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Abstract

Theoretical and empirical research points to potentially different patterns of labor recruitment and importance of social networks in the formal and informal sector. The paper touches upon this topic and investigates the conjecture that employment chances and expected earnings depend differently on individuals' allocation of time and mobility patterns in the informal and formal sector. This is investigated in a LDC context using a household survey from Guatemala (Encovi 2000). The results suggest that the probability to obtain employment in agriculture (informal sector) increases with the amount of time spent at the current residence. The results are reversed for (informal) uncovered wage workers. For the (informal) self-employed and the formal sector (covered wage workers) the results does not display any evident patterns. Merging all segments of the informal sector, the results show that expected earnings in the informal sector are slightly reduced by time not spent at the current residence.

Keywords: The Informal Sector; Labor; Migration; Time; Central America; Guatemala.
JEL Classification: D13; J60; J70; 017; R23

1 Introduction

Harts' (1970) suggestion that self-employed individuals could serve to mirror the unregulated and unprotected part of the labor market gave rise to a substantial amount of research on relevant determinants of participation and earnings in the informal vs. the formal sector (see e.g. Gërxani, 2004). Since Harts' seminal contribution, empirical applications and additional operational definitions of the informal sector have generated a substantial research program.

In terms of quantity, the informal sector is a world-wide growing phenomenon, particularly in developing and transition countries (see e.g. ILO, 2002). In Africa, for instance, informal employment accounted for 90 percent of all the newly generated jobs in the 1990s. Further, informal sector activities in Latin America increased from 52 percent of total employment in 1990 to 57 percent in 1997 (see e.g. ILO, 2002). Suggested reasons for these developments are increasing global competition and rural-urban migration. Multinational firms cut their costs by outsourcing actives to specialized units, which often remain informal. In line with the predictions of the Harris-Todaro model (1970), rural-urban migrants often do no succeed in finding regular jobs in the cities and temporarily work in the unregulated informal sector.

Social networks/capital[1] have long been recognized as playing an important role in human relations and are often used to characterize the informal sector.[2] Social networks/capital are assumed to act as a major determinant of performance in the informal sector, implicitly suggesting that they are not equally important or display different operational modes in the formal sector. Surprisingly, explicit attempts to explore network effects often neglect direct comparisons between the formal and informal sector. The paper by Mitra (2004) is a recent exception. Mitra uses a micro survey of 800 households in the Delhi slum and divides the labor market into ten categories based on the type of profession. He finds that social networks typically contribute to increasing the chances of employment, but also that the type of network matters. For instance, in order to maximize the chances of employment in sales, personal service, manufacturing and commercial service jobs, it is preferable to extend one's relations beyond the

[1] Although social capital and and social networks do not have the exact same meaning their interpretation overlap. In general, social capital has a somewhat broader meaning and includes 1) Trust 2) Social norms and 3) Social Networks (see e.g., Bjornskov, 2006)

[2] For a literature review, see e.g. Gërxhani (2004)

family. Qualified jobs that require some level of education and presumably have more formal characteristics do not appear to require similar network access. This could be taken as evidence that social networks are slightly more important in at least some segments of the informal sector.

Related to social networks/capital is the relationship between labor market performance and 1) the spatial allocation of time and 2) Migration. First, time spent at a certain location may be used to build social networks and to cultivate knowledge specific to the local market. Empirical evidence on the role of time is ambiguous. Cohen and House (1996) use an employment survey from Khartoum, the capital of Sudan, and divide the informal sector into three segments. They find that the number of years spent in Khartoum increases the probability of being self-employed as compared to employment in the public formal sector, but decreases the likelihood of employment in informal small-scale and unprotected firms. Banerjee (1983) finds that the number of years an individual has spent in an urban residence has a positive impact on labor mobility between the informal and formal sectors in Delhi. This confirms the hypothesis that rural-urban migrants, who initially fail to find a regular job in the destination area, will be temporarily employed in the unregulated informal sector (Harris and Todaro (1970). This process is facilitated by rather small barriers to entering and exiting the informal sector (see e.g. Gërxhani 2003). Second, migrants may not have had the same opportunities as natives to build social networks/capital. The labor market performance of migrants compared to natives in developing countries has attracted broad academic interest, but without producing decisive answers on the question of how migrants perform compared to natives. Some studies suggest that migrants perform better than natives. Vijverberg and Zeager (1994) find that rural-urban migrants initially earn lower wages than native workers in Tanzania, but that they catch up and go beyond natives within ten years or less. The authors suggest that this may be because migrants typically are more motivated and work harder than natives. Cohen and House (1996) conclude that among (informal) unprotected workers, non-native workers have higher earnings. They also find that natives earn more in the formal sector. Other studies support a negative relationship: Telles (1993) uses Brazilian data and concludes that rural migrants are less likely than natives to find formal sector jobs in urban areas. Finally, there are inconclusive studies. The findings of Gindling T.H. (1991), for instance, do not indicate that there are earning differences between temporary (migrants) and permanent workers (natives) in Costa Rica.

In the context of these mixed results, the objective of this paper is to contribute to the debate by adding a different perspective. Building on the observation that distinct segments of the labor market are characterized by varying entry and exit conditions, this paper aims to compare the effects of time in different segments of the labor market and to investigate whether the effects vary between migrants and natives. A particular focus lies on the dichotomous division between the informal and formal sector. To the extent that time can be used as a proxy for social networks/capital and that these have different importance across different sectors of the labor market, the results should show that time interacts differently with the chances of employment and earnings in each sector. There are other potential mechanisms that are also related to the allocation of time. If it is generally easier to find jobs in the informal sector, this would suggest that it is more important to spend time near the preferred location of employment in the formal sector. On the other hand, it is likely that the formal sector is more transparent and that vacant positions are officially announced more frequently. Also, it is important to control for potential migrant effects. If the typical migrant has higher motivation and is more productive than the average native, time should have a more positive effect for migrants. However, migrant discrimination on the labor market could result in completely reversed results.

The empirical analysis proceeds in two steps. The first step investigates how the amount of time that migrants and natives live at their current residence before obtaining a job (*YearsCurrent*), affects their chances of employment in the informal and the formal sector. The second step compares how earnings are affected by the amount of time working in the current profession (*Experience*) in the informal and formal sectors.

The data comes from the Guatemala Encovi (*Encuesta Nacional Sobre de Condiciones de Vida*) Survey conducted in 2000. Guatemala is a highly unequal lower middle income country with an informal sector that employs among the largest share of the total national labor force in the world.[3] The World Bank poverty ranking of developing countries puts Guatemala in the middle

[3] Middle Income Countries are defined as countries whose GNI per capita ranges between 906 and 3595 $ (World Bank ,http://go.worldbank.org/K2CKM78CC0) In 2006, Guatemala's GNI per capita was 2640 dollars. According to the World Bank gin coefficient ranking, Guatemala was in 13th place out of 100 developing and transitional countries in 2007. ILO(2002) ranked informal sector employment out of total employment in Guatemala at between 50 and 69.9 percent. The Gini Coefficient in 2007 was 55.4. (Covalent, World Bank, as of July 18th 2007)

range.[4] Referring to these characteristics, Guatemala may best represent countries such as Honduras, El Salvador, Ecuador, Bolivia, Paraguay and Cameroon. The Encovi 2000 is a household survey and covers education, languages spoken, health, labor, fertility and migration of 7940 households. In total, it covers 37771 individuals. It is statistically representative at the national level and is officially available from the World Bank LSMS website.

The remainder of the paper is organized as follows: Section two outlines how the labor market is categorized in this paper, and in particular how the informal sector is distinguished from the formal sector. Section three discusses why time may be of importance, which also motivates the objective of this paper. Section four presents the empirical model used for the analysis. Section five reports the results and section six concludes the paper.

2 How to Define the Informal Sector

Hart's (1970) suggestion to use self-employment as a criterion to define the informal sector initiated an extensive amount of empirical research. During the 50s and 60s, the informal sector was a concern primarily for anthropologists and sociologists, but the operational definition by Hart allowed economists to enter the debate. The International Labor Organization (ILO) soon suggested broader definitions to more extensively capture the unregulated and unprotected part of the labor force working outside, but not necessarily against, the law (ILO, 1972). Some commonly used criterions involve: 1**.** Professional Status (self-employed vs. wage earner). 2**.** Work conditions (e.g. lack of social coverage) 3**.** Firm size (large vs. small firms) 4**.** Regulated or registered activities.[5] The suggestion by ILO and the Economic Commission for Latin America to define the informal sector in Latin America "*As the sum of non-professional self-employed, domestic workers, unpaid workers, and workers in enterprises employing few or five workers*" effectively summarizes the literature.[6]

Self-employment is perhaps the most commonly applied definition of informality (see e.g. Gërxhani 2003), which apparently excludes informal wage workers. This is not in line with the

[4] On the head count ratio ranking (i.e. share of population living on less than dollar a day), Guatemala was in 44th place out of 100 developing and transitional countries in 2007.(PovCalNet, World Bank, as of July 18th 2007).
[5], Gërxhani (2003)
[6] Quote from Fields (2005). pp. 5

structuralist school, which proposes that the informal sector partly has emerged as a response to many firms' attempt to minimize their costs (see e.g. ILO, 2002 and Chen, 2005). One strategy for achieving this is to outsource specific activities to the informal sector.

The definitions in this paper rest on previous work and use self-employment as a criterion for informality in the non-agricultural sector. However, it also incorporates wage workers without social protection into the informal sector. Workers without social protection constitute a larger fraction of the labor force than self-employed and small-firm workers. As can be seen in table 2.1, uncovered workers substantially overlap with small firm workers and the self-employed. 96.5 percent of small firm workers do not have social coverage and the corresponding share for the self-employed is 99.8 percent.

Table 3.1 Informality overlap for individuals
18-65 years

Coverage	Small Firms	Self-employed
Uncovered	(96.5) 6265	(99.8) 4049
Covered	(3.5) 225	(0.2) 7
∑	(100) 6490	(100) 4056

Source: World Bank (2000) and author's calculations.
Note: Self-employed exclude self-employed professionals and self-employed in the public sector.
Percentage of the total workforce is in parentheses.

Empirical research often focuses on the separation between the formal and informal sector in urban areas and overlooks the agricultural sector. As pointed out by Chen (2005): *"Many countries exclude agriculture from their measurement of the informal sector, and some measure only the urban informal sector"*

The Guatemalan Encovi Survey of 2000 has individual data from all parts of Guatemala and this paper will therefore include agriculture. This raises the question of whether agriculture should be divided into formal and informal sectors. In Guatemala, the majority of the poor resides in rural areas and work in the agricultural sector. The majority of workers within the Guatemalan agricultural sector are either subsistence farmers or agricultural day laborers in the coffee sector, whose work conditions mainly coincide with representative characteristics of the informal sector. It is therefore appropriate to think of the agricultural sector as one segment that belongs to the

informal economy but which needs to be conceptually separated from other segments of the economy. Furthermore, only about 11.1 percent of the workers within agriculture in the sample had social coverage and the corresponding share for non-agricultural workers was 25.4 percent. To treat the agricultural sector as a distinct segment also follows the theoretical set-up by e.g. Lewis (1954) and Harris-Todaro (1970), who perceived rural (traditional) areas as a supplier of labor for the urban (modern) sector in developing countries. Table 3.2. divides individuals into five categories applied in this study. Only persons between 18 and 65 years of age are considered.

Table 3.2 Informality/Formality Criterions

Work Category	Formal/Informal
1. Unpaid Workers	Neither
2. Agricultural workers	Informal
3. Self-employed workers	Informal
4. Wage workers without social coverage	Informal
5. Wage workers with social coverage	Formal

The category of unpaid workers deserves a special explanation. These workers are normally considered as informal but distinguished from paid informal workers. Unpaid workers often perform rather different tasks to paid workers. In Guatemala, the category mainly covers housekeeping and other family activities e.g. helping out at the farm. Williams and Round (2007) have treated unpaid work as a separate work category using Ukrainian data. For the objective of this paper, however, the unpaid workers are irrelevant and therefore serve as the reference category.

3 Why Time Matters

A characteristic often used to describe the informal sector is the important role played by social networks/capital. “Knowing someone who knows someone” is often referred to as an important condition for entrance (Gërxhani, 2003). This raises the question of whether social capital is more important than in the formal sector. To some extent, the terms social capital and social networks are used interchangeably in the academic literature, although economists tend to use the former more often, whereas sociologists and network specialists tend to prefer the latter. The term social capital is imprecise and has at least three separate meanings: trust among people, social norms and access to social networks (see e.g. Bjornskov, 2006),

Is the stock of social capital that individuals possess in a certain area related to how long they have lived there? Arguably, spending time at a certain location enables interaction with other people, helps adapt to local norms and to build a decent reputation in order to become trustworthy. Fafchamp and Minten (2002) show that better connections with other traders and potential lenders help to improve sales, exchange price information and reduce transaction costs for agricultural traders in Madagascar.

