example, in different contexts, Case (1992), Case and Katz (1991), Foster and Rosenzweig (1995), Topa (2000), and Yamauchi (2001) examine external effects among residents living in the same areas. Borjas (1995) and O'Regan and Quigley (1996), on the other hand, provide evidence for external effects among people identified with the same characteristics, such as ethnic background. In this paper, the network effect we examine is of the latter type, since the reference group is defined by migrants' origins.

The literature on migration has made some progress in the question of identifying the network effects among migrants.[1] Banerjee (1983) shows from a survey in Delhi that network effects exist in decisions to migrate and in the job search. Caces et al. (1985) examine migration from the Philippines to Hawaii, showing evidence of migrants'

[1] Although these studies have a static framework, the implications of the nonmarket network effect can be also dynamic. In a dynamic sense, the nonmarket interactions may enhance human capital accumulation. If skill accumulates when migrants work, skill formation depends on the employment status, i.e., whether or not they work. Therefore, the strength of the network affects the accumulation of specific human capital.

network effects. Montgomery (1991) shows the importance of informal networks, including social networks, in employment determination. Using the concept of ethnic capital, Borjas (1995) examines the effect of previous migrants' characteristics on more recent migrants by their ethnic background in the United States. More recently, Munshi (2003) identifies network effects among Mexican migrants in the United States, using retrospective data on migration and employment history. In particular, his analysis succeeds in controlling for the effects of correlated shocks among migrants from the same origins, using regional rainfall data from the area of the migrants' origin in Mexico.

In this paper, we examine more specifically whether the population size and efficiency of previous migrants affect employment prospects of recent migrants from the same origins in the Bangkok labor market. In this paper, size is measured by the relative share of migrants from a particular area in the migrants' whole population. Efficiency is measured by the employment probability estimated among the group of migrants from a particular area. The data come from nonagricultural and agricultural seasons of the Thai Labor Force Survey 1994–1996. To identify this effect, we control for (1) origin province-specific fixed effects, (2) time-specific common shocks, and (3) origin province-specific year shocks. Evidence shows that (1) the size of the migrant population has a negative effect on employment probability among recent migrants, due to substitution between previous and recent migrants from the same place of origin. However, (2) higher employment probability among previous migrants increases employment probability among recent migrants. This result suggests that migrants gain from those who are currently employed but not from those who are not. Moreover, (3) the two factors are complementary in the sense that when employment probability is high enough among previous migrants, the size effect becomes positive. Therefore, there

exists a threshold in the number of previous migrants, above which the negative substitution effect is dominated by the positive external effect.[2]

In the next section, we discuss a simple framework to clarify theoretical predictions. The empirical methodology is discussed in Section 3. Section 4 describes data from Thailand, and Section 5 summarizes empirical results. Section 6 presents concluding remarks.

2. A Simple Framework

In this section, we discuss migrants' information acquisition behavior in a simple model. Our main question is twofold: (1) are migrants influenced by previous migrants from the same area? And (2) if so, are they influenced by competition in the same market or positive learning spillovers that enhance the job search?

The first question assumes that the labor market for migrants is somehow segmented between groups of different origins. Markets can be segmented by occupation and industry or by information flow. For example, if migrants who moved from a particular region tend to engage in a certain industry, new migrants likely compete with those who have already stayed in the destination, whether employed or not. If there is no such segmentation, the total labor supply in the destination matters in the labor market equilibrium and the probability of finding a job. The size of previous migrant and native labor forces has a negative effect on the employment probability of newly arrived migrants.

On the other hand, a large pool of previous migrants may increase the employment probability of recent migrants, if the network of migrants from the same origin helps recent migrants find jobs. Assume that migrants receive signals on their job-search strategy from previous migrants $\{j\}$ from the same origin, $y_j = \theta + \varepsilon_j$, where θ is

[2] However, the network effect in general equilibrium of the labor market as a whole depends on the substitutability between migrants and nonmigrants, because more employment among migrants can reduce opportunities for nonmigrants. In this paper, we restrict our focus on network effects among insiders (migrants), not including those on outsiders (natives).

the parameter that represents the best job-search strategy and ε_j is stochastic noise, following $iid \;\; N(0,\sigma_\varepsilon^2)$. The signal does not tell about the best strategy perfectly. The actual search strategy taken is z^*. The optimality of this strategy is measured by a quadratic loss function $(\theta - z^*)^2$.

