The Informal Sector in Mexico: Characteristics and Dynamics

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Abstract

This work analyzes the dynamics of the informal labor market in Mexico using information from the National Survey of Urban Employment (ENEU) and the urban section of the Quarterly National Employment Survey (ENET). In the first part, it compares three periods: 1990-1991, 1995-1996 and 2003-2004 to study the changes in eight of the labor market categories using transition matrices. The categories include dependent informal, dependent formal, employer, self-employed, public sector, not remunerated, unemployed and, inactive. In the second part, it uses a multinomial logit model with the mentioned categories as the dependent variable and it finds that age increases the probability of being in the informal sector and that education increases the probability of being employed in the formal or public sectors. The third part uses quantile regressions to explore the determination of salaries as function of the labor market categories. It is found that the categories employer and public sector have the highest returns.

Key words

Informal sector, Transition matrices, Quantile regressions, Labor force.

Resumen

Este trabajo analiza la dinámica del sector informal en México utilizando información de la Encuesta Nacional de Empleo Urbano (ENEU) y la parte urbana de la Encuesta Nacional de Empleo Trimestral (ENET)

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comparando primero tres periodos: 1990-1991, 1995-1996 y 2003-2004 para estudiar mediante el uso de matrices de transición los cambios en ocho categorías del mercado de trabajo: informal dependiente, formal dependiente, empleador, auto empleado, sector público, sin pago, desempleado e inactivo. En la segunda parte se utiliza el modelo multinomial logit, usando como variable dependiente las categorías mencionadas de la fuerza de trabajo, encontrando que la edad incrementa la probabilidad de estar en el sector informal y que la educación incrementa la probabilidad de estar en el sector formal o en el sector público. En la tercera parte se utilizan regresiones cuantílicas para estudiar la determinación de los salarios como función de las categorías en la fuerza de trabajo encontrándose que las categorías de empleador y sector público tienen los más altos retornos.

Palabras clave
Sector informal, Matrices de transición, Regresiones cuantílicas, Fuerza de trabajo.

Introduction

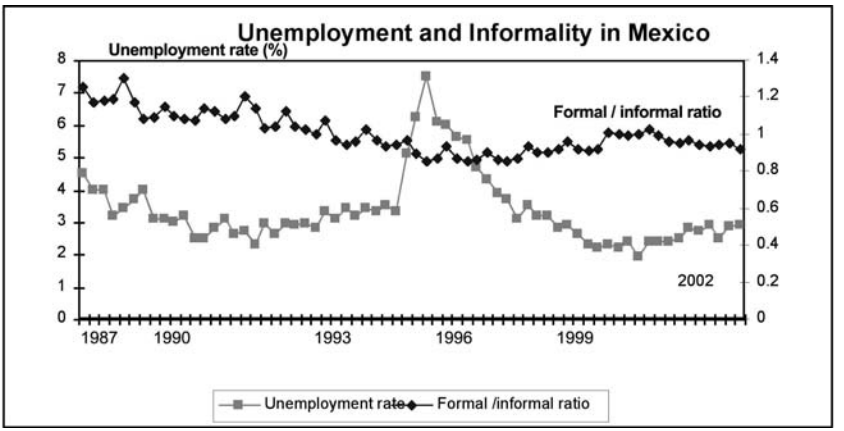
According to data from the *Encuesta Nacional de Empleo* (National Employment Survey), in the last few years about 60% of Mexican working population has been working with no social security, considering it as a proxy for informal labor. This means that only about 18 out of 40 million people have social security as a work benefit.

ECLAC (2005) has estimated that seven out of ten jobs in Latin America are created in the informal sector, being Mexico a generator of more informal than formal jobs. The rate of job generation occurs mainly in micro business, the larger employers in the country. On the other hand, the demographic pressure on the labor market has caused a higher growth rate on the supply than on the demand side of the labor market. According to INEGI, about 10 million workers are expected to join the market in the next years, added to the fact that nowadays there are about eight million inactive individuals waiting their turn to join the market. Hence, the creation of formal jobs becomes a main challenge for the economy. It is in this context that becomes essential to identify informal workers, to know their characteristics and disadvantages com-

pared to those in the formal sector, and to know the causes that pull or push workers to enter the informal sector.