It is problematic, however, that time also relates to factors that are likely to affect the chances of employment and earnings. For example, a defining characteristic of migrants is that they have spent a smaller share of their lives at their current residence than natives. Migrant discrimination may negatively affect their chances of employment and earnings. The opposite is also possible if migrants represent a highly productive segment of the population. The empirical analysis controls for the migrant effect. To be more exact, the empirical analysis investigates whether time has different effects for migrants and natives, which is one of the objectives of this paper. Arguably, any knowledge about conditions specific to the local market is likely to increase the more time is spent living and working in a certain area/profession (see e.g. Cohen and House, 1996).

Nonetheless, there are several valid arguments which suggest that time may be of different importance across different segments of the labor market. For example, most agreements in the informal sector are made orally rather than in writing. An informal sector characteristic suggested by the ILO is that "*The employer-employee relationship is often unwritten and informal*".[7] It may be the case that the informal sector is less transparent than the formal sector. Vacancies in the informal sector are presumably not officially announced as frequently as in the formal sector. It is also generally believed that formal education has its strongest influence in the formal sector whereas in the informal sector, *"the street is the school"*.[8] De Soto's (1989) example of street vendors in Peru who often start their "careers" by searching for customers on the streets illustrates this point. As they do so, they gain knowledge about what goods are wanted, in which parts of the city competition is fierce, and learn from other more experienced vendors. In the

[7] Quote from ILO webpage, www.ilo.org, August 29, 2008
[8] Quotation from De Soto, 1989 pp. 63

formal sector, however, formal competence e.g. the level of education and experiences acquired from other jobs/locations are supposed to be more vital prerequisites for success. Hence, it may be the case that the informal sector rewards high productivity less than the formal sector, i.e. informal sector workers: *"Are placed at a competitive disadvantage because they do not have the type of influence which those in the formal economy are often able to exert-influence which sometimes violates an essential feature of a market economy i.e. free and equal access to markets based on efficiency rather than influence."*[9]

Levi (1988) states that tax-evasion is more likely when taxpayers do not trust the official authorities. Hence, the informal sector is, ceteris paribus, likely to be larger in countries where the aggregated level of trust between individuals is low. Lassen (2007) presents macroeconomic evidence that the informal sector is indeed larger in more ethnically fractionalized countries where, he argues, the general level of trust should be lower. If, then, trust is lower in the informal sector it means that winning other people's confidence should constitute a larger impediment to entry into the labor market than in the formal sector. In economic environments where there is no legal framework (e.g. in the informal sector) to enforce contract certainty, Landa (1981) proposed a formal framework for how traders in the informal sector form "ethnically homogenous club-like institutions" to reduce transaction costs. She provided the following examples: the Chinese in South-East Asia, Indians in Central and East Africa, the Lebanese in West Africa and Jews in Europe. The cost of joining these clubs is zero if one belongs to the right kinship or ethnic group, but "outsiders" must confer to other strategies such as building a decent reputation in order to obtain access to these job markets. A recent cross-country study by Ahlerup, Olsson and Yanagizawa (2008) finds that intrapersonal trust has a more positive effect on economic growth in countries where institutions are weak. The authors argue that this result is in line with many of the results from micro studies suggesting that "*social trust and formal institutions should be primarily substitutes in the growth process at the macro level*".[10]

Granovetter (1983) has suggested that inter-individual relationships without personal commitment (weak ties) are more important than relations with personal commitment (strong ties

[9] Quote from ILO (2002). pp. 3
[10] Quote from Ahlerup, Olsson and Yanagizawa., 2008, pp. 4, www.hgu.gu.se/item.aspx?id=2465

with relatives) on the labor market. Weak ties are thought to connect different social groups to each other and thereby constitute a decisive factor that provides individuals with information about labor market opportunities. Given that the informal sector is organized through "ethnical club-like institutions" to a greater extent than the formal sector, and that trust is lower in the informal sector, the barriers to and costs of building weak ties should then be highest within the informal sector.

The overall impression from the literature is that to win confidence from other people, to obtain trust and simply to learn how the local markets work may be more important components in the job-searching and job-creating process where informality has its strongest influence i.e. in the informal sector. To the extent that time can proxy such prerequisites, this would suggest that the amount of time individuals have been living and working and their current residence/profession should more positively affect their chances of employment and earnings in the informal rather than the formal sector.

On the other hand, researchers often refer to the informal sector as an "ease of entry" sector which rather contradicts this proposal. The adopted division of the labor market outlined in section two may further be too rough to capture essential mechanisms that can vary across different job categories within the informal and the formal sector. For instance, social networks have been shown to have a higher influence on the chance of obtaining qualified professions compared to those with lower requirements (Granovetter, 1995). Since the formal sector employs most of the qualified workers this may yield reversed results. Yet, since vacancies are likely to be appointed by stricter means in the formal compared to the informal sector, this may imply that physical presence indeed raises the chances of employment more in the informal than in the formal sector.

It is problematic to think of the informal sector as one entity. The agricultural sector may stand out on its own. Financial constraints may reduce the overall mobility of employees in agriculture relative to other sectors. For the empirical analysis, this could mean that the probability of employment in agriculture is negatively related to the amount of time that individuals spend at the current residence. Likewise, time may play a different role for the self-employed and

uncovered wage workers. Self-employed are, by definition, working for themselves whereas wage workers are employed. Overall, the discussion in this section suggests that the allocation of time may play a different role in the different segments of the labor market. The focus in this paper is on the dichotomous division between the informal and the formal sector, but the discussed mechanisms may also suggest that the effects vary across all sectors of the labor market.

4 Methodology

4.1 The Model

Previous empirical work that distinguishes between the informal and formal sector is usually categorized into at least two strands: First, the "dualistic" view that regards the informal sector as a residual sector where workers end up when they have failed to become formal (Harris and Todaro 1970; Fields 1975; Mazumdar 1976). Second, there is the "alternate" view which suggests that working in the informal sector is potentially as attractive as formal sector employment. To work in the informal sector is considered as a rational choice as opposed to something that workers are forced to do when they have already tried everything else (e.g. Cohen and House, 1996). This view has won increasing popularity over the last years. Maloney (2004) refers to empirical evidence from Argentina, Brazil and Mexico and concludes that the dualistic view improperly describes the Latin American situation. One factor that favors self-employment over wage employment is the ability to make independent decisions. Moreover, the low ratio of well educated individuals in the informal sector may imply that the opportunity cost of not working in the formal sector increases with the level of education. Hence, for low skilled individuals, wages in the informal sector may be better. Williams and Round (2007) argue that both views may be plausible approaches to describe the informal sector, depending on the type of informality. In interviews with 600 households in Ukraine, they find that ninety percent of self-employed non tax-paying individuals chose to become informal. However, informal (i.e. non tax-paying) wage workers expressed extensive discontent with their current situation as they were denied the right to social security and pensions. Also, for the case of Bolivia, Pradhan and Van Soest (1995) find that a model that adopts the dualist view (an ordered probit model) yields the best econometric fit for men. For women, however, they obtain a better fit when they adopt the alternate view (a multinomial logit model). As can be seen in table 3.7 in the appendix, the

Guatemalan situation in the year 2000 may be supportive of the alternate rather than the dualistic view as the level of education is generally higher in the formal sector compared to the informal sector. The model in this paper therefore adopts the alternate view.

This approach has been used extensively in the literature (e.g. by Cohen and House, 1996) and relies on the assumption that rational individuals predict monetary and non-monetary rewards (leisure and consumption of various goods etc.) in different sectors of the labor market, and choose to work where their expected utilities are maximized. The individual expected utility from each sector is dependent on the specific preferences of each individual. The model does not allow individuals to work in more than one sector. Accordingly, only first-jobs are considered. As defined in section two, the labor market is divided into five segments: 1. Unpaid workers 2. Agricultural workers 3. Self-employed workers 4. Uncovered wage workers and 5. Covered wage workers. The first step of the analysis is to estimate how different characteristics affect the probability of working in each sector. A multinomial logit model does not impose any ranking between the different segments of the labor market:

$$\Pr(y_i = m \mid X_i) = \frac{\exp(X_{ijk}\beta_m)}{1 + \sum_{m=2}^{5} \exp(X_{ijk}\beta_m)} \qquad (1)$$

The probability that the *i*th individual, from the *k*th household and the *j*th region, will choose to work in sector *m* depends on individual, household and regional characteristics (X_{ijk}) and the estimated parameters (β) from all segments of the labor market. Unpaid workers (i.e. m=1) serve as the reference sector.[11] Hence, it is assumed that $\beta_1=0$ which is necessary for identification of the model. The interpretation of the βs is not straightforward. In fact, a positive estimate for a specific variable in a given segment of the labor market does not necessarily indicate that a positive change of the variable positively affects the probability of employment in that sector. In order to deliver an accurate and intuitively appealing interpretation of the results, section 5.1

[11] To also incorporate the unemployed into the analysis would require information on employment times, since *YearsCurrent* is calculated as number of years spent at current location minus number of years spent at current job (*Experience*). However, since unpaid workers mainly perform domestic work and do not usually need to find employment in the same manner as in other sectors, is should be a good reference category.

reports the predicted change in probabilities of employment due to positive changes of the explanatory variables.

Secondly, using OLS, Mincerian earning equations are estimated

$$\ln(W_{ij}) = \gamma_j Zjk_i + \lambda_{ij}\,\delta_{ij} + \varepsilon_{ij} \qquad (2)$$

where W_{ij} is the hourly wage obtained by individual i in sector j.[12] The wage regressions are estimated for all segments of the labor market simultaneously. Similar to X_{ijk}, Z_{ijk} is a vector of individual, household and regional characteristics that affect the wage of individual i. For identification of the parameters in equation 2, X_{ijk} includes variables that are not in Z_{ijk} and vice versa (Davidsson and McKinnon, 2004). γ_j and λ_i are the parameters to be estimated. ε_{ij} is the error term for individual i in sector j. One has to be aware of the potential problem of individuals not being randomly selected into the labor market. This is referred to as sample selection bias and leads to biased parameter estimates (see e.g. Verbeek, 2000). λ_{ij} is an individual and sector specific vector of "selection terms" developed by Dubin and McFadden (1984), which corrects for this. λ_{ij} is obtained by first estimating equation 1, which allows estimating the individual probabilities of working in each sector. The estimated probabilities are used to generate the λ_{ij} vector which is then included when estimating equation 2. The Dubin and McFadden approach involves less restrictive assumptions of the error terms than the more commonly used method of Lee (1983). Also, Bourguignon, Fournier and Gurgand (2004) showed by Monte-Carlo Simulations that Dubin and McFadden's variant often performs better than Lee's. Accordingly, the Dubin and McFadden approach is used here.

4.2. Variables

The explanatory variables in the multinomial and the wage regressions are divided into individual, household and regional characteristics, which are in line with the theoretical setup

[12] They include any benefits reported (e.g. tips, housing, clothes etc.) Note: Gross earnings are not separated from net earnings as the survey did not contain any information on tax-payment. First, yearly income is calculated as all reported incomes from first-jobs the last 12 months. Hourly earnings are calculated as the total yearly income divided by the reported number of working hours devoted to first jobs the last 12 months

commonly applied in the field (e.g. by Tansel 1999 and Vijverberg and Zeager 1994). They are summarized in table 3.3.

The main variable of interest in the multinomial regressions is the number of years that individuals have spent at their current residence before obtaining their current job (*YearsCurrent*). The main explanatory variable in the wage regressions is the number of years that individuals have been employed in their current job (*Experience*). *YearsCurrent* is only included in equation 1. whereas *Experience* is only in equation 2., which ensures that the parameters in equation 2 are identified (see section 4.1). To allow for a diminishing effect as *YearsCurrent* and *Experience* are increasing, they are transformed by taking the square root (√*YearsCurrent,* √*Experience*). These variables may function as a proxy for access to social networks/capital and knowledge about the local labor market. The main question in this paper is whether √*YearsCurrent* and √*Experience* affect the probability of employment and earnings across different segments of the labor market differently, particularly in the informal and formal sectors. Further, this paper ascertains whether the effects are different for migrants and natives. Since age is controlled for, a positive effect of √*YearsCurrent* suggests that it is preferable to reside near the preferred location of employment as compared to elsewhere.