Assume that employed migrants have better information on where to find a job than unemployed migrants do. Indeed, employed workers have already gone through a successful job search. In Bayesian inference, this informational heterogeneity is translated into difference in noise variance, i.e., unemployed agents have a larger noise variance of their signals. Assume that the variance of noise, ε_j, is larger in unemployed than in employed migrants, i.e., $\sim \sigma_\varepsilon^2 > \sigma_\varepsilon^2$, where $\sim \sigma_\varepsilon^2$ is the variance for unemployed migrants and σ_ε^2 is that for employed migrants. In words, signals from the unemployed are less reliable than those from the employed.

With normality assumptions on the prior on θ, agents minimize the expected value of the quadratic loss. In Bayesian terms, newly arrived migrants set their strategy at the sample average of signals. Since noise variance is smaller in the group of employed previous migrants, they will start sampling from this group. Let us analyze the condition for additional sampling. Given that a sample of size k is already taken to form z^*, the benefit of additional sampling $k + 1$ is represented by a reduction of the subjective variance.[3] Since

$$-y_{[1,k+1]} = \frac{k - y_{[1,k]} + y_{k+1}}{k+1},$$

we obtain

[3] In this paper, we assume that learning occurs in one shot. However, it is easy to model multi-period learning by which agents update their perceptions over time.

$$\Delta V_{k,k+1} \equiv Var(\theta \mid \{y_j\}_{j=1}^{k}) - Var(\theta \mid \{y_j\}_{j=1}^{k+1})$$
$$= \frac{\sigma_\varepsilon^2}{k} - \left[\left(\frac{k}{k+1} \right)^2 \frac{\sigma_\varepsilon^2}{k} + \frac{\sim \sigma_\varepsilon^2}{(k+1)^2} \right].$$

The condition under which $\Delta V_{k,k+1} > 0$ is

$$\left(2 + \frac{1}{k} \right) \sigma_\varepsilon^2 > \sim \sigma_\varepsilon^2.$$

Therefore, as long as the noise variance from the $k+1$-th sample migrant is not so large, it is optimal for recent migrants to learn from more migrants. Needless to say, if the $k+1$-th migrant is currently employed, the condition holds.

The employment probability is a function of the job-search strategy loss, the population size of previous migrants, and natives in the destination:

$$p\left((\theta - z^*)^2, L_o^p, L_{-o}^p, L \right),$$

where L_o^p, L_{-o}^p, L denote the populations of previous migrants from own origin and other regions, and of natives, respectively. The effect of L_o^p on p is

$$p_1 \frac{\partial (\theta - z^*)^2}{\partial L_0^p} + p_2 \ ,$$

where p_m is the derivative with respect to m-th argument, and $\frac{\partial z^*}{\partial L_0^p}$ depends on the composition of the employed and unemployed. From the above theory, if an increase in L_0^p consists of employed workers, recent migrants are likely to sample them. *On average*, the variance of $(\theta - z^*)^2$ decreases, so p increases. In the competitive labor market, p_2 is negative. Similarly, p_3 and p_4 are also negative.

In the empirical analysis below, we use (1) the relative number of previous migrants from the same province of origin (i.e., $\frac{L_o^p}{L_o^p + L_{-o}^p}$), and (2) the estimated employment probability of previous migrants from the same province of origin (i.e., the ratio of the employed to the total population of previous migrants from the same province of origin). First, given that the employment probability of previous migrants increases p, the interaction of (1) and (2) also increases p. Second, given that since the term $p_1 \frac{\partial z^*}{\partial L_0^p}$ is controlled, the effect of (1) is negative. The following sections provide further details on empirical implementation and data.

3. Empirical Methodology

Specification and Identification

In this section, we discuss the methodology to identify the network effects among migrants. We use the probit model, taking the dependent variable from the employment status of recent migrants who have stayed in Bangkok less than one year. The employment status takes the value of 1 ($y_{it} = 1$) if the worker is employed and zero otherwise ($y_{it} = 0$). In particular, we assume that

$$y_{ijr}^* = \alpha + x_{ijr}'\beta + z_{jr}'\gamma + \mu_j + \nu_r + \phi_{jt} + \varepsilon_{ijr},$$

where i, j, r, and t denote individual, province of origin, round, and year, respectively. There is more than one round in a year. In this setting, $y_{ir} = 1$ if $y_{ir}^* \geq 0$ and $y_{ir} = 0$ if $y_{ir}^* < 0$ where y_{ir}^* is a latent employment state variable. There are two sets of explanatory variables above: individual and household characteristics, x_{ir}, and network factors specific to the province of origin, z_{jr}. The error term, ε_{ijr}, follows the standard normal distribution. As discussed below, z_{jr} is either the (normalized) number of previous migrants from same origin r, or estimated employment probability of previous migrants. The previous migrants are defined as those who have stayed in Bangkok more

than one but fewer than five years. Individual and household characteristics, x_{ir}, have age, gender, marital status, household size, levels of education completed, and household head indicator.