It is well known that many individuals move to the informal sector due to the lack of opportunities in the formal sector. There are structural reasons to explain the size of the sector, mainly associated with the fixed costs that taxation and excessive regulations represent, and inadequate and weak links that prevail between the benefits of social security and the value workers give to those benefits (Garro, Meléndez y Rodríguez-Oreggia, 2005). An important variable highly correlated with informality is the percentage of working population not covered by mechanisms that protect them against risks, i.e. social security. The proportion of formal to informal jobs experienced a fall since the end of the 80's and until the mid 90's, followed by a slight recovery in the second half of the 90's. The crisis periods of 1994-95 and first half of this decade, have increased both informality and unemployment, as it can be observed in Figure 1.1

Figure 1.1



Source: World Bank (2004)

Recently, given no improvements in the labor market in Mexico (see World Bank report "Doing Business in 2004: Understanding Regulation"), unemployment increased but salaries did not decrease as expected. This might indicate a change in the way the labor market is working, which could be associated to a drop in inflation, which means that the wages reduction mechanism through price increases is disap-

pearing. It is possible that macroeconomic shocks could be associated with unemployment in the long-run, or with an increase in informality. There are implications of importance for public policies regarding social protection and the financing of these schemes.

Since this study focuses on the evaluation and examination of trends in the informal sector and its comparative dynamics, the estimation of labor participation in the formal and informal sectors, and the differences in wages and occupations are important to identify groups that are socially vulnerable. It is helpful to focus public policy making on those who have no social security coverage or have a precarious job.

According to INEGI, it has been estimated that by the next decade, more than ten million people will join the labor force, thus high grow rates are necessary in the economy, in order to be able to offer them a job. Moreover, INEGI estimates that about eight million people are currently unemployed and looking to join the labor market any moment. The importance of this study is based on what a hypothetical severe crisis of job generation could represent, given that the informal sector would be the most viable option to generate an income. One of the main challenges here is the incorporation of the informal sector to the formal one and for the generation of more formal employment in a sustained dynamic it is vital to learn the characteristics and evolution of the informal sector. If we consider that in the last years the growth rate of informal jobs has been higher than the one for formal jobs, this perspective should direct efforts on poverty fighting and employment to consider workers in the informal sector.

It is known that for some people informality represents a convenient decision, meaning flexibility and a certain status (according to Maloney, 1999), but on the other hand, informality represents important social costs. Informality traps workers and companies in low productivity operations, and it represents several causes that can difficult the implementation of public policies. The informal sector represents no security benefits, and most regulations are evaded, such as tax pay. Then again, a strict regulation and taxation, in a country with lax enforcement, could make informality to generate faster.

This study aims to examine and evaluate the trends of the informal sector, and analyze its characteristics compared to the formal sector. Probabilities of changing labor sector will be measured over a period of time by the use of transitional matrices between a formal and informal job. The probability of incorporating a new labor sector will be determined, subject to a set of socio-demographic variables, as well as the previous labor status. Wage incentives to education and job category according to income level of the worker will be calculated. The use of a dynamic view of sector movements will give a broader perspective on probabilities, progress, and fall backs that have taken place in moving from one sector to another. Additionally, the wage impact and choice of sector can obey a high heterogeneity, which will be considered through a methodology that allows the identification of individuals with similar characteristics in the income distribution curve.

The justification of this study is given by the possible public policies that can be focused on the reduction of informality. Steps needed to achieve so require a precise diagnose of those in the informal sector and the reasons of being there, together with the identification of winners and losers and their tendencies along time. For society as a whole, the benefits of reducing informality could be more, since not only more people would have social benefits, but they would contribute with their taxes to the social development of the country, reducing poverty and increasing economic development. Property rights would increase, allowing reduction of some costs, and access to services and credits would be granted and would take the advantages of market expansion.