Four variables are added to control for some of the potential mechanisms through which √*YearsCurrent* and √*Experience* may affect the chances of employment and earnings. If the effect on employment and earnings appears partially via these variables, √*YearsCurrent* and √*Experience* should be found to have a lower effect when including them in the regressions compared to when they are excluded.

The first variable controls for the importance of how individuals acquire information about the region where they live *(Conversation)*. It is a dichotomous variable indicating that individuals´ primary source of information is from talking to other people. The benchmark is individuals who essentially inform themselves through other channels (e.g. television, newspapers) or not at all. It may have higher effects in sectors where agreements are made on a more informal basis.

Table 3.3 Description of main variables used in the empirical analysis

Variable	***Description***
√YearsCurrent	Square root of no of years spent at current residence before obtaining current job. Was calculated by subtracting the number of years that people have lived at their current residence (municipality) minus the number of years employed in their current job.[13]
√YearsCurrent*Migrant	√YearsCurrent times an indicator for migrant status (1=individual has lived elsewhere than current location (municipality))
√Experience	Square root of number of years employed in current job.
√Experience*Migrant	√Experience times an indicator for migrant status (1=individual has lived elsewhere than current location (municipality))
Conversation (d)	Indicates that the individual's primary source of information about the near region is through conversation with other people, zero for those who inform themselves mainly through other means or not at all. (d)
Assistance - Family (d)	Household members would turn to family in case of death/accident/disease.
Assistance - Friends and Neighbours (d)	Household members would turn to neigbours and friends in case of death/accident/disease.
Assistance - Religous Grops, etc. (d)	Household members would turn to a religios group, a community leader or any organization they belong to in case of death/accident/disease.
Spanish (d)	Speaks Spanish (d)
Primary School (d)	Finished primary school, (d)
Secondary School (d)	Finished secondary school (d)
University (d)	Finished university (d)
Married	Married or living with someone (d)
Male (d)	Indicator for males.
Indigenous (d)	Belongs to any indigenous group (d)
NonMetropolitan (s)	Lives outside Guatemala City (d)
Urban (d)	Residence in urban vs. rural areas, 1 if urban (d)
Household Size	No of members in the household
Age1824 (d)	18 to 24 years of age (d)
Age2534 (d)	25 to 34 years of age (d)
Age4554 (d)	45 to 54 years of age (d)
Age5565 (d)	55 to 65 years of age (d)

Note: (d) indicates dummy variable, taking value 1 if true, 0 otherwise.

The other three variables are about assistance. In the household survey, the head of the household was asked whose assistance she would seek in the event of death of the households' father/mother or in case someone in the household had a severe accident or disease. The respondents were allowed to give two replies and could choose between several options, which were used to generate three variables (*Assistance -Family, Assistance- Neighbors and Friends, and Assistance-Religious Groups etc*.) The benchmark is households who do not have anyone to

[13] Negative numbers are replaced by zero. A negative number implies that the individual found his current job while living in another location. Apparently, no time at the current residence was needed to find the current employment.

turn to/or those who claim that they would go to the local police or other impersonal institutions (e.g. NGOs, the Government etc.). The benchmark category constitutes 32.1 (2334) percent of the 7276 sample households. An obvious weakness is that these variables only vary across households but not between individuals belonging to the same household.

The migrant effect is controlled for by interacting $\sqrt{}$*YearsCurrent* and $\sqrt{}$*Experience* with a dichotomous variable for migrant status (*Migrant*). If migrant discrimination predominates over other factors, it should have a negative effect. On the contrary, if positive selection is the dominant factor, the effect should be positive.

The remaining variables control for human capital, gender, civil status, ethnicity, geographical factors, age and household size. Human capital is controlled for with indicators for ability to speak Spanish (*Spanish*) and dichotomous variables for levels of education achieved (*Primary School, Secondary School and University*). The benchmark for education is individuals with no schooling. Civil status controls for different preferences of individuals that are married, live with others or live alone (*Married*). To have responsibility for someone else may affect one's choice of occupation. Marriage may also affect men and women differently, since traditional households often assign domestic work to women whereas men are the typical wage earners. This is controlled for by interacting *Married* with an indicator for gender (*Male*). A dummy variable for indigenous origin (*Indigenous*) controls for ethnicity. Regional and neighborhood infrastructure is controlled for by dichotomous variables indicating: 1) Living in an urban area (*Urba*n) and 2) Residence outside the capital Guatemala City (*NonMetropolitan*). The number of family members (*Household size*) captures responsibility towards others. Having more members in the household may further release resources for duties other than paid work e.g. domestic services (unpaid work). Age is controlled for by including dummy variables that indicate different levels of age.[14] The reference category is individuals between 35 and 44 years of age.

[14] Including Age and Age^2 instead generated very similar results.

5 Estimation Results

5.1 Occupational Choice

Tables 3.7 and 3.8 in the appendix provide descriptive statistics of labor market participation and earnings in Guatemala. There are substantial differences with respect to age, sex, language abilities, ethnicity, education, civil status geographical location and migrant status. They are primarily as expected and typically in line with the results from the regressions and will therefore only be commented on when the estimation results are unexpected or when they do not support one another.

Table 3.4 shows a tabulation of occupational status against informal/formal status. Although there are substantial similarities of occupational status between self-employed and wage workers, there are also striking differences. For instance, about 53 percent of the self-employed are in commerce but the corresponding values for uncovered and covered wage workers are substantially smaller (24.2 and 16 percent). Further, financial services, public administration and teaching employ significantly larger shares of formal sector workers than in the informal sector.

Table 3.4 Occupational and informal/formal sector status (%)

Occupational/Informal Status	The Informal Sector			The Formal Sector
	Agriculture	Self-employed	Uncovered Wage Workers	Covered Wage Workers
Agriculture	100	0	0	0
Mines & quarries	0	0.17	0.15	0.25
Industrial workers	0	26.67	15.99	22.07
Electricians	0	0.21	0.59	1.12
Construction	0	5.00	14.16	5.15
Commerce	0	52.82	24.19	15.95
Transportation, Communication & Storage	0	3.03	6.15	3.52
Financial services	0	1.37	4.13	8.66
Public administration	0	0.21	3.18	11.11
Teaching	0	0.09	6.15	20.18
Health, social work	0	10.38	24.88	11.47
Unspecified	0	0.04	0.44	0.51
$\sum$	100	100	100	100
# Individuals	3,252	2340	2733	1962

Source: World Bank (2000) and estimates of this paper

Independence of irrelevant alternatives (IIA) is a critical assumption when estimating a multinomial logit model. IIA implies that the choices defined in the dependent variable must not be close substitutes. Then the multinomial logit model produces invalid estimates (Long, 1997). To test if IIA is violated, a Hausman-McFadden test is used, removing one work sector category at a time. Although table 3.4 supports some degree of substitutability mainly between covered and uncovered wage work, it does not violate IIA. Moreover, likelihood ratio tests do not indicate that some or all of the categories should be combined, which confirms that the employed division of the labor market is fairly reasonable.

The model converged relatively fast (after six iterations) and most coefficients are significant at the one percent level. Table 3.11 in the appendix reports the coefficient estimates and their level of significance.

Table 3.5 contains the marginal effects obtained from the multinomial regression. The effect of $\sqrt{YearsCurrent}$ is significantly negative in agriculture, but positive in the other sectors. Hence, the results suggest that the amount of time individuals spend in a certain location significantly

affects their chances of employment in the same area. The marginal effect is highest for uncovered wage workers, followed by covered wage workers and the self-employed. Statistical tests show that the effects of √*YearsCurrent* are significantly different across sectors. Wald tests reject equality of the obtained parameter estimates for √*YearsCurrent* at the ten percent level or lower in all cases except when comparing the coefficients for the self-employed with those for covered wage workers. Likelihood ratio tests yield similar results. Equality of the parameter estimates are rejected at the five percent level or lower in all cases except when comparing the coefficients between the self-employed and covered wage workers.

Due to the non-linear properties of the multinomial logit model, the marginal effects vary across individuals. Further, the marginal effects do not reveal that the effects diminish as *YearsCurrent* increases. It may be more appealing to illustrate the effects graphically with the probabilities of employment plotted against different values of *YearsCurrent*. Figures 3.1 and 3.2 therefore plot these probabilities of employment for migrants and natives, respectively. The provided example illustrates the probability of employment for a 40-year old individual. Graphs have also been generated for other age levels and the appendix provides examples for 20 and 60 year old individuals. Overall, the results are very similar. Figures 3.1 and 3.2 confirm the results presented in table 3.5.

The probability of employment in agriculture decreases as *YearsCurrent* increases but there is a reversed pattern in the other sectors. The effects subsequently diminish and the effects are stronger for migrants than natives. The negative effect of *YearsCurrent* in agriculture may be indicative of low mobility to other sectors. If a typical agricultural worker devotes all of his/her life to farming, there should be a negative correlation between the probability of employment and the amount of time used for other purposes. It may also be indicative of low unemployment rates and that vacancies are filled quickly.

√*YearsCurrent* has the highest marginal effect for uncovered wage workers, as is also confirmed in figure 3.2 where it can be seen that uncovered workers have the most rapid increase in the probability of employment. This suggests that, for natives, it is more important for informal than formal wage workers to spend time near the preferred location of employment. One explanation

for this could be a higher importance of social networks/capital and a lower degree of transparency when looking for informal wage work compared to formal wage work. A similar conclusion cannot be inferred when comparing covered wage workers with the self-employed. √*YearsCurrent* has a slightly higher marginal effect for covered wage workers than for the self-employed, but the Wald and LR tests, mentioned above, do not reject equality of the parameter estimates. A common characteristic to describe the informal sector is that it is "easy to enter" which may be more accurate for the self-employed than uncovered wage workers. This may compensate for any lack of transparency, which could explain why *YearsCurrent* appears to have a similar effect for self-employed and covered wage workers.

Similar to √*YearsCurrent, the* √*YearsCurrent*Migrant* variable is found to have a positive effect in all sectors except in agriculture, where the effect is negative. The negative effect in agriculture could be due to low unemployment. Those who migrate to work in agriculture may find paid employment immediately, which suggests that migrants who spend time doing something else have moved for other reasons. The positive effect in the other sectors could be due to positive selection, e.g. that migrants are more persistent when looking for jobs.

By contrast to the √*YearsCurrent* variable, √*YearsCurrent*Migrant* has a higher marginal effect for the self-employed and covered wage workers compared to uncovered wage workers. A visual comparison of figure 3.1 and figure 3.2 confirms this. The curve for uncovered wage workers is clearly the steepest of the three in figure 3.2 (natives), but this is not the case in figure 3.1 (migrants), which also accounts for the migrant effect, where the three curves appear to have similar slopes. The higher estimated migrant effect for self-employed and covered wage workers may be due to lower migrant discrimination in these sectors. Migrants may also look more vigorously for formal employment than natives. However, the parameter estimates of the three sectors do not differ significantly. Wald and LR tests do not reject equality for the *YearsCurrent*Migrant* variable except when comparing with agriculture, which has a significantly lower parameter estimate than all the other sectors.

The obtained parameter estimates for √*YearsCurrent* and √*YearsCurrent*Migrant* do not change considerably if the three dichotomous variables about Assistance and/or the *Conversation*

variable are excluded. The parameter estimates from a regression under exclusion of the three variables capturing assistance can be found in table 3.12 in the appendix. Whatever effect *YearsCurrent* has on employment, it does not appear to go through any of these variables. Further, *YearsCurrent* has a very low correlation with these variables.[15]

Assistance-Family is insignificant in all sectors and does not appear be an important variable for employment. *Assistance – Family and Friends* has a significantly positive effect in agriculture but is negative in the other sectors. A possible interpretation is that "weak ties" (i.e. relationships without personal commitment) is a more important factor for finding non-agricultural employment, whereas those who look for farm jobs benefit more from strong ties (relationships with personal commitment). To belong to a religious group or any organization (*Assistance-Religious Groups, etc*) does not appear to significantly affect the chances of employment in any of the sectors.

Conversation is significantly positive in agriculture and negative in the other sectors. This may indicate that jobs in the agricultural sector are found through informal contacts more frequently than in other sectors. However, endogenity is also likely since agricultural workers most certainly have less access to television and newspapers than others. This result therefore calls for cautious interpretation.