In this type of empirical exercise, it is challenging to identify origin group-specific externalities against the group-specific unobserved fixed factors and/or common shocks correlated among the group members. For example, if the quality of education is higher in a particular region than in other regions, those who come from that region are more likely to be employed than those from other regions. Since this hidden factor affects both previous and recent migrants, the presence of a positive correlation occurs between the two groups. Therefore, if such a region-specific effect is not controlled for in estimation, there is a risk of accepting this positive relation as statistical evidence of externalities. Since those unobserved region-specific factors are contained in unobserved error terms, it is likely that origin-specific externality variables, i.e., the size of previous migrant population or the estimated employment probabilities among previous migrants, have correlations with the error terms.

In this paper, this problem is solved through (1) pooling several cross-sections over time ($r = 1,...,6$) and (2) including origin fixed effects, μ_j. Using panel data or pooling data from several cross-sections that have time-series variations for each group, region-specific fixed effects can be estimated by a region dummy variable. It should also be noted that the external effects estimable in the above method are identified only from within-province variations, not from differences in employment status across different origin provinces.

Another issue relevant in the identification of externality effect is that shocks correlated among migrants from the same origin change the dependent as well as the network variables at the same time. There are two types of correlated shocks: supply-side shocks in origin provinces and demand-side shocks in Bangkok. Among supply-side shocks, agricultural production fluctuations are a major stochastic factor. Since we pool agricultural (August) and nonagricultural (February) season rounds from each year, we

can include origin province year-specific (not round-specific) indicators to capture the monsoon-related province-specific agricultural shocks. In the peak agricultural season round, migrants may move back to rural origins to work on agricultural production. Weather conditions can affect the employment opportunities in rural areas. With province- and year-specific dummy variables, therefore, we can control for these stochastic conditions.

On the demand-side shocks in the labor market, we do not assume heterogeneities among migrants from different origin provinces. This assumption is quite acceptable, except in some industries (e.g., food processing) that are linked closely with agricultural production. In manufacturing industries in general and service sectors, while demand shocks can differ between sectors, they equally affect migrants from different regions. In the analysis below, it is assumed that labor demand can shift round by round and uniformly between migrants from different origins. Round-year indicators capture these demand-related shocks.

Scale Effect and Efficiency Effect

As discussed, we examine two types of nonmarket network variables: (1) the normalized size of previous migrants from the same origin in the migrants' total population, and (2) the estimated employment probability of previous migrants by province of origin. The former measures the scale of migration from a certain province of origin, while the latter measures the efficiency in labor market activities among previous migrants.

There are two possible size effects, following the conventional framework in labor economics. First, if previous and new migrants are simply substitutes in labor markets, more previous migration from the same origin makes it difficult for new migrants to find jobs in the same markets, given the labor demand. In this case, the size effect is negative. Second, the expansion of migrants' population from the same origin may create informational economies of scale, which may dominate the negative

substitution effect. The more migrants that settle in the destination, the more information emerges due to increasing interactions among the migrants. In this case, the size effect is positive. Therefore, we cannot predict a priori the sign of the size effect. However, in general, the question of whether previous and new migrants are substitutes depends on labor-market structure as well as heterogeneity in quality of labor.

On the other hand, we expect the efficiency effect to be positive, since newly arriving migrants can learn about employment opportunities from those who are currently employed in the same market. We can also conjecture that higher labor-market efficiency of previous migrants enhances informational scale economies. In the estimation to capture this effect, we include the interaction term of the estimated employment probability and the migrant population size by province of origin.