Labor Markets and Informality: Different Theoretical Versions

The debate on how to classify and analyze the informal sector has included different perspectives. Several definitions have been coined, but two have been widely spread: in the seventies, Tokman (1978) generated a literature stream in which the informal sector is measured as a segment of the urban economy made of small businesses (less than five employees), and characterized by easy access, simple technology and a low capital-work ratio. This definition has been extensively used in studies in Latin America. However, another definition has now been

widely considered since the mid eighties, in which informality is classified as those activities which avoid government regulation (De Soto, 1986; Portes and Sassen-Koon, 1987).

International Labor Organization (ILO) has favored the use of business size to define informality; however, it is conceptually more appropriate to use the definition based on avoidance of regulations. By using the size-of-business definition, the problem raises on the determination of top number to define informality. Typically, five employees is the limit number, but there is no technical reason to establish that limit. There would not be a reason either to worry about size if the normative perspective shows interest in identifying workers with a job where regulations are avoided and as a consequence have no social security.

Aditionally, studies on informal workers frequently include self-employed and whereas self-employment is one of the main characteristics in Latin America, work conditions for self-employed and informal workers usually differ, as well as the regulations each one follows, so the analysis on informality should bear that in mind. It should also be considered that labor policies focused on a specific group end up affecting the labor market as a whole.

Generally, there are diverse streams of the literature trying to explain theoretically the existence of the informal sector in the labor market. Those streams shall be analyzed in the following subsections.

Labor Segmentation and Informality

Classic theory points out that the informal sector is a clear example of market economy: perfect, but segmented and with no links to the modern sector. The modern sector is considered unable to generate enough employment, so the excluded workers have to find a second best option, which is the case of the informal sector. The size of the informal sector therefore reflects the extent of the inefficiencies of the market and the reforms that have to be done, such as the increase in flexibility and efficiency in the labor market (World Bank, 1995).

Others, (see Inter-American Development Bank, 2004), have em-

phasized that high labor regulations, especially in Latin America, are an incentive to create informal jobs. Informality exists because the private sector has incentives to avoid regulations, due to the lack of appropriate reinforcement of these.

The suggestion of a dualism in the labor market was first established by Lewis (1954), who proposed a growth model focused on developing countries. There are two sectors in these economies, a capitalist one, modern and formal, and a subsistence economy, informal and traditional. Basically, workers have different wages depending on the sector of the economy where they work. Here, workers who do not find a job in the modern or formal sector have to take one in the informal one. However, when the formal sector expands, there shall be transferences to this sector from the informal one.

From a Human Capital perspective, (Schultz, 1961; Becker, 1962; Mincer, 1962), the approach would indicate that in order to have a duality in the labor market, different salaries between both sectors would have to exist among workers with similar personality and labor characteristics. In this case, workers with low salaries, bad job conditions and in the traditional or informal sector are perceived as low-productive and not willing to learn the abilities needed in the modern sector of the economy, where wages are relatively higher and better working conditions prevail, and the chances to enter the sector depend on capabilities (Doeringer y Piore, 1971).

Most literature is based on Harris and Todaro's (1970) model. It was first used to explain the migration caused when the expected salary in urban areas evens the marginal return of agricultural labor, which is why migration from rural areas to urban areas happens when any of the following is true: an increase in urban salaries; a reduction in urban unemployment; a reduction of agricultural productivity. By adjusting the model to the informal and formal sector, the informality can be seen as part of the market that is sent outwards, towards what is not covered by social benefits, since the remunerations are above the point of equilibrium in the formal sector.

From a competence theory perspective the informal sector is the non-

regulated part of the economy, under a frame where similar activities are also regulated. The economic activity moves freely from the formal to the informal sector, and the form the later one operates makes it impossible to apply legal action and regulation, hence the legal framework explains the formation of the informal sector. According to Portes, Castells and Benton (1989), companies in the modern sector aim to reduce costs through avoiding regulations and sub hiring workers not covered by social benefits.

Here, the informal sector is in disadvantage in a dual market. Ozorio, Alves and Graham (1995) have argued that "workers protected in the formal sector have higher average wages, vacations, pensions and legal protection at work. Opposed to those who cannot find a job in these companies and have to take their second best alternative in the informal sector, small companies or as self-employed, getting involved in intense activities of workforce and no social benefits. Based on this, the regulatory or union intervention, for instance, pushes the formal salaries above the level, so the immigrants, the young, the unemployed, "queue" to get a formal job, so the rest of the waiting time is spent on the informal sector.