The control variables are mainly as expected. Table 3.5 shows the changed probability of employment due to positive changes of all the explanatory variables. Spanish language skills and education typically increase the probability of wage employment and education particularly promotes employment in the formal sector. The insignificance of *University* in the formal sectors may be explained by the small number of individuals in the sample with a university degree (723). The signs of *Male*, *Married* and *Married*Male* suggest that men are the typical family supporters. Among unmarried individuals, women have a higher probability than men of non-agricultural employment. This is a bit unexpected as it contradicts the fact that 9.9 percent of the unmarried men are employed in the uncovered non-agricultural sector, which exceeds the corresponding share for unmarried women (8.7 %). *Household size* is negatively associated with

[15] A table of pairwise correlations between the independent variables is in the appendix.

Table 3.5 The Effects on the probabiliy of employment

		The Informal Sector			The Formal Sector
Variables	Change	Agriculture	Self-Employed	Uncovered Wage Workers	Covered Wage Workers
√YearsCurrent	M.e.	-0.037***	0.011***	0.016***	0.012***
		(-10.73)	(5.62)	(8.38)	(5.49)
√YearsCurrent*Migrant	M.e.	-0.046***	0.018***	0.012***	0.017***
		(-8.43)	(6.71)	(5.45)	(6.12)
Assistance - Family	0→1	-0.005	0.003	-0.008	0.010
		(-0.38)	(0.41)	(-1.35)	(1.49)
Assistance - Friends and Neighbours	0→1	0.076***	-0.029***	-0.021***	-0.030***
		(5.62)	(-3.88)	(-3.31)	(-3.95)
Assistance - Religious Groups, etc	0→1	0.012	-0.009	-0.015*	0.007
		(0.54)	(-0.81)	(-1.65)	(0.55)
Conversation	0→1	0.102***	-0.034***	-0.036***	-0.030***
		(7.38)	(-4.21)	(-5.22)	(-3.76)
Male	0→1	0.410***	-0.313***	-0.061***	-0.038**
		(20.41)	(-10.21)	(-3.95)	(-2.33)
Spanish	0→1	-0.100***	-0.010	0.029**	0.085***
		(-4.39)	(-0.69)	(2.51)	(5.87)
Indigenous	0→1	0.109***	-0.024***	-0.029***	-0.061***
		(8.00)	(-3.22)	(-4.75)	(-7.91)
Married	0→1	-0.043	0.076***	-0.033**	-0.012
		(-1.32)	(8.90)	(-2.08)	(-0.78)
Married*Male	0→1	0.148***	-0.051**	0.023*	0.044***
		(3.92)	(-2.29)	(1.93)	(3.63)
Household Size	M.e.	0.001	-0.003**	0.002*	-0.002
		(0.35)	(-2.09)	(1.77)	(-1.38)
NonMetropolitan	0→1	0.496***	-0.078***	-0.176***	-0.252***
		(25.60)	(-4.94)	(-10.67)	(-12.63)
NonMetropolitan*Urban	0→1	-0.332***	0.105***	0.119***	0.116***
		(-24.28)	(9.12)	(11.14)	(9.41)
Primary School	0→1	-0.157***	0.048***	0.029***	0.074***
		(-11.46)	(6.49)	(4.37)	(8.56)
Secondary School	0→1	-0.379***	-0.040***	0.052***	0.369***
		(-14.50)	(-3.47)	(3.84)	(15.66)
University	0→1	0.080	-0.055**	-0.015	-0.002
		(1.20)	(-2.38)	(-0.64)	(-0.06)
Age <25	0→1	-0.143***	-0.057***	0.123***	0.029**
		(-6.57)	(-5.73)	(9.43)	(2.44)
Age 25-34	0→1	-0.081***	-0.022**	0.063***	0.025**
		(-4.28)	(-2.35)	(6.26)	(2.51)
Age 45-54	0→1	0.033*	0.005	-0.024***	-0.017
		(1.65)	(0.49)	(-2.61)	(-1.57)
Age >55	0→1	0.115***	0.006	-0.043***	-0.082***
		(5.13)	(0.48)	(-4.18)	(-7.42)
		log-likeliohood	-13724.4		
		Pseudo R^2	0.231		
		Observations	11423		

Source: World Bank (2000) and author's calculations. *, **, and *** denote significance at the ten, five and one percent level, respectively. Azymptotic z-values are in brackets. M.e. denotes marginal effect.While calculating the marginal effects, values of other variables must be fixed. The means or the most frequenly occuring values are used: √Time=3.76, √Time*Migrant=0.68, Assistance - Family=1, Assistance - Friends and Neighbours=0, Assistance -Religios Groups etc=0, Conversation = 1, Male=1, Spanish=1, Indigenous=0, Married=1, Married*Male=1, NonMetropolitan=1, NonMetropolitan*Urban=0, Primary School=1, Secondary School=0 University=0, Age <25=0, Age 25-34=0, Age 45-54=0, Age >55=0

Figure 3.1 Time spent on location and the probability of employment (%) for migrants (Age 40)

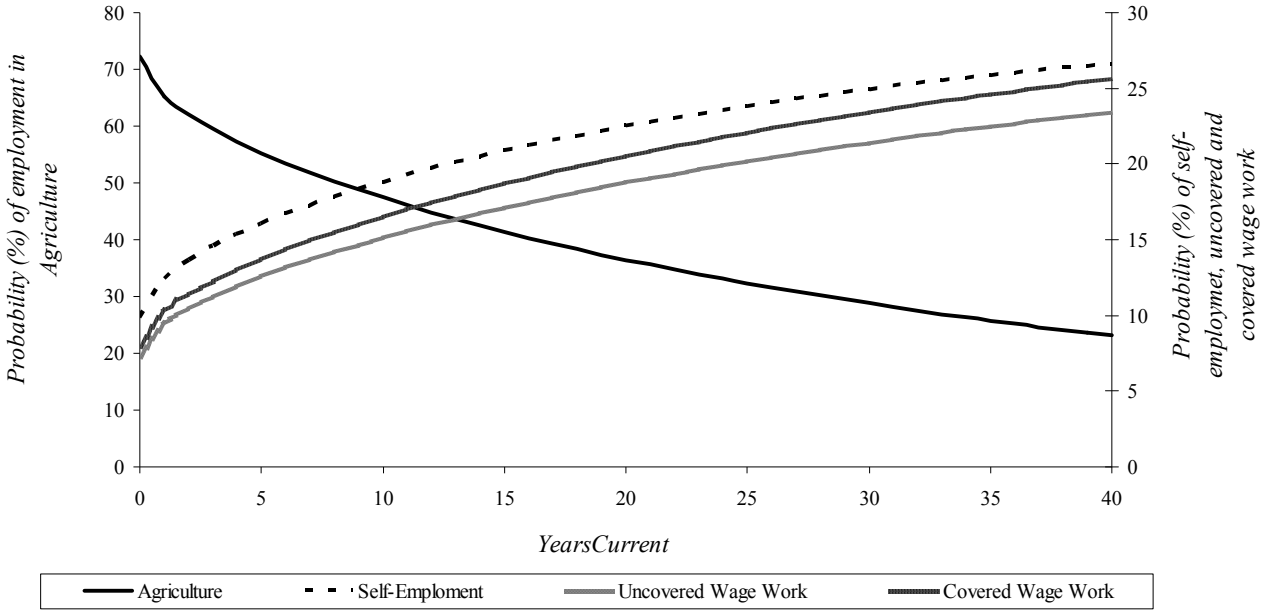
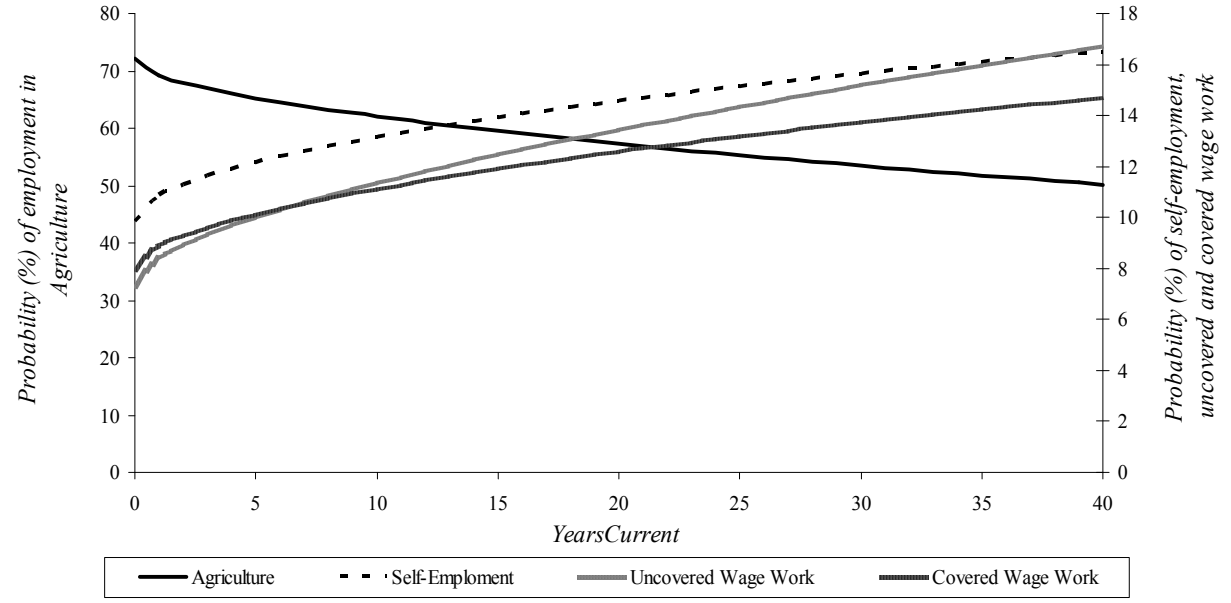


Figure 3.2 Time spent on location and the probability of employment (%) for natives (Age 40)



self-employment and employment in the agricultural sector. This suggests that an increase of the supply of labor in the household releases resources for non-market activities. As expected, Indians have a higher probability of finding work in agriculture but are less likely to find wage work. Nonmetropolitans and rural residents are more likely to perform agricultural work but have a lower probability of working in the non-agricultural sector.

5.2. Earnings

Table 3.6 contains the estimation results of the wage regressions. To test the hypothesis that all the selection terms (λ_1- λ_4) are zero, F-tests have been performed and rejected at the five percent level or lower for the self-employed and wage-worker sectors, indicating the presence of sample selection bias in these sectors. The highest adjusted R^2 and best econometric fit is obtained within the formal sector, followed by uncovered wage workers. To account for the two-step procedure of a selection model, the asymptotic Z-values have been bootstrapped 1000 times.[16]

√*Experience* is negative and significant in agriculture whereas it has a significantly positive effect for covered wage workers. It is insignificant in the other sectors. The negative effect in agriculture is hard to interpret but could reflect the fact that people who stay in agriculture are less productive than those who leave to find other jobs. The results do not considerably change when controlling for *Assistance* and *Conversation*. Hence, the positive effect from √*Experience* for uncovered wage workers does not appear to go through any of these channels. The insignificant effect for uncovered wage workers and self-employed may indicate that they have little chance to affect their earnings. *Experience* may be a proxy of productivity, but is not necessarily related to social capital which may be supportive of an earlier statement in this paper, namely that informal sector workers: *"Are placed at a competitive disadvantage because they do not have the type of influence which those in the formal economy are often able to exert-influence which sometimes violates an essential feature of a market economy i.e. free and equal access to markets based on efficiency rather than influence."*[17]

The migrant effect (√*Experience*Migrant)* is insignificant in all sectors except for uncovered wage workers where the effect is significantly positive. Since migrants live farther away from

[16] For a description of bootstrapping, see e.g. Davidson and McKinnon, (2004).
[17] Quote from ILO (2002). pp. 3