4. Data

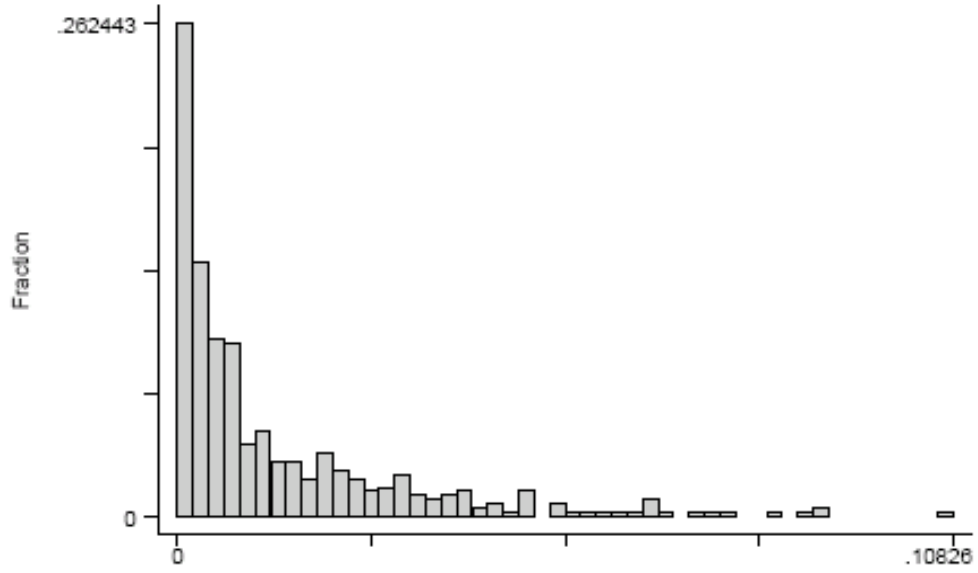
Labor Force Survey

This paper uses the Labor Force Survey conducted by Thailand's National Statistical Office (NSO) in the years 1994 to 1996. The Labor Force Survey is conducted every quarter: February, May, August, and November. This paper uses data from February (first round) and August (third round) in the three years cited to include nonagricultural and peak agricultural seasons each year. For the purpose of this research, we use only the Bangkok sample. The years 1994–1996 are regarded as boom years, before the Thai financial crisis of 1997–1998.

The Labor Force Survey provides rich information on employment, such as working hours, payment types, wages, fringe benefits, and so on. Among them, detailed data on migrants such as origin, length of stay in destination, and reasons for migration are available. The labor force is defined as those who are able to work, excluding housekeepers or students. Migrants are defined as people who have lived in the Bangkok region fewer than five years, after having moved from non-Bangkok regions. The survey identifies the length of residence in the destination up to nine years. However, previous

provinces are only recorded for those who have stayed fewer than five years, which makes our definition of migrants restricted to those as described above. Migrants' origins—previous provinces—are divided into 76 provinces; foreign countries are another one category. The distribution of migrants by origin regions is shown in Figure 1. The percentage coming from the north is 20.19 percent of all migrants; from the northeast, 11.08 percent; from the south, 21.54 percent; and from the central, including Bangkok, 25.80 percent.

Figure 1—Normalized migrants' size, by origin and round-year



Six years of elementary school was compulsory from 1994 to 1996. At higher than elementary levels, junior high school and high school take three years for each, and college requires four years. Medical and dental schools require six years. In Thailand, there are three types of vocational schools. Students can enter after junior high school (three years) or after high school (two years). We use the following education indicators: none, less than Pratom 4, lower elementary, elementary, lower secondary, upper secondary, lower vocational, upper and higher vocational, university academic, university technical vocational, teacher training, short-course vocational, and other.

Network Variables

Network variables used in our estimation are (1) the normalized share of migrants from a particular province in the total population of migrants in Bangkok at a given point in time, and (2) the share of the employed that moved from a particular province among migrants from the same province in Bangkok at a given point in time. To estimate the number of migrants from a particular province, we need sample weights and the estimated total number of migrants' population in Bangkok at each round from 1994 to 1996. To construct the normalized share, we use the ratio of migrants from a particular province to the Bangkok migrants' population using sample weights. That is,

$$R_{jt} = \frac{\sum_{i \in n_{jr}, length \in [1,5)} w_{ir}}{\sum_{i \in n_r, length \in [1,5)} w_{ir}} ,$$

where w_{ir} is sample weight for migrant i and round/year r, n_{jr} is the group of people from origin j who have stayed in Bangkok more than one year but fewer than five years, and n_r is the group of people who migrated from outside Bangkok and have stayed more than one year but fewer than five years. By definition,

$$n_r = \sum_j n_{jr} .$$

We also calculate the employment probability among the people from a particular region j:

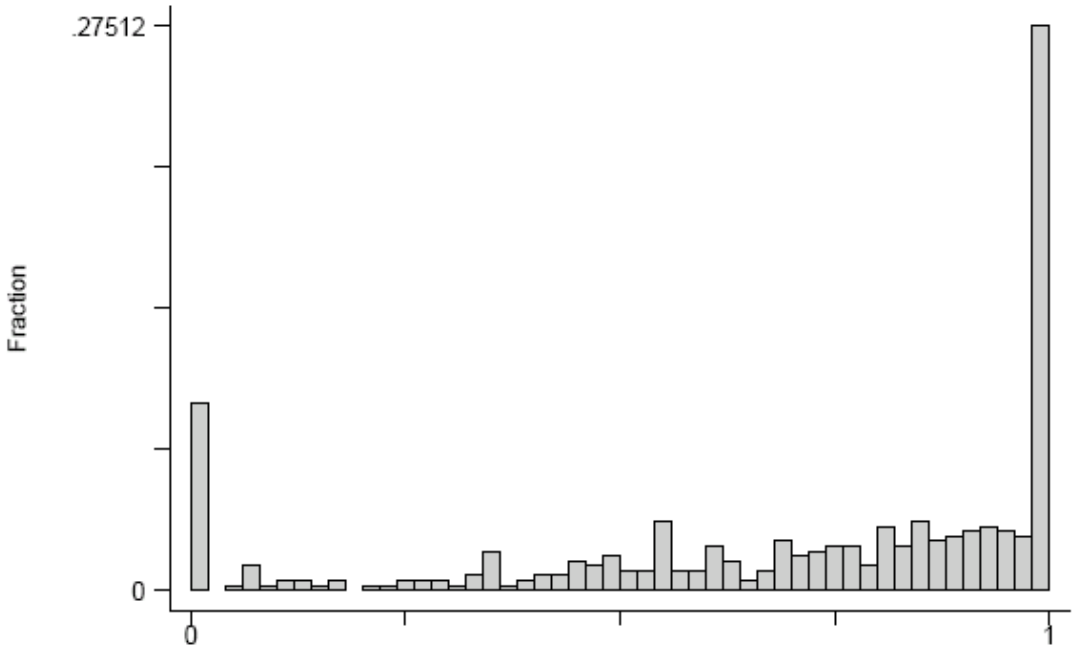
$$P_{jr} = \frac{\sum_{i \in n_{jr}, length \in [1,5)} w_{ir} y_{ir}}{\sum_{i \in n_{jr}, length \in [1,5)} w_{ir}} .$$

We will analyze the effects of these two network variables on the employment probabilities of recent migrants—those who have stayed in Bangkok less than one year.

Figures 1 and 2 display the distributions of these two origin-specific network variables. The graphs show that employment probabilities by rounds and origin provinces are nearly uniformly distributed but with two mass points at extreme values,

while the normalized share is concentrated in small values (nearly 63 percent of the origin provinces are less than 0.01, where the maximum is 0.1083).

Figure 2—Employment probability, by origin and round year

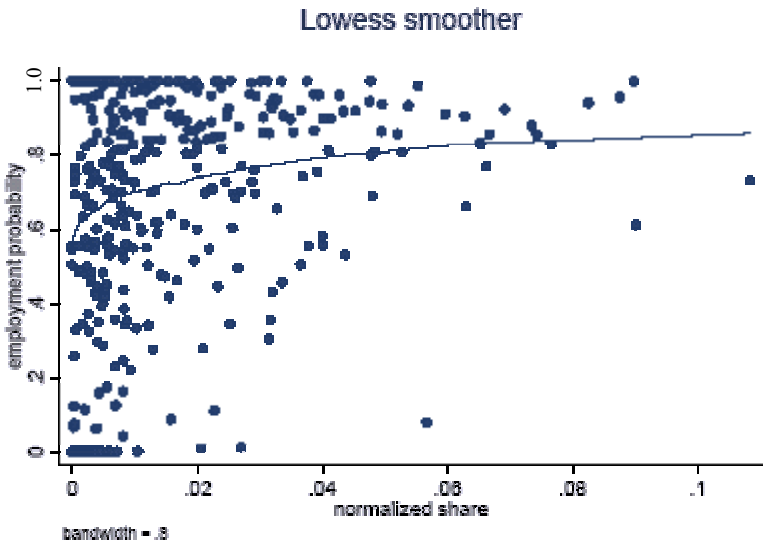


Next, Figure 3 displays a positive relationship between the employment probabilities and the normalized shares.[4] The positive correlation between these network variables implies two phenomena. First, the self-selection process screens more employable agents, and therefore a higher employment probability in the group of migrants from a particular region results in its relatively larger size. Second, if there exist informational scale economies in the destination, a higher employment probability results in a larger number of migrants. This process is circular: higher employment probability induces more migration and therefore a larger population size. In our empirical strategy,

[4] It also shows that the variance of employment probability is large if the relative population size is small. Though in this paper we do not examine this phenomenon, part of this variation must be attributable to sampling errors that may arise from small samples of these relatively small shares of migrants in the destination.

the first possibility can be controlled for by origin-province fixed effects and the interactions with year indicators, if the propensity to migrate does not change between the two rounds in each year.