Segmentation by Wage Difference

In the measurement of labor segmentation between formality and informality, comparing salaries has been the key point (Rosenzweig, 1989). However, there are two disadvantages to this approach (Maloney, 1999): the are characteristics not observed by the worker that can be correlated to the sector chosen and wages; the value of characteristics not observed might not be reported.

On the other hand, based on Rosen (1986), it was found that in theory informal wages should be higher than formal wages, in order to make up for the benefits not received. However, they could also be lower given the avoidance of tax payment. As for social security, there would be a compensatory difference to the informal sector for not having the benefits derived from social security, which are present in the formal sector.

There are other elements that do not make it clear that wage differ-

ences between formal and informal sector are due to the segmentation of the market. First, within a neoclassic model, it is assumed that all individuals have the same level of information. Nevertheless, if we think that informal workers have less information, this could be the reason why lower minimal wages are negotiated compared with formal ones.

Secondly, if we assume that labor regulations lead to the redistribution of rather higher salaries than lower ones, we are dealing with salary redistribution from the highest to the lowest salaries. It would be expected that the less educated workers compete for a formal job, since they benefit from the redistribution, while the most educated would prefer an informal job, and so a company that meets regulations would end up choosing more productive workers among those with less education, not among those who are more educated. Since there are non-observables that affect productivity, following this hypothesis there would be a wage premia to formality among less educated workers, but a salary to informality in those with more education.

Thirdly, based on the efficiency wage models by Stiglitz (1974), and Shapiro and Stiglitz (1984), we have that employers are willing to pay salaries above the optimal market level and so induce workers to make an higher productivity effort. If we assume that a formal job is also a strategic way to increase work effort (such as in the number of working hours), we would expect to find formal workers in companies that benefit more from lower levels of shirking. Here the difference in wages between formal and informal workers is given by the difference between employers in their capacity to monitor, instead of focusing on intrinsic characteristics of workers.

Segmentation by Mobility between Labor Sectors

Maloney (1999) offers an alternative perspective to segmentation based on the difference between formal and informal wages. He proposes an analysis of workers' labor mobility, using panel data through the conditioned probability of finding a worker in a given sector (formal/informal) at the end of a period t+1 having he started in a different sector in t. He argues there are reasons to believe that informality is preferred by a segment of workers, because of the characteristics of this sector (flexibility

of hours for instance), to the inference given by labor regulations, and to the relatively low productivity of the formal sector in underdeveloped countries.

Among other findings, Maloney mentions that many young workers move to the formal sector after spending some years in the informal sector. He also finds that a significant number of middle aged workers move from the formal to the informal sector. This evidence is interpreted as proof that workers are free to choose the sector they want to work in. For young workers, Maloney interprets that the informal sector is preferred over the formal because of the benefits and the training, hence they later on move to a formal job. Once they acquire sufficient experience and expertise, those workers prefer to leave their formal jobs to set up their own businesses. However, Maloney groups together in the informal sector those working in business with less than five employees and those who are self-employed. Additionally, it is not possible to learn from data if choosing the sector has been a self-made decision.

Other Considerations

Focusing on the labor market in Mexico, we face a difficulty adjusting these theories to practice. For instance, Maloney (1999) has found that labor segmentation is not necessarily true, but a preference for one or another. Krebs and Maloney (1999) also suggest that maybe workers move to the informal sector because they are more attracted to it than to the formal sector, and not necessarily because the informal sector pays salaries above the market optimal salary and leads to the creation of informality. Garro, Meléndez and Rodríguez-Oreggia (2005) found that value of benefits is observed only in large companies. In addition, Rodríguez-Oreggia (2005) found regional differences, since the value of social security could be higher in areas near the border with the USA .[1]

Based on Tokman (1978), the high trend of informality in Latin American countries exists because those countries are new to development and process of industrialization compared to more developed coun-

[1] *It was found that in Brazil segmentation may happen in the lowest income levels, while in the highest levels informality is chosen because of convenience (Tannuri-Pianto and Pianto, 2004).*

tries, and besides they are marginal in the global economy. According to Tokman, this context makes it difficult to generate more jobs, having a low investment and a large number of immigrants moving from rural to urban areas, which tends to create more informal jobs. However, this analysis gives no room to government intervention in public policy making.