Table 3.6 Wage Regressions: OLS Estimates

Dependent Variable: Natural logarithm of hourly earnings

Independent Variables	The Informal Sector			The Formal Sector
	Agriculture	Self-Employed	Uncovered Wage Workers	Covered Wage Workers
√ Experience	-0.177***	-0.025	0.012	0.103***
	(-10.98)	(-1.12)	(0.97)	(7.81)
√ Experience * Migrant	0.001	-0.019	0.055***	0.002
	(0.09)	(-0.89)	(3.95)	(0.12)
Assistance - Family	-0.046	0.065	0.094***	0.004
	(-1.07)	(1.01)	(3.91)	(0.14)
Assistance - Neighbours and friends	0.021	-0.072	-0.066*	0.026
	(0.45)	(-0.91)	(-1.74)	(0.74)
Assistance - Religios Group, etc.	-0.120*	0.012	0.071	-0.010
	(-1.83)	(0.11)	(1.18)	(-0.19)
Conversation	-0.145***	-0.086	-0.052	0.014
	(-2.89)	(-1.3)	(-1.59)	(0.49)
Household Size	0.028***	0.049***	-0.005	-0.004
	(3.25)	(3.13)	(-0.77)	(-0.62)
Male	0.05	0.336*	0.226***	0.085
	(0.25)	(1.84)	(3.34)	(1.06)
Spanish	0.205***	0.337**	0.596***	-0.089
	(2.86)	(2.51)	(6.78)	(-0.41)
Indigenous	-0.197***	-0.268***	-0.263***	-0.001
	(-3.51)	(-2.73)	(-5.69)	(-0.02)
NonMetropolitan	-0.053	-0.667***	-0.81***	-0.073
	(-0.21)	(-3.79)	(-8.59)	(-0.99)
NonMetropolitan*Urban	0.144	0.387***	0.246***	0.065
	(1.29)	(3.19)	-3.86	(1.06)
Primary School	0.049	0.184*	0.315***	-0.242***
	(0.87)	(1.82)	(6.24)	(-2.72)
Secondary School	0.793***	0.397	1.212***	0.460***
	(2.81)	(1.34)	(9.99)	(3.63)
University	0.560*	0.574**	0.570***	0.374***
	(1.7)	(2.34)	(7.70)	(8.15)
Age < 25	-0.180	0.187	-0.028	-0.172**
	(-1.52)	(0.85)	(-0.33)	(-2.24)
Age 25-34	-0.135*	0.171	0.038	-0.121***
	(-1.81)	(1.56)	(0.71)	(-2.63)
Age 45-54	0.068	0.06	-0.008)	-0.067
	(1.05)	(0.67)	(-0.14)	(-1.53)
Age > 55	0.059	-0.089	-0.318***	0.026
	(0.67)	(-0.69)	(-3.83)	(0.122)
λ_1	-0.328*	0.559	0.269*	-0.322
	(-1.71)	(1.60)	(1.86)	(-1.54)
λ_2	0.275	-0.979***	-0.890***	-0.064
	(0.68)	(-3.27)	(-6.25)	(-0.45)
λ_3	0.444	1.072*	-0.343	-0.252
	(0.85)	(1.93)	(-1.60)	(-1.19)
λ_4	-0.436	-0.596	1.051***	0.900***
	(-0.77)	(-0.86)	(3.87)	(2.91)
Constant	1.222**	0.768***	1.064***	2.830***
	(2.34)	(2.78)	(5.38)	(4.76)
No of observations	2898	2270	2557	1909
Adjusted R^2	0.126	0.13	0.357	0.421

Source: World Bank (2000) & author's calculations. Bootstrapped Z-values are in brackets.
*, **, *** denote significance at ten, five and one percent level, respectively. λ1 – λ4 are the Dubin-McFadden terms to correct for potential sample selection bias. White's test does not support presence of heteroskedasticity and white's correction does not considerably change the results. Hence, the reported z-values are based on OLS standard errors.

their birth place than natives and arguably have inferior economic backup from household members, they may be more inclined to work hard, particularly when working conditions are poor. Economic literature has often perceived migration as an attempt to increase income.[18] When households send migrants to raise their family income, they are likely to send the most productive individuals. However, the migrant effect is insignificant in the other sectors.

The *Assistance* variables have somewhat ambiguous effects. *Assistance – Family* is significantly positive for uncovered wage workers. Since the benchmark category involves both households that do not have anyone to turn to for help and those who turn to public institutions e.g. the police, this may indicate that those who have a family to support work harder. *Assistance – Neighbours and Friends* is negative for uncovered wage workers. This does not have a clear-cut interpretation but it is only borderline significant (i.e. at the ten percent level) and should be interpreted with care. This is also the case for *Assistance – Religious Groups, etc,* which is significantly negative at the ten percent level in agriculture. *Conversation,* however, has a positive effect in agriculture and with a considerably strong level of significance (1 percent level). This could indicate that people who acquire information through more "sophisticated" channels than from talking to people are also more productive. It could just as well, however, be due to endogeneity since those individuals with access to televisions and/or newspapers arguably have the highest earnings.

Education appears to have a positive effect in general. However, *Primary School* is significantly negative for covered wage workers (the formal sector) but this is probably due to its' relatively high educational level. Only 8.8 percent of all the covered wage workers have no schooling at all.

Self-employed and uncovered wage workers with Spanish language skills have significantly higher earnings. The insignificance of *Spanish* in the formal sector is probably explained by its few non-Spanish speakers (12). Average earnings for Spanish speakers are higher than for non Spanish speakers in all sectors (see table 3.8 in the appendix). Individuals between 35 and 44 are at the peak of their lifecycle earning curve as all the significant coefficient estimates for other age

[18] This is the neo-classical standpoint as suggested by Harris-Todaro (1970).

cohorts are negative. *Male*, *NonMetropolitan, NonMetropolitan*Urban* and *Indigenous* have, when significant, their expected signs.

6 Conclusions

The aim of this paper is to highlight the fact that the formal and informal sectors may function rather differently, which potentially affects how individuals choose where to allocate their time in order to maximize their earnings and chances for employment. The informal sector is divided into three segments: agriculture, self-employment and uncovered wage workers. Covered wage workers define the formal sector. The paper tests whether time affects participation and earnings in different segments of the labor market differently and whether the effects are different for migrants and natives. This is explored in two steps. First, by investigating what effect the amount of time that individuals reside at their current residence before they obtain their current job (*YearsCurrent*) has on their chances of employment. Second, by investigating how the number of years of employment (*Experience*) affects earnings in each sector. The analysis tests whether there is a significant difference between migrants and natives by also interacting the time variables with a dichotomous variable indicating migrant status (√*YearsCurrent*Migrant and* √*Experience*Migrant*)

A general conclusion is that it is hard to talk about the informal sector as one homogenous entity. The results differ just as much when comparing the different segments of the informal sector to each other as they do when comparing them to the formal sector.

Time (√*YearsCurrent*) is found to have significant effects on participation for natives as well as migrants, and the effects appear stronger for migrants. Starting with natives, it is found that *YearsCurrent* is negatively correlated with the probability of employment in agriculture, which may be due to low inter-sector mobility. If a typical agricultural worker devotes all of his/her life to farming, there should be a negative correlation between the probability of employment and the amount of time used for other purposes. It may also be indicative of low unemployment rates and that vacancies are filled quickly. In the other sectors (i.e. self-employed and wage workers) the results suggest the opposite, namely that *YearsCurrent* has a positive effect. The effect is strongest for uncovered wage workers. One explanation for this could be a higher importance of

social capital and a lower transparency when looking for informal as opposed to formal wage work. Also, a commonly used characteristic to describe the informal sector is that it is "easy to enter", which may more accurately describe self-employment than uncovered wage work. This may compensate for any lack of transparency which may explain why *YearsCurrent* appears to have a similar effect for self-employed and covered wage workers.

As already mentioned, there are also significant migrant effects *(√YearsCurrent*Migrant*), which are positive in all sectors except in agriculture. It appears that migrants better utilize their time for the purpose of finding employment. This result may not be surprising considering that work is often the main motivation to migrate. However, the empirical analysis possibly overestimates the migrant effects since there is no information about persons who have returned to their origin because they have not been able to find a job. The negative migrant effect in agriculture could be due to low unemployment among farmers. Hence, those who migrate to work in agriculture may find paid employment immediately, which suggests that migrants who spend time doing something else have moved for other reasons. For migrants, the total effect from *YearsCurrent* appears equally strong for uncovered and covered wage workers, as well as for the self-employed. This could be due to a lower degree of migrant discrimination among self-employed and covered wage workers. It could also indicate a different search intensity and suggest that migrants look more vigorously for formal employment than natives.

For earnings, the results indicate that time has significantly negative and positive effects in agriculture and the formal sector (covered wage workers). The number of years spent in the current employment (*Experience*) affects earnings positively in the formal sector and negatively in agriculture. The negative effect in agriculture is hard to interpret but could reflect the fact that people who stay in agriculture are less productive than those who leave to find other jobs. The insignificant effect for uncovered wage workers and self-employed may indicate that they have little chance to affect their earnings, which does not appear to be the case for covered wage workers. The migrant effect (*√Experience*Migrant)* is found to be insignificant in all sectors except for uncovered wage workers where the effect is significantly positive. The lack of financial support from relatives may potentially explain why migrants are more motivated to work hard than natives. This may be particularly true if working conditions are poor, but does not

explain, however, why the effect is insignificant for the self-employed but significant for uncovered wage workers.

Overall, the results suggest that time does matter, for migrants as well as natives, which may be due to many factors. Noteworthy is that for natives, *YearsCurrent* affects the probability of employment for uncovered wage workers more positively than for self-employed and covered wage workers. As mentioned above, this could be due to a higher importance of social capital for informal wage workers, whereas finding self-employment does not have similar requirements. The importance of social networks as a common feature of the informal sector may better describe the situation for uncovered wage workers, whereas "ease of entry" is a more accurate term for the self-employed. Further, *Experience* is only found to have a positive effect on earnings for covered wage workers. This may indicate that it is easier to affect your earnings in the formal sector than in the informal sector and hence efficiency is better rewarded in the formal than in the informal sector. Another important finding is the general support of positive migrant effects as opposed to migrant discrimination in all sectors except agriculture. Migrants are found to have higher chances of employment for any non-farming activity. It is also shown that migrants have significantly higher earnings when performing uncovered wage work.

For future research, it would be crucial to more thoroughly investigate how the allocation of time relates to different indicators of social capital and the productivity levels of workers. This would be needed in order to more directly isolate potential effects associated with the individual allocation of time across different residences.

References

Ahlerup, P., Olsson, O. and D. Yanagizawa (2008), "Social capital vs institutions in the growth process", Forthcoming *European Journal of Political Economy.*

Banerje, B. (1983), "The role of the informal sector in the migration process: A test of probabilistic migration models and labour market segmentation for India", *Oxford Economic Papers 35*, pp. 399-422.

Bjornskov, C. (2006), "The multiple facets of social capital" *European Journal of Political Economy* Vol. 22 pp. 22-40.

Boruguignon, F.; Fournier M. and M. Gurgand (2004), " Selection Bias Corrections Monte-Carlo Comparisons", *Journal of Economic Surveys, pp. 174-205.*

Chen, M.A. (2005), "Rethinking the Informal Economy: Linkages with the Formal Economy and the Eormal Regulatory Environment", *Research Paper No.2005/10, World Institute for Development Economics Research.*

Cohen, B. and House, W.J (1996), "Labor Market Choices, Earnings and Informal Networks in Khartoum, Sudan" *Economic Development and Cultural Change,* pp. 589-618.

Davidson R. and J.G. MacKinnon (2004), "Econometric Theory and Methods", *Oxford: University Press.*

De Soto, H. (1989), "The other path: the invisible revolution of the third world", *I.B. TAURIS and Co Ltd.*

Dubin J.A. and D.L. McFadden (1984), "An Econometric Analysis of Electric Appliance Holdings and Consumption", *Econometrica,* Vol 52, 345-362.

Fafcamps, M. and B. Minten, 2002, "Returns to social networks capital among traders" *Oxford Economic Papers pp. 173-206.*

Fields, G.S. (1975), "Rural-Urban Migration, Urban Employment and Underemployment, and Job-Search Activity in LDCs", *Journal of Development Economics 2,* pp. 165-187.

Fields, G.S. (2005), "A guide to Multisector Labor Market Models", *Unpublished paper prepared for the World Bank.*

Gërxhani, K. (2004), "The informal sector in developed and less developed countries: a literature survey", *Public choice 120,* pp. 267-300.

Gindling, T.H. (1991) "Labor Market Segmentation and the determination of wages in the Public, Private-Formal and informal sectors in San José, Costa Rica" *Economic Development and Cultural Change,* pp. 585-605.

Granovetter, M. (1983), "The Strength of Weak Ties: A Network Theory Revisited" *Sociological Theory, Vol .1,* pp. 201-233.

Granovetter, M. (1995), "Getting a Job: a Study of Contacts and Careers" *Chicago: University Press of Chicago.*

Harris J., and M. Todaro (1970), "Migration, Unemployment and Development: A Two-Sector Analysis", *American Economic Review* 40, pp.126-142.

Hart, K. (1970), "Small-scale entrepreneurs in Ghana and development planning", *Journal of Development studies 6,* pp. 104-120.