Figure 3—Size and efficiency of network



However, the positive correlation is not consistent with the selection process in the destination. If the selection process in the destination gradually screens employable migrants, the average employment probability will be higher, but the population size of migrants who survive in the destination will be smaller as time passes. In this case, therefore, we expect a negative correlation.

The next section summarizes econometric results.

5. Estimation Results

This section shows our estimation results. All the specifications include three fixed effects: (1) origin-province fixed effects, (2) origin-province year-specific effects, and (3) round-year effects. With the first two effects, both unobserved common fixed

factors and correlated shocks specific to origin provinces are controlled for to avoid spurious inference of external origin-specific network effects. With the time-specific fixed effects, labor demand as well as macroeconomic shocks are controlled.

Table 1 shows results from benchmark specifications that use previous migrants age 13 or higher. In the first and second columns, we include only the normalized size of previous migrants from the same origin. While the linear effect is insignificant, the

Table 1—Probit: Employment equations using previous migrants age 13 or higher

Dependent: employed or not	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Size	0.0407	12.110			–18.550
	(0.02)	(1.94)			(1.84)
Size squared		–123.87			–91.038
		(2.26)			(2.07)
Employment probability			0.1877	1.9678	2.3617
			(0.74)	(1.42)	(2.24)
Employment probability squared				–1.2877	–2.2565
				(1.30)	(2.34)
Size * employment probability					30.995
					(2.87)
Age	0.0325	0.0354	0.0315	0.0330	0.0357
	(0.96)	(2.09)	(1.82)	(1.92)	(2.15)
Age squared	–0.0005	–0.0005	–0.0004	–0.0005	–0.0005
	(2.01)	(2.28)	(1.96)	(2.09)	(2.38)
Male	0.0676	0.0736	0.0630	0.0643	0.0774
	(0.96)	(1.08)	(0.91)	(0.94)	(1.15)
Head	0.1360	0.1340	0.1336	0.1333	0.1209
	(3.38)	(3.38)	(3.38)	(3.39)	(2.96)
Single	0.1736	0.1742	0.1742	0.1661	0.1714
	(3.100	(3.36)	(3.16)	(3.00)	(3.31)
Household size	–0.0087	–0.0081	–0.0083	–0.0076	–0.0063
	(0.81)	(0.77)	(0.78)	(0.71)	(0.63)
Education indicators	Yes	Yes	Yes	Yes	Yes
Origin province fixed effects	Yes	Yes	Yes	Yes	Yes
Round-year fixed effects	Yes	Yes	Yes	Yes	Yes
Origin-province year fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	531	531	521	521	521
Pseudo R square	0.4851	0.4904	0.4857	0.4882	0.5024

Notes: The parameters shown are changes in probability. The numbers in parentheses are asymptotic t values. Robust standard errors are used with origin province-wise clusters. The specifications include indicators of the level of education completed, origin-province fixed effects, round-year fixed effects, and origin-province year fixed effects. Size is the normalized share of migrants from a particular province in the migrants' total population.

positive concave effect is significant with a quadratic term. It appears that the positive informational-scale economy effect dominates the labor-market substitution effect.

In the third and fourth columns, both linear and quadratic effects of the employment probability are insignificant. This goes against our prediction that currently employed migrants can improve employment probability for newly coming migrants. However, this specification does not reflect possibilities of interdependence between migrants' population size and their efficiency in the labor market.

In the fifth column, we adopt a quadratic approximation with both normalized migrants' size and employment probability, including their interaction term. The results are that the (1) size effects are negative and convex, (2) employment probability effects are positive and concave, and (3) interaction effect is positive. All these estimates are significant.

The first result suggests that previous migrants are substitutes for recent migrants from the same origins in the Bangkok labor market. With a large pool of previous migrants, it becomes difficult for recent migrants to find a job. It is possible that labor markets are segmented across migrants of different origins, and the quality of labor is similar between previous and recent migrants.

The second result implies that if new migrants are interacted with more efficient workers (those with jobs), the likelihood of finding a job is greater. This finding supports our main hypothesis that employed migrants who have already stayed for a certain period are a key information source for newcomers in the destination market. However, the marginal effect becomes nearly zero as the probability approaches 1.

More interestingly, the efficiency of previous migrants alters the negative substitution effect of the migrants' population size. The positive sign of the interaction term means that more efficient migrants enhance informational scale economies. As the employment probability of previous migrants approaches to unity, the size effect becomes positive. Hence, if most of the previous migrants are employed in Bangkok, their population size enhances employment opportunities for newly coming migrants.