From the perspective of globalization, Portes (1994) points out that it has had a relevant role in the growth of informality, since international competence takes companies to reduce labor costs in order to survive in the market by the use of outsourcing. Goldberg and Pavnick (2003) find that at studying the opening of trade related with informality, institutions are highly significative, since companies tend to respond to opening by a reduction of formal jobs when operating in a strict labor environment.

Reinforcing laws can also be an important cause of informality. Itzigsohn (2000) mentions, when comparing informal sectors in the Dominican Republic and Costa Rica, that the later one is lower due to a higher reinforcement of regulations, as a result of an important difference in the setting up and running of institutions. Auerbach, Genoni and Pagés (2005) consider it difficult to implement mandatory saving programs such as retirement programs in developing countries that do not apply enforcement, as it is the case in Latin America.

Auerbach, Genoni and Pagés (2005) also found that for several Latin American countries, there are similar patterns of contribution between employed and self-employed, between individuals and household characteristics, which suggest there are demand factors that explain the decision on contribution (formality), as well as the fact that some workers, such as those in small companies who earn less than the minimal wage, have no room in this formal market.

In this paper, the dynamic of informality regarding other labor status for individuals in Mexico is analyzed. First, probabilities of being in a sector will be calculated using transition matrices. Then, the decisions of joining a given sector will be analyzed depending on a set of sociodemographic factors and previous labor sector. Finally, wage incentives to education and to labor activity will be measured, depending on the

income level of the worker.

Labor Market Transitional Dynamics

This section aims to set evidence on the dynamics of switcing from formal to informal jobs by using Markov transition matrices, which describe a worker's probability of moving from one job category to another for a given period.

Markov Transition Matrices between Labor Sectors

In this section, we shall determine the mobility between sectors, using transition matrices (Markov's), considering the sector where the worker started and ended up at the end of five quarters using data from the National Urban Employment Survey (known in Spanish as Encuesta Nacional de Empleo Urbano or ENEU) and the urban part of the National Quarterly Employment Survey (Encuesta Nacional de Empleo Trimestral, ENET).

Transition matrices can be used in situations where there is a set of defined status or conditions, and there is a transition from one to another, and where being in a state depends on the previous one. They also require information on the previous state or condition. Due to the fact that elements in the matrices represent conditional probabilities, they should be read as an application of conditional probability to related events.

These matrices, called Markov, arrange in a matrix of ten the probabilities for a worker who started in a labor sector to be in the same or another one at the end of the period. Let us state there are only two sectors in the labor market: formal, denoted 0 and the informal, named 1. A degree one Markov's model would specify that the probability for a worker to be in the current period t in a given sector would depend on the prevailing state in the previous period, t-1. The stochastic process describing the dominant sector is defined by two transitive probabilities called *p* and *q*. If we arrange probabilities between sectors, we have:

Table 3.1

		t	
		Formal=0	Informal=1
t-1	Formal=0	*q*	*1-q*
	Informal=1	*1-p*	*p*

In Table 3.1 each row describes the probability of being in a given sector depending on the sector from the previous period. So, the probability of a worker who started in period (t-1) as formal (formal=0) and at the end of the period stays as formal would be q, while the probability of a worker who started the period as formal, but ended up as informal (informal=1) would be *1-q*. It is important to note that the possibilities are given within each line, so the probabilities should add up along each line.

Data

In order to analyze the transitional dynamics between sectors, we need panel data, which will allow us to follow up the same worker in a given period of time. Through the *Encuesta Nacional del Empleo Urbano* (ENEU) and the urban part of the *Encuesta Nacional de Empleo Trimestral* (ENET), it is possible to follow up a twenty percent of workers along five consecutive quarters. This means we have a rotation panel, where the fifth of all household selected are substituted each quarter. While longer time periods are needed in order to know what happens in a worker's life cycle, it is possible to identify in this period those workers who move between sectors, as well as their characteristics.