International Labor office (1972), "Employment, income and equality: A strategy for increasing productivity in Kenya", *Geneva (ILO*).

International Labor Office (2002), "Decent Work and the informal economy" *Geneva (ILO).*

Landa, J.T. (1981), "A Theory of the Ethnically Homogenous Middleman Group: An Institutional Alternative to Contract Law", *The Journal of Legal Studies Vol.10, No.2* pp- 349-362.

Levi, M. (1988), "Of Rule and Revenue" ,*University of California Press, Berkely.*

Lassen D.D (2007), "Ethnic divisions, trust , and the size of the informal sector", *Journal of Economic Behavior and Organization Vol 63., pp. 423-438.*

Lee, L-F. (1983), "General Econometric Models with Selectivity", *Econometrica, Vol. 51, No 2.* pp. 507-512.

Lewis, W.A. (1954), "Economic Development with Unlimited Supplies of Labour", *The Manchester School of Economics and Social Studies 22,* pp. 139-191.

Long, S.J. (1997), "Regression Models for Categorical and Limited Dependent Variables", *SAGE publications.*

Maloney, W.F. (2004), "Informality Revisited", *World Development vol 32, No. 7,* pp. 1159-1178.

Mazumdar, D. (1976), "The Rural-Urban Wage gap, Migration and the Shadow Wage", *Oxford University Press*, pp. 406-425.

Mitra, A. (2004), "Informal Sector, Networks and Intra-City Variations in Activities: Findings from the Delhi Slums", *Review of Urban and Regional Development Studies*, pp. 154-169

Pradhan, M. and A. Van Soest (2005), "Formal and informal sector employment in urban areas of Bolivia", *Labor Economics 2,* pp. 275-297.

Tansel, A. (1999) "Private-Public Employment Choice", Wage Differentials and Gender in Turkey", *Working Paper no. 797, Economic Growth Center, Yale University.*

Telles, E.E. (1993), "Urban Labor Market Segmentation and Income in Brazil" *Economic Development and Cultural Change,.*pp. 231-249.

Verbeek, M*,(2000), "*A Guide To Modern Econometrics"*, John Wiley and Sons, LTD.*

Vijverberg, W.P.M. and A Zeager, Lester (1994), "Comparing earning profiles in urban areas of an LDC: Rural-to-urban migrants vs. native workers", *Journal of Development Economics vol 45.* pp 177-199.

Williams, C.C, and J. Round (2007), "Rethinking the Nature of the Informal Economy: Some lessons from Ukraine", *International Journal of Urban and Regional Research,.*World Bank (2004), "Poverty in Guatemala", *A World Bank Country Study. Data*

World Bank (2000) "Guatemalan Encovi Survey" *Living Measurements studies of the World Bank.*

Appendix

Table 3.7 Labor market participation in Guatemala
(# individuals, % shares are in parentheses)

	Unpaid	Agriculture	Self-employed	Uncovered Wage Workers	Covered Wage Workers	Unemployed
Age						
18-24	620	572	289	912	482	1769
	(13.35)	(12.32)	(6.22)	(19.64)	(10.38)	(38.09)
25-34	294	788	588	813	625	1358
	(6.58)	(17.64)	(13.17)	(18.2)	(13.99)	(30.41)
35-45	150	762	640	512	493	1021
	(4.19)	(21.3)	(17.89)	(14.31)	(13.78)	(28.54)
45-54	112	642	513	323	292	787
	(4.2)	(24.05)	(19.22)	(12.1)	(10.94)	(29.49)
55-65	59	488	310	173	70	664
	(3.34)	(27.66)	(17.57)	(9.81)	(3.97)	(37.64)
Sex						
Male	(589)	(2931)	(889)	(1641)	(1308)	(662)
	7.34	36.55	11.08	20.46	16.31	8.25
Female	(646)	(321)	(1451)	(1092)	(654)	(4937)
	7.1	3.53	15.94	12	7.19	54.25
Ethnicity						
Indigenous	653	1743	884	900	353	2064
	(9.9)	(26.42)	(13.4)	(13.64)	(5.35)	(31.29)
Non indigenous	582	1509	1456	1833	1609	3535
	(5.53)	(14.34)	(13.84)	(17.42)	(15.29)	(33.59)
Language Skills						
Spanish Speakers	1062	2819	2149	2624	(950	4743
	6.92	18.37	14	17.1	12.71	30.91
Non Spanish Speakers	173	433	191	109	12	856
	(9.75)	(24.41)	(10.77)	(6.14)	(0.68)	(48.25)

Source: World Bank & author's calculation. The cohort percentage shares are in parentheses

Table 3.7 continued

	Unpaid	Agriculture	Self-employed	Uncovered Wage Workers	Covered Wage Workers	Unemployed
Education						
No School	399	1554	811	640	171	2507
	(6.56)	(25.55)	(13.33)	(10.52)	(2.81)	(41.22)
Primary School	722	1620	1253	1465	774	2353
	(8.82)	(19.79)	(15.3)	(17.89)	(9.45)	(28.74)
Secondary School	97	54	211	459	681	606
	(4.6)	(2.56)	(10.01)	(21.77)	(32.31)	(28.75)
University	17	22	57	169	334	123
	(2.35)	(3.05)	(7.89)	(23.41)	(46.26)	(17.04)
Civil Status						
Married	623	2620	1768	1568	1292	4044
	(5.23)	(21.99)	(14.84)	(13.16)	(10.84)	(33.94)
Not Married	612	632	572	1165	670	1555
	(11.76)	(12.14)	(10.99)	(22.38)	(12.87)	(29.87)
Married men	200	2450	756	1103	979	256
	(3.48)	(42.65)	(13.16)	(19.2)	(17.04)	(4.46)
Unmarried men	389	481	133	538	329	406
	(17.09)	(21.13)	(5.84)	(23.64)	(14.46)	(17.84)
Geography						
Rural	852	2632	922	950	458	3216
	(9.44)	(29.15)	(10.21)	(10.52)	(5.07)	(35.61)
Urban	383	620	1418	1783	1504	2383
	(4.73)	(7.66)	(17.53)	(22.04)	(18.59)	(29.45)
Metropolitan	76	62	343	528	586	566
	(3.52)	(2.87)	(15.87)	(24.43)	(27.12)	(26.19)
Non Metropolitan	1159	3190	1997	2205	1376	5033
	(7.75)	(21.32)	(13.35)	(14.74)	(9.2)	(33.64)
Migrant Status						
Natives	939	2334	1420	1751	1085	3625
	(8.42)	(20.93)	(12.73)	(15.7)	(9.73)	(32.5)
Migrants	294	912	914	971	873	1956
	(4.97)	(15.41)	(15.44)	(16.4)	(14.75)	(33.04)

Source: World Bank & author's calculation. The cohort percentage shares are in parentheses

Table 3.8 Average hourly earnings in Guatemal for 18-65 year old individuals

	Agriculture	Self-employed	Uncovered wage workers	Covered Wage Workers	∑ observations
Total	4.4	7.2	8.4	14.4	
	(2918)	(2291)	(2587)	(1921)	9717
Age					
18-24	3.5	5.9	7.1	8.8	
	(533)	(280)	(851)	(472)	2136
25-34	3.3	8.5	7.4	12.9	
	(709)	(573)	(775)	(613)	2670
35-45	5.2	6.3	10.6	19.5	
	(686)	(631)	(491)	(478)	2286
45-54	4.4	6.2	10.4	17.6	
	(573)	(502)	(306)	(288)	1669
55-65	5.8	9.3	10.5	16.4	
	(417)	(305)	(164)	(70)	956
Sex					
Female	3.9	5.7	6.6	14.2	
	(291)	(1417)	(1044)	(641)	3393
Male	4.4	9.7	9.7	14.5	
	(2627)	(874)	(1543)	(1280)	6324
Ethnicity					
Indigenous	3.0	4.3	5.4	11.6	
	(1554)	(868)	(856)	(348)	3626
Non indigenous	5.9	8.9	9.9	15.0	
	(1364)	(1423)	(1731)	(1573)	6091
Language Skills					
Spanish Speakers	4.7	7.6	8.7	14.4	
	(2524)	(2101)	(2482)	(1909)	9016
Non Spanish Speakers	2.3	2.5	2.7	8.2	
	(394)	(190)	(105)	(12)	701
Education					
No School	3.3	5.1	4.9	11.4	
	(1371)	(796)	(602)	(169)	2938
Primary School	4.2	6.5	5.6	8.0	
	(1480)	(1232)	(1401)	(760)	4873
Secondary School	33.1	17.0	13.7	16.5	
	(48)	(201)	(428)	(665)	1342
University	28.5	18.8	33.5	26.5	
	(17)	(54)	(156)	(325)	552
Geographical Location					
Metropolitan	8.7	8.8	16.8	16.7	
(Guatemala City)	(49)	(334)	(492)	(567)	1442
Non Metropolitan	4.3	6.9	6.5	13.4	
(Outside Guatemala City)	(2869)	(1957)	(2095)	(1354)	8275
Migrant Status					
Natives	3.7	5.9	7.4	13.3	
	(2083)	(1392)	(1663)	(1065)	6203
Migrants	6.1	9.3	10.4	15.8	
	(829)	(893)	(913)	(852)	3487

Source: World Bank (2000) & author's calculations. Numbers of observations are in parentheses.

The currency is Guatemalan Quetzals. At the time of the Survey the official rate of exchange was US$=7.7 Quetzals.

Table 3.9 Correlations between explanatory variables in the multionmial regressions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 Male	1.00																				
2 Spanish	0.07	1.00																			
3 Indigenous	0.03	-0.36	1.00																		
4 Primary School	0.06	0.30	-0.23	1.00																	
5 Secondary School	-0.06	0.13	-0.22	0.32	1.00																
6 University	0.00	0.07	-0.13	0.16	0.50	1.00															
7 NonMetropolitan	0.07	-0.11	0.23	-0.12	-0.21	-0.23	1.00														
8 Married	0.18	-0.05	0.08	-0.08	-0.10	-0.03	0.05	1.00													
9 Household Size	0.05	-0.08	0.13	-0.07	-0.15	-0.09	0.13	0.00	1.00												
10 Married*Male	0.72	0.02	0.06	-0.02	-0.09	-0.02	0.07	0.65	0.03	1.00											
11 Age < 25	0.00	0.02	0.01	0.17	0.04	-0.03	0.01	-0.40	0.08	-0.27	1.00										
12 Age 25-34	-0.01	0.04	0.00	0.11	0.05	0.02	0.01	0.10	-0.06	0.05	-0.35	1.00									
13 Age 45-54	0.00	-0.04	-0.01	-0.14	-0.05	0.00	-0.01	0.13	0.01	0.09	-0.25	-0.27	1.00								
14 Age >55	0.03	-0.05	0.02	-0.20	-0.10	-0.04	0.02	0.05	-0.11	0.08	-0.19	-0.20	-0.14	1.00							
15 NonMetropolitan	-0.10	0.15	-0.06	0.14	0.21	0.04	0.31	-0.04	-0.08	-0.08	-0.02	0.01	0.01	-0.01	1.00						
16 √YearsCurrent	-0.11	-0.05	0.08	-0.02	0.00	-0.01	0.07	-0.05	0.02	-0.10	-0.10	-0.03	0.08	0.06	0.06	1.00					
17 √YearsCurrent*Migrant	-0.09	0.09	-0.18	0.02	0.05	0.04	-0.13	0.02	-0.08	-0.05	-0.10	-0.02	0.06	0.07	0.03	0.03	1.00				
18 Conversation	-0.01	-0.01	0.02	-0.04	-0.10	-0.05	-0.07	0.01	0.01	-0.01	-0.01	0.00	0.01	0.00	-0.19	0.03	-0.02	1.00			
19 Assistance - Family	-0.01	0.03	-0.02	0.05	0.05	0.02	-0.03	-0.01	-0.04	0.00	0.00	0.03	-0.03	-0.02	0.02	0.01	-0.02	-0.03	1.00		
20 Assistance - Neighbours and Friends	0.05	-0.02	0.04	-0.07	-0.10	-0.08	0.16	-0.01	0.06	0.03	0.00	-0.01	0.00	0.02	-0.04	-0.01	-0.06	0.00	0.11	1.00	
21 Assistance - Religious Groups, etc.	0.01	-0.05	0.04	-0.03	-0.03	-0.02	0.06	0.01	0.03	0.01	0.01	-0.01	0.01	0.01	-0.03	-0.03	-0.01	-0.01	-0.10	-0.05	1.00