In Table 2, we check the robustness of our key results in two ways. First, the length of labor-market experience may change the effectiveness of the reference group as an information source. For example, more experienced migrants are not only more likely employed, they also become a more efficient information source, since those workers know more about working conditions in general. In order to check the effect of the heterogeneities, we construct two network measures for different subpopulations of previous migrants: those age 18 or higher and those age 25 or higher. The first and second columns show quadratic approximation results, comparable to the fifth column in Table 1, using previous migrants of age 18 or higher, and 25 or higher, respectively.

Table 2—Probit: Employment equations

Dependent: employed or not	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Size and employment probability are defined with	**Age > 18**	**Age > 25**	**Age > 13**	**Age > 18**	**Age > 25**
Size	–36.430	–14.180	–18.874	–38.554	–16.927
	(2.45)	(2.00)	(1.86)	(2.15)	(1.87)
Size squared	–103.40	26.870	–89.180	–109.59	17.369
	(2.11)	(0.64)	(2.05)	(2.25)	(0.36)
Employment probability	1.0668	2.9959	3.1120	1.2011	3.4192
	(0.97)	(1.97)	(2.35)	(0.83)	(2.12)
Employment probability squared	–1.2815	–2.0627	–2.5798	–1.4493	–2.3427
	(1.23)	(1.85)	(2.55)	(1.29)	(2.02)
Size * employment probability	47.762	10.629	29.610	49.159	13.339
	(2.53)	(1.22)	(2.58)	(2.41)	(1.34)
Years schooling * size			0.5807	0.4258	0.2706
			(1.08)	(0.83)	(0.68)
Years schooling * employment probability			0.0105	0.0371	0.0151
			(0.19)	(0.63)	(0.33)
Age * size			–0.0658	–0.0529	–0.0369
			(0.60)	(0.48)	(0.49)
Age * employment probability			–0.0090	–0.0007	–0.0091
			(0.67)	(0.05)	(1.18)
Male * size			–0.0131	0.3164	0.5297
			(0.00)	(0.10)	(0.25)
Male * employment probability			–0.3917	–0.3431	0.1669
			(1.31)	(1.27)	(0.70)
Origin-province fixed effects	Yes	Yes	Yes	Yes	Yes
Round-year fixed effects	Yes	Yes	Yes	Yes	Yes
Origin-province year fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	521	503	521	521	503
Pseudo R square	0.4939	0.4885	0.5168	0.5033	0.4973

Notes: The parameters shown are changes in probability. Age, age squared, education level, male, head, single indicators, and household size are included. The numbers in parentheses are asymptotic t values. Robust standard errors are used with origin province-wise clusters. The specifications include indicators of the level of education completed, origin-province fixed effects, round-year fixed effects, and origin-province year fixed effects. Size is the normalized share of migrants from a particular province in the migrants' total population.

Estimates are quite similar to the benchmark result (Table 1, column 5) in signs of the parameters, except a few differences in the level of significance. The results show (1) negative and convex effects of migrants' size, (2) positive and concave effects of migrants' efficiency, and (3) complementarity between the population size and efficiency of previous migrants. Key findings seem to remain robust to this experiment.

Next we check how individual attributes alter the efficiency of information acquisition from previous migrants' networks. Years of schooling, age, and gender indicators are interacted with both the normalized size and employment probability. The level of education measures general human capital, which may enhance information acquisition from existing networks, as is the ability to deal with disequilibria (Schultz 1975). Age is also included to represent labor-market experience, which may also enhance the utilization of informational flows through networks. Note that since we use as the source group those of destination experience fewer than five years, age mainly captures the labor-market experience in their origins. The results are shown in columns 3, 4, and 5. The estimates are not significant enough to reach any conclusion on the above hypotheses. Education, age, and gender do not matter in learning from networks. This result conflicts with a finding by Yamauchi (2004) that educated migrants learn efficiently from their destination experience in the Bangkok labor market.

6. Conclusion

This paper shows that an external effect exists in the channels from previous migrants to newly arrived migrants of the same province of origin. In the Bangkok labor market, the employment probability of recent migrants is affected by both the population size and efficiency of previous migrants originating from the same region. A large population size of previous migrants per se decreases employment opportunities among new migrants, while more employment among previous migrants raises the employment probability of new migrants. The above results imply that previous and recent migrants are substitutable in the Bangkok labor market and that the key information source for

recent migrants is those who are currently employed. More interestingly, when previous migrants are highly efficient, a large population size of previous migrants enhances employment prospects among newly arrived migrants. Only when most previous migrants are employed in the market does the size of the local network exhibit information scale economies.