Three different periods of time are used. First of all, we use from the third quarter in 1990 to the third quarter in 1991, which represents a growth and relative bonanza period in the Mexican economy. Secondly, we use from the third quarter in 1995 to the third quarter in 1996, which corresponds to a period of crisis in the domestic economy. Finally, we use from the third quarter in 2003 to the third quarter in 2004, a period of stability in the economy. We tried to use the panel of the first periods in the survey, but many errors were found when trying to give a sequence (i.e. in dramatic changes of age, education, gender) so we chose the use of the period mentioned above in the early nineties.

Categories used derive from the labor market structure itself, which allows us to follow the Mexican employment survey. Thus, we suggest the use of the following categories:

Informal Employment: if the worker is in the private sector and has

no social security in his main job.

Formal Employment: if the worker is in the private sector and has social security from his main job.

Public Sector: if the worker has a job in the public sector.

Employer: if the individual states he is an employer.

Self-employed: if worker states he works on his own.

Without payment: if the worker states he is working but not receiving payment.

Unemployed: if the individual falls in the definition of open unemployment by INEGI.[2]

Inactive: if the individual does not participate in the labor market.

Results

The question we want to answer is: Knowing that a worker starts on a period in a given labor category, what is the probability of changing to a different category or staying at the current one at the end of the period? Or, what percentage of workers remained in the same labor category or moved to a different one?

Using the methodology and data previously presented, the transition matrices have been calculated using the panels that start in the third quarter and end in the same one of the following years 1990-1991, 1995-1996 and 2003-2004. Matrices are presented in a general way, separated by men and women, and separated by different age groups in the Appendix.

The results are interpreted technically speaking as probabilities, however, it can be suggested that each cell in the chart represents a per-

[2] *12 year-old and above individuals who during the week when the survey was done did not work any hours per week but were looking for a job or tried to take over an activity on their own.*

centage of workers who moved to another sector or stayed in the same at the end of the period under study. The reason this happens is due to the nature of the employment surveys used, which ask the worker about their labor conditions on the week previous to the interview, which derives in information on the initial and final sector.

Panel Results 2003-2004

Table 3.2 shows the general transitions between labor categories in the 2003-2004 panel.

Table 3.2 Transition Matrix 2003-2004. Men and Women

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	52.96	14.75	1.52	1.82	11.87	1.57	2.37	13.14	100
Formal Employment	9.64	76.04	1.92	0.95	3.18	0.35	2.39	5.53	100
Public Sector	2.22	3.16	87.82	0.47	1.48	0.30	0.84	3.70	100
Employer	8.65	6.27	1.73	44.97	31.24	2.05	0.54	4.54	100
Self-employed	13.81	4.01	1.74	5.66	56.43	2.61	1.01	14.74	100
Without payment	11.95	3.54	1.34	2.32	12.32	38.66	0.73	29.15	100
Unemployed	23.62	21.67	6.22	1.24	9.24	0.53	12.97	24.51	100
Inactive	6.58	3.45	1.36	0.36	5.91	2.34	1.65	78.35	100
Total	15.25	19.13	11.47	3.08	13.86	2.75	1.89	32.56	100

Source: Author's calculations using data of ENET 2003-2004.

The reading of the data in table 3.2 shows that for this period, a worker who started as informal employment in the third quarter in 2003 had a 52.96 percentage probability of remaining in that category. Switching to the right side in the same group, we find that the same worker who started the period in informal employment had a probability of 14.75 percent of ending up as formal employment; a 1.52 percent probability of ending up in the public sector; 1.82 percent probability of ending up as employer; 11.87 as self-employed; 1.57 without payment; 2.37 as unemployed, and 13.14 as inactive.