Table 3.10 Correlations between explanatory variables in the wage regressions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 Household Size	1.00																		
2 NonMetropolitan*Urban	-0.08	1.00																	
3 Age < 25	0.04	-0.01	1.00																
4 Age 25-34	-0.06	0.00	-0.33	1.00															
5 Age 45-54	0.03	0.01	-0.24	-0.28	1.00														
6 Age > 55	-0.09	-0.01	-0.18	-0.20	-0.15	1.00													
7 Conversation	0.02	-0.21	0.00	0.00	0.01	0.00	1.00												
8 Assistance - Family	-0.05	0.01	0.01	0.03	-0.03	-0.03	-0.02	1.00											
9 Assistance - Neighbours and Friends	0.06	-0.04	0.00	-0.01	0.01	0.02	0.01	0.10	1.00										
10 Assistance - Religious Groups, etc.	0.03	-0.02	-0.02	0.00	0.02	0.01	-0.01	-0.09	-0.06	1.00									
11 √Experience	0.04	-0.08	-0.36	-0.17	0.25	0.31	0.00	-0.02	0.07	0.04	1.00								
12 √Experience*Migrant	-0.04	-0.02	-0.19	-0.08	0.13	0.16	-0.04	-0.03	0.00	0.03	0.36	1.00							
13 Male	0.06	-0.10	-0.01	0.00	0.00	0.03	0.00	-0.01	0.06	0.01	0.17	0.06	1.00						
14 Spanish	-0.07	0.14	0.03	0.04	-0.04	-0.04	-0.02	0.03	-0.02	-0.04	-0.14	0.05	0.05	1.00					
15 Indigenous	0.12	-0.05	-0.01	0.00	0.00	0.03	0.03	-0.03	0.03	0.03	0.16	-0.14	0.05	-0.35	1.00				
16 Primary School	-0.08	0.13	0.15	0.12	-0.13	-0.19	-0.04	0.04	-0.07	-0.02	-0.22	-0.04	0.06	0.29	-0.24	1.00			
17 Secondary School	-0.14	0.20	0.05	0.05	-0.06	-0.11	-0.11	0.06	-0.09	-0.03	-0.17	0.00	-0.07	0.13	-0.22	0.33	1.00		
18 University	-0.08	0.03	-0.02	0.02	0.00	-0.05	-0.05	0.02	-0.08	-0.01	-0.07	0.03	-0.01	0.07	-0.13	0.16	0.50	1.00	
19 NonMetropolitan	0.12	0.34	-0.01	0.00	0.00	0.02	-0.08	-0.04	0.16	0.06	0.11	-0.08	0.08	-0.11	0.23	-0.13	-0.20	-0.22	1.00

Table 3.11 Coefficient Estimates from the Multinomial Regressions, Assistance Variables and Conversation included

Agriculture	Coefficient	Robust Std. Err.	z	P-value	[95% Conf.	Interval]
Male	1.127	0.137	8.210	0.000	0.858	1.396
Spanish	-0.019	0.131	-0.140	0.886	-0.276	0.238
Indigenous	-0.056	0.084	-0.660	0.506	-0.221	0.109
Primary School	-0.548	0.091	-6.000	0.000	-0.726	-0.369
Secondary School	-1.008	0.188	-5.370	0.000	-1.376	-0.640
University	0.652	0.381	1.710	0.087	-0.096	1.399
NonMetropolitan	1.409	0.193	7.300	0.000	1.031	1.787
Married	-0.841	0.148	-5.680	0.000	-1.131	-0.551
Household Size	-0.102	0.014	-7.510	0.000	-0.129	-0.075
Married*Male	2.436	0.180	13.500	0.000	2.082	2.789
Age <25	-1.459	0.128	-11.440	0.000	-1.709	-1.209
Age 25-34	-0.680	0.125	-5.430	0.000	-0.925	-0.434
Age 35-4	-0.040	0.149	-0.270	0.789	-0.332	0.252
Age >55	0.039	0.179	0.220	0.827	-0.312	0.390
NonMetropolitan*Urban	-0.437	0.093	-4.720	0.000	-0.619	-0.256
√YearsCurrent	0.003	0.021	0.160	0.873	-0.038	0.045
√YearsCurrent*Migrant	-0.054	0.034	-1.590	0.111	-0.119	0.012
Conversation	0.279	0.080	3.490	0.000	0.122	0.436
Assistance - Family	-0.015	0.077	-0.190	0.849	-0.166	0.137
Assistanc - Neighbours and Friends	0.007	0.081	0.080	0.936	-0.152	0.165
Assistance - Religious -Groups etc.	-0.233	0.117	-1.990	0.047	-0.462	-0.003
Constant	-0.041	0.293	-0.140	0.889	-0.614	0.533
Selfemployed						
Male	-1.281	0.140	-9.160	0.000	-1.555	-1.007
Spanish	0.077	0.138	0.560	0.578	-0.194	0.348
Indigenous	-0.408	0.086	-4.720	0.000	-0.577	-0.238
Primary School	0.087	0.094	0.920	0.356	-0.097	0.270
Secondary School	-0.216	0.144	-1.500	0.133	-0.497	0.066
University	0.065	0.313	0.210	0.835	-0.549	0.680
NonMetropolitan	-1.073	0.150	-7.150	0.000	-1.367	-0.779
Married	-0.054	0.112	-0.480	0.628	-0.275	0.166
Household Size	-0.124	0.014	-8.690	0.000	-0.152	-0.096
Married*Male	1.839	0.174	10.580	0.000	1.498	2.179
Age <25	-1.651	0.129	-12.790	0.000	-1.904	-1.398
Age 25-34	-0.682	0.121	-5.610	0.000	-0.920	-0.444
Age 35-4	-0.062	0.145	-0.430	0.668	-0.345	0.221
Age >55	-0.104	0.178	-0.580	0.559	-0.452	0.245
NonMetropolitan*Urban	0.974	0.089	10.890	0.000	0.799	1.150
√YearsCurrent	0.142	0.021	6.730	0.000	0.101	0.184
√YearsCurrent*Migrant	0.145	0.030	4.760	0.000	0.085	0.204
Conversation	-0.125	0.080	-1.560	0.119	-0.281	0.032
Assistance - Family	0.014	0.078	0.180	0.860	-0.138	0.166
Assistanc - Neighbours and Friends	-0.331	0.084	-3.930	0.000	-0.496	-0.166
Assistance - Religious -Groups etc.	-0.317	0.122	-2.590	0.010	-0.556	-0.077
Constant	2.423	0.264	9.190	0.000	1.906	2.940

Uncovered Wage Workers	Coefficient	Robust Std. Err.	z	P-value	[95% Conf.	Interval]
Male	-0.534	0.112	-4.750	0.000	-0.754	-0.314
Spanish	0.390	0.149	2.610	0.009	0.097	0.682
Indigenous	-0.484	0.083	-5.860	0.000	-0.646	-0.323
Primary School	-0.052	0.093	-0.560	0.578	-0.234	0.131
Secondary School	0.427	0.131	3.270	0.001	0.171	0.683
University	0.398	0.287	1.390	0.165	-0.164	0.961
NonMetropolitan	-1.501	0.144	-10.410	0.000	-1.783	-1.218
Married	-0.995	0.114	-8.750	0.000	-1.217	-0.772
Household Size	-0.088	0.013	-6.570	0.000	-0.115	-0.062
Married*Male	2.324	0.155	15.010	0.000	2.021	2.628
Age <25	-0.506	0.124	-4.090	0.000	-0.749	-0.263
Age 25-34	-0.135	0.124	-1.090	0.276	-0.377	0.108
Age 35-4	-0.298	0.152	-1.960	0.050	-0.597	0.000
Age >55	-0.543	0.188	-2.890	0.004	-0.912	-0.175
NonMetropolitan*Urban	1.087	0.087	12.540	0.000	0.917	1.256
√YearsCurrent	0.193	0.021	8.990	0.000	0.151	0.235
√YearsCurrent*Migrant	0.122	0.031	3.990	0.000	0.062	0.182
Conversation	-0.161	0.077	-2.090	0.037	-0.312	-0.010
Assistance - Family	-0.066	0.075	-0.880	0.378	-0.214	0.081
Assistanc - Neighbours and Friends	-0.290	0.081	-3.570	0.000	-0.449	-0.131
Assistance - Religious -Groups etc.	-0.377	0.119	-3.170	0.002	-0.611	-0.144
Constant	2.016	0.265	7.610	0.000	1.497	2.535
Covered Wage Workers						
Male	-0.412	0.131	-3.140	0.002	-0.669	-0.155
Spanish	1.226	0.319	3.840	0.000	0.601	1.851
Indigenous	-0.870	0.097	-8.970	0.000	-1.060	-0.680
Primary School	0.543	0.119	4.570	0.000	0.310	0.777
Secondary School	1.443	0.133	10.850	0.000	1.182	1.703
University	0.508	0.283	1.790	0.073	-0.047	1.063
NonMetropolitan	-1.733	0.153	-11.330	0.000	-2.033	-1.433
Married	-0.858	0.133	-6.470	0.000	-1.118	-0.598
Household Size	-0.120	0.016	-7.540	0.000	-0.151	-0.089
Married*Male	2.551	0.177	14.440	0.000	2.205	2.898
Age <25	-0.966	0.136	-7.130	0.000	-1.232	-0.700
Age 25-34	-0.346	0.131	-2.640	0.008	-0.602	-0.089
Age 35-4	-0.236	0.161	-1.470	0.142	-0.551	0.079
Age >55	-1.159	0.219	-5.290	0.000	-1.589	-0.730
NonMetropolitan*Urban	1.081	0.100	10.800	0.000	0.885	1.278
√YearsCurrent	0.159	0.023	6.880	0.000	0.113	0.204
√YearsCurrent*Migrant	0.157	0.032	4.850	0.000	0.094	0.221
Conversation	-0.128	0.086	-1.480	0.138	-0.296	0.041
Assistance - Family	0.077	0.084	0.920	0.358	-0.087	0.241
Assistanc - Neighbours and Friends	-0.381	0.094	-4.060	0.000	-0.564	-0.197
Assistance - Religious -Groups etc.	-0.202	0.135	-1.500	0.134	-0.466	0.062
Constant	0.400	0.398	1.010	0.314	-0.379	1.179

Table 3.12 Coefficient Estimates from the multinomial regressensions, Assistance Variables and Conversation excluded

Agriculture	Coefficient	Robust Std. Err.	z	P-value	[95% Conf.	Interval]
Male	-1.114	0.142	-7.850	0.000	-1.392	-0.836
Spanish	0.011	0.130	0.090	0.931	-0.243	0.266
Indigenous	0.069	0.084	0.810	0.415	-0.097	0.234
Primary School	0.537	0.092	5.820	0.000	0.356	0.718
Secondary School	1.045	0.190	5.490	0.000	0.672	1.418
University	-0.642	0.384	-1.670	0.094	-1.394	0.110
NonMetropolitan	-1.369	0.192	-7.140	0.000	-1.745	-0.993
Married	0.846	0.148	5.710	0.000	0.555	1.136
Household Size	0.104	0.013	7.730	0.000	0.077	0.130
Married*Male	-2.425	0.184	-13.160	0.000	-2.786	-2.064
Age <25	1.471	0.130	11.320	0.000	1.217	1.726
Age 25-34	0.680	0.124	5.500	0.000	0.438	0.922
Age 35-4	0.047	0.145	0.320	0.746	-0.237	0.330
Age >55	-0.039	0.174	-0.220	0.825	-0.380	0.303
NonMetropolitan*Urban	0.467	0.090	5.190	0.000	0.291	0.644
√YearsCurrent	-0.008	0.020	-0.420	0.678	-0.047	0.030
√YearsCurrent*Migrant	0.059	0.034	1.730	0.084	-0.008	0.127
Constant	-0.166	0.276	-0.600	0.546	-0.707	0.374
Selfemployed						
Male	-2.393	0.151	-15.890	0.000	-2.688	-2.098
Spanish	0.067	0.116	0.570	0.566	-0.161	0.295
Indigenous	-0.331	0.071	-4.680	0.000	-0.470	-0.193
Primary School	0.640	0.073	8.720	0.000	0.496	0.784
Secondary School	0.834	0.176	4.750	0.000	0.490	1.179
University	-0.547	0.330	-1.660	0.097	-1.195	0.100
NonMetropolitan	-2.534	0.157	-16.160	0.000	-2.841	-2.226
Married	0.801	0.138	5.820	0.000	0.531	1.071
Household Size	-0.023	0.013	-1.770	0.076	-0.047	0.002
Married*Male	-0.591	0.179	-3.300	0.001	-0.942	-0.240
Age <25	-0.178	0.112	-1.580	0.114	-0.398	0.043
Age 25-34	-0.002	0.090	-0.020	0.982	-0.179	0.175
Age 35-4	-0.024	0.096	-0.250	0.804	-0.212	0.164
Age >55	-0.144	0.113	-1.280	0.200	-0.365	0.076
NonMetropolitan*Urban	1.489	0.074	20.240	0.000	1.345	1.633
√YearsCurrent	0.135	0.016	8.200	0.000	0.103	0.167
√YearsCurrent*Migrant	0.205	0.024	8.510	0.000	0.158	0.253
Constant	2.125	0.232	9.180	0.000	1.671	2.579