The evidence for the migrants' nonmarket interactions is robust to unobserved factors that easily create correlations between the network variables and employment status of recent migrants: (1) origin-province fixed effects, which eliminate spurious correlations due to unobserved region-specific fixed factors, (2) origin-province year-specific effects, which reflect supply-side shocks correlated among same-origin migrants, e.g., fluctuations in agricultural production in the province of origin that alter opportunity costs of being in Bangkok, and (3) time-specific common shocks, which affect all migrants both previous and recent and from any regions at the same time.

The period covered in this analysis corresponds to three years immediately before the Thai financial crisis of 1997. Some evidence shows a structural change in the Bangkok labor market during this crisis: returns to destination experience for migrants drastically decreased, though returns to schooling remained constant (Yamauchi 2002), while other evidence shows that the impact of the crisis on the Bangkok labor force is relatively small (Behrman and Tinakorn 2000). The question of whether migrants' networks worked to help those vulnerable during the crisis is an interesting question but is beyond the scope of this paper.

References

Banerjee, B. 1983. Social networks in the migration process: Empirical evidence on chain migration in India. *Journal of Developing Areas* 17 (January): 185-196.

Behrman, J. R., and P. Tinakorn. 2000. The surprisingly limited impact of the Thai crisis on labor including many allegedly more vulnerable workers. Thailand Development Research Institute, Bangkok. Photocopy.

Borjas, G. 1995. Ethnicity, neighborhood and human-capital externalities. *American Economic Review* 85 (3): 365-390.

Caces, F., F. Arnold, J. Fawcett, and R. Gardner. 1985. Shadow household and competing auspices: Migration behavior in the Philippines. *Journal of Development Economics* 17 (1-2).

Carrington, J., E. Detragiache, and T. Vishwanath. 1996. Migration with endogenous moving costs. *American Economic Review* 86 (4): 909-930.

Case, A. 1992. Neighborhood influence and technological change. *Regional Science and Urban Economics* 22: 491-508.

Case, A., and L. Katz. 1991. *The company you keep: The effect of family and neighborhood on disadvantaged youth*. NBER Working Paper No. 3705. Cambridge, Mass., U.S.A.: National Bureau of Economic Research.

Foster, A. D., and M. R. Rosenzweig. 1995. Learning by doing and learning from others: Human capital and technical change in Agriculture. *Journal of Political Economy* 103 (6): 1176-1209.

Gaspar, J., and E. Glaeser. 1996. Information technology and the future of cities. *Journal of Urban Economics* 43 (1): 136-156.

Glaeser, E. 1999. Learning in cities. *Journal of Urban Economics* 46 (September): 25-77.

Glaeser, E., H. Kallal, J. Scheinkman, and A. Shleifer. 1992. Growth in cities. *Journal of Political Economy* 100 (6): 1126-1152.

Manski, C. 1993. Identification of endogenous social effects: The reflection problem. *Review of Economic Studies* 60 (3): 531-542.

Montgomery, J. D. 1991. Social networks and labor market outcomes: Toward an economic analysis. *American Economic Review* 81 (December): 1408-1418.

Munshi, K. 2003. Networks in the modern economy: Mexican migrants in the U.S. labor market. *Quarterly Journal of Economics* 118 (2): 549-597.

O'Regan, K., and J. Quigley. 1996. Teenage employment and the spatial isolation of minority and poverty households. *Journal of Human Resources* 31 (3): 692-702.

Rauch, J. 1993. Productivity gains from geographic concentration of human capital: Evidence from the cities. *Journal of Urban Economics* 34 (3): 380-400.

Schultz, T. W. 1975. The ability to deal with disequilibria. *Journal of Economic Literature* 13 (3): 827-846.

Todaro, M. 1967. A model of labor migration and urban unemployment in less developed countries. *American Economic Review* 59 (1): 138-148.

Topa, G. 2000. Social interactions, local spillovers, and unemployment. Manuscript. New York University, New York.

Yamauchi, F. 2001. Social learning, neighborhood effects and investment in human capital: Evidence from schooling investments in green-revolution India. Manuscript. Yokohama National University, Japan. Revised 2003.

_____. 2002. Is education more robust than labor-market experience in the face of crisis? Experimental evidence from Thailand. International Food Policy Research Institute, Washington, D.C. Photocopy.

_____ 2004. Are experience and schooling complementary? Evidence from migrants' assimilation in the Bangkok Labor Market. *Journal of Development Economics*. Forthcoming.

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