Workers who started in formal employment had a probability of 76.04 percent of ending up in the same group, followed by a 9.64 probability of moving to informal employment, or to inactive in a 5.53 percent. The lower probability of movement is 0.95 percentage probability of moving toward employer. Workers in the public sector show a higher probability of staying in the same group at the end of the period, with an 87.82

percent, whereas probabilities of moving to different groups are really low. For example, switching to the inactive group is 3.70 percent.

Those who started as employers have only a probability of 44.97 percent of ending up in the same category, followed by 31.24 percent to self-employed, 8.65 to informal employment. Self-employed individuals have a 56.43 percent probability of staying in the same group at the end of the period. Moving to inactive represents 14.74 percent, and informal employment 13.81 percent. On the other hand, those who started without payment have a probability of staying in the same group of 38.66, followed by probability of moving to inactive in 29.15 percent.

For individuals who start as unemployed, the probability of ending up unemployed is 12.97, while the probability of moving to inactive represents 24.51 percent, informal employment in 23.62 percent, formal employment in 21.67 percent. Individuals who started as inactive have a 78.35 probability of staying in this group, followed by a probability of moving to informal employment in 6.58 percent or self-employed in 5.91.Generally speaking, the informal employment group and inactive seem to be the groups with more frequent movements after staying in the same category at the end of the period.

By the analysis of transition matrices by gender, types of movements of men and women can be identified in the different groups, as it is shown in tables 3.3 and 3.4. In table 3.3, men show a higher probability of staying in the initial group if they are in the public sector, with lower movements to other categories. However, for the other groups, being in the informal employment or self-employed category seem to be in general the prevalent second options after the option of staying in the same group.

Table 3.3 Transition Matrix 2003-2004. Men

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	56.76	16.39	1.76	2.47	13.04	1.40	2.83	5.35	100
Formal Employment	10.53	77.84	1.71	1.28	3.86	0.25	2.31	2.21	100
Public Sector	2.94	4.25	86.73	0.85	2.22	0.20	0.92	1.90	100
Employer	9.77	6.68	1.67	46.53	31.75	0.64	0.51	2.44	100
Self-employed	17.22	5.09	1.76	8.24	61.11	1.30	1.30	3.98	100
Without payment	23.75	6.25	0.83	1.67	15.42	33.75	1.67	16.67	100
Unemployed	26.39	23.46	6.45	1.76	12.61	0.88	12.90	15.54	100
Inactive	11.96	6.67	3.07	0.84	5.60	2.38	4.22	65.26	100
Total	21.19	27.49	12.77	5.61	18.27	1.61	2.44	10.63	100

Source: Author's calculations using data of ENET 2003-2004.

Table 3.4 shows the transition matrix for women in the 2003-2004 period. Women show a higher probability of staying in the initial group than men if the initial group is public sector, without payment, unemployed or inactive. Public sector shows the highest probability of permanence, as it happens among men. However, when switching, the first option at the end of the period is being inactive, followed not too close by informal employment.

Table 3.4 Transition Matrix 2003-2004. Women

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	46.38	11.92	1.10	0.69	9.86	1.86	1.59	26.60	100
Formal Employment	7.89	72.49	2.32	0.31	1.83	0.55	2.57	12.04	100
Public Sector	1.46	2.01	88.98	0.07	0.69	0.42	0.76	5.61	100
Employer	2.72	4.08	2.04	36.73	28.57	9.52	0.68	15.65	100
Self-employed	8.59	2.34	1.70	1.70	49.25	4.61	0.57	31.23	100
Without payment	7.07	2.41	1.55	2.59	11.03	40.69	0.34	34.31	100
Unemployed	19.37	18.92	5.86	0.45	4.05	0.00	13.06	38.29	100
Inactive	5.60	2.86	1.05	0.28	5.96	2.34	1.19	80.71	100
Total	10.18	11.97	10.37	0.92	10.08	3.73	1.43	51.32	100

Source: Author's calculations using data of ENET 2003-2004.

It seems like in the case of men, movement are more often in categories where the worker has no access to social security, while for women changes at the end of the period tend towards inactivity.

Transition matrices based on age group are shown in the appendix. For those under age, the most frequent movements are towards informal employment and self-employment. In the group of older workers, inactivity is the most frequent group at the end of the period.