Uncovered Wage Workers	Coefficient	Robust Std. Err.	z	P-value	[95% Conf.	Interval]
Male	-1.642	0.131	-12.490	0.000	-1.900	-1.385
Spanish	0.382	0.128	2.970	0.003	0.130	0.633
Indigenous	-0.410	0.068	-6.030	0.000	-0.544	-0.277
Primary School	0.497	0.072	6.920	0.000	0.356	0.638
Secondary School	1.476	0.164	9.000	0.000	1.154	1.797
University	-0.211	0.298	-0.710	0.480	-0.795	0.374
NonMetropolitan	-2.949	0.151	-19.510	0.000	-3.245	-2.653
Married	-0.140	0.142	-0.980	0.325	-0.419	0.139
Household Size	0.014	0.012	1.170	0.243	-0.009	0.037
Married*Male	-0.106	0.167	-0.640	0.523	-0.433	0.220
Age <25	0.966	0.100	9.700	0.000	0.771	1.161
Age 25-34	0.543	0.089	6.070	0.000	0.367	0.718
Age 35-4	-0.258	0.102	-2.540	0.011	-0.457	-0.059
Age >55	-0.581	0.124	-4.690	0.000	-0.823	-0.338
NonMetropolitan*Urban	1.604	0.072	22.380	0.000	1.463	1.744
√YearsCurrent	0.185	0.017	10.670	0.000	0.151	0.219
√YearsCurrent*Migrant	0.184	0.024	7.610	0.000	0.136	0.231
Constant	1.654	0.233	7.100	0.000	1.197	2.110
Covered Wage Workers						
Male	-1.529	0.149	-10.270	0.000	-1.821	-1.237
Spanish	1.219	0.306	3.990	0.000	0.620	1.819
Indigenous	-0.795	0.082	-9.670	0.000	-0.957	-0.634
Primary School	1.097	0.101	10.830	0.000	0.898	1.295
Secondary School	2.497	0.162	15.450	0.000	2.180	2.813
University	-0.104	0.295	-0.350	0.724	-0.682	0.474
NonMetropolitan	-3.198	0.159	-20.090	0.000	-3.510	-2.886
Married	-0.004	0.155	-0.030	0.977	-0.307	0.298
Household Size	-0.019	0.015	-1.270	0.204	-0.047	0.010
Married*Male	0.128	0.186	0.690	0.489	-0.236	0.493
Age <25	0.509	0.113	4.510	0.000	0.288	0.730
Age 25-34	0.332	0.098	3.390	0.001	0.140	0.524
Age 35-4	-0.197	0.114	-1.730	0.084	-0.420	0.027
Age >55	-1.201	0.174	-6.900	0.000	-1.543	-0.860
NonMetropolitan*Urban	1.597	0.085	18.880	0.000	1.431	1.763
√YearsCurrent	0.151	0.019	7.890	0.000	0.113	0.188
√YearsCurrent*Migrant	0.218	0.027	8.100	0.000	0.165	0.271
Constant	0.136	0.367	0.370	0.710	-0.583	0.856

Table 3.13 Descriptive Statistics

Variable	Mean	Std. Dev.
Male	0.47	0.50
Spanish	0.90	0.30
Indigenous	0.39	0.49
Primary School	0.64	0.48
Secondary School	0.17	0.37
University	0.04	0.20
NonMetropolitan	0.87	0.33
Married	0.70	0.46
Household Size	5.97	2.67
Married*Male	0.34	0.47
Age < 25	0.27	0.44
Age 25-34	0.26	0.44
Age 45-54	0.16	0.36
Age > 55	0.10	0.30
NonMetropolitan*Urban	0.36	0.48
√YearsCurrent	3.76	1.95
√YearsCurrent*Migrant	0.68	1.48
Conversation	0.60	0.49
Assistance - Family	0.50	0.50
Assistance - Neighbours and Friends	0.31	0.46
Assistance - Religious Groups, etc.	0.10	0.30
√Experience	2.71	1.81
√Experience*Migrant	0.95	1.66

Figure 3.3 Time Spent on location and the probability of employment for migrants (Age 60)

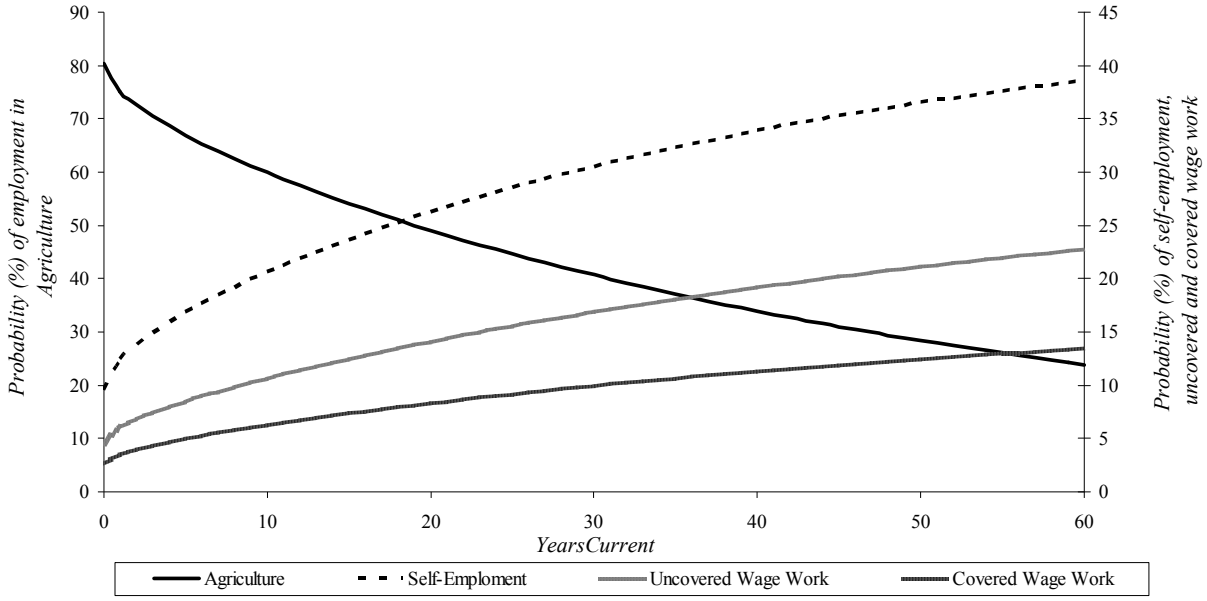


Figure 3.4 Time spent on location and the probability of employment for natives (Age 60)

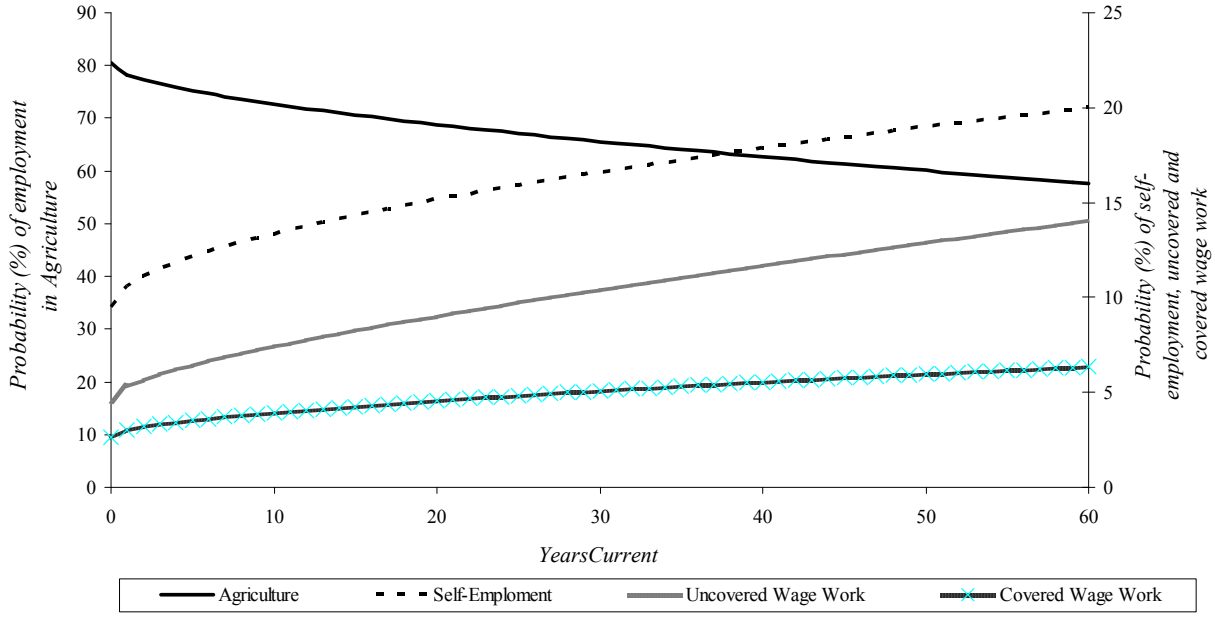


Figure 3.5 Time spent on location and the probability (%) of employment for migrants (Age 20)

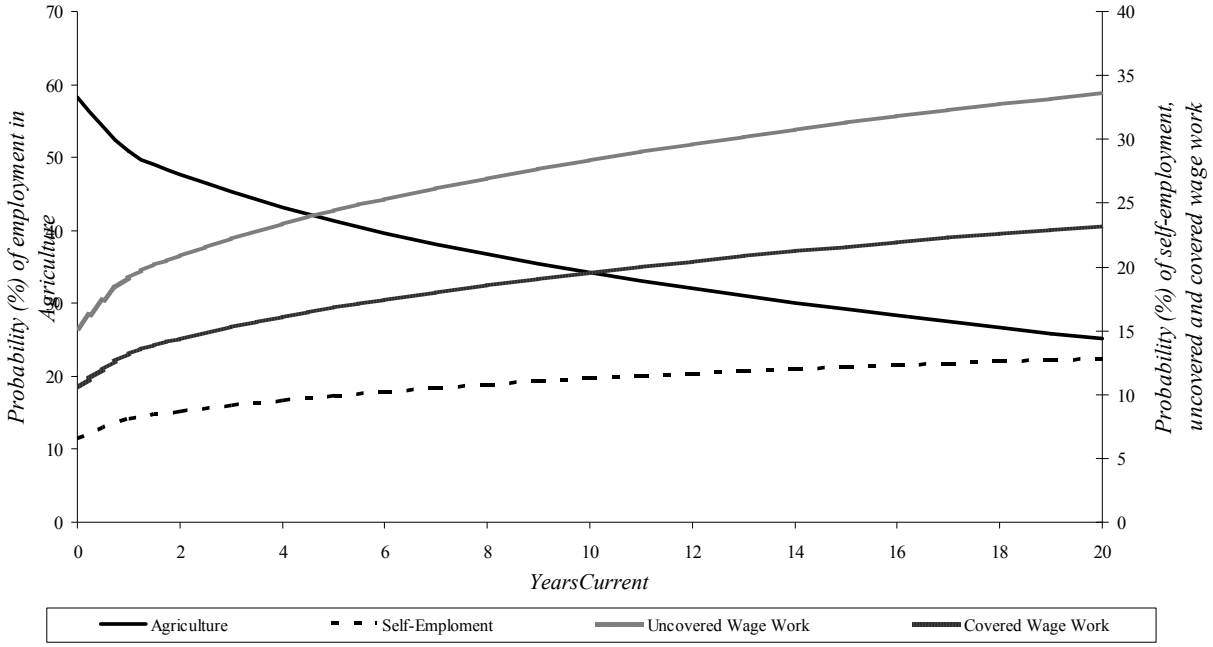


Figure 3.6 Time spent on location and the probability (%) of employment for natives (Age 20)