Panel Results 1995-1996

Table 3.5 shows the general transitional matrix using the 1995-1996 panel.

The general trend between changes of category is very similar to that found in panel 2003-2004, being informal employment and inactivity the ones with the most movements.

As read in table 3.6, men show similar trends compared to 2003-2004, since the most probable categories to move to are informal employment

and self-employment.

Table 3.5 Transition Matrix 1995-1996. Men and Women

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	50.27	16.61	2.34	2.29	11.70	1.65	2.98	12.17	100
Formal Employment	10.45	75.53	1.99	1.31	3.33	0.48	2.29	4.62	100
Public Sector	2.69	3.13	86.15	0.79	2.22	0.23	0.85	3.94	100
Employer	8.51	6.18	1.88	49.01	26.52	2.24	1.43	4.21	100
Self-employed	12.49	4.01	1.90	7.47	54.96	2.54	2.05	14.57	100
Without payment	11.61	4.27	1.20	2.41	12.16	37.57	1.42	29.35	100
Unemployed	23.56	17.69	6.17	2.33	9.91	2.33	12.64	25.38	100
Inactive	6.12	3.18	1.31	0.43	5.19	2.39	1.90	79.48	100
Total	13.96	18.38	12.04	3.77	12.66	2.84	2.34	34.00	100

Source: Author's calculations using data of ENEU 1995-1996

Table 3.6 Transition Matrix 1995-1996. Men

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	52.17	17.80	2.23	3.11	14.26	1.77	3.03	5.64	100
Formal Employment	11.34	76.23	1.95	1.65	4.08	0.53	2.27	1.95	100
Public Sector	2.59	3.84	84.76	1.30	3.35	0.22	1.14	2.81	100
Employer	9.09	6.92	1.76	51.03	26.86	0.62	1.55	2.17	100
Self-employed	15.23	5.55	2.00	10.00	59.14	1.50	2.45	4.14	100
Without payment	26.39	5.90	2.78	3.13	15.28	26.39	1.39	18.75	100
Unemployed	28.38	18.27	6.04	3.75	12.23	2.94	13.21	15.17	100
Inactive	10.57	6.23	2.53	1.36	7.26	3.83	4.80	63.42	100
Total	18.97	26.38	13.85	6.96	17.63	1.94	3.01	11.26	100

Source: Author's calculations using data of ENEU 1995-1996

For women in table 3.7 similar trends can be read compared to results in 2003-2004. Most individuals tend to move to inactivity, followed by informal employment.

Table 3.7 Transition Matrix 1995-1996. Women

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	47.00	14.58	2.53	0.87	7.29	1.44	2.89	23.39	100
Formal Employment	8.54	74.06	2.07	0.57	1.76	0.38	2.32	10.30	100
Public Sector	2.80	2.29	87.79	0.19	0.89	0.25	0.51	5.28	100
Employer	4.73	1.35	2.70	35.81	24.32	12.84	0.68	17.57	100
Self-employed	7.74	1.34	1.74	3.08	47.71	4.34	1.34	32.70	100
Without payment	4.80	3.52	0.48	2.08	10.72	42.72	1.44	34.24	100
Unemployed	15.69	16.76	6.38	0.00	6.12	1.33	11.70	42.02	100
Inactive	5.28	2.61	1.08	0.26	4.80	2.13	1.36	82.49	100
Total	9.61	11.42	10.47	0.99	8.34	3.63	1.76	53.79	100

Source: Author's calculations using data of ENEU 1995-1996

Generally speaking, men and women show a higher probability of staying in the public sector, if individuals started in that group at the beginning of the observation, and the chances of moving to another category are really low. Women have a higher probability of staying in the inactive and without payment categories compared to men.

Panel Results 1990-1991

Table 3.8 shows the general transition matrix using the 1990-1991 panel.

Table 3.8 Transition Matrix 1990-1991. Men and Women

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	37.68	25.66	4.47	2.60	11.09	1.62	1.77	15.11	100
Formal Employment	12.12	63.77	4.73	1.90	6.21	0.71	1.35	9.21	100
Public Sector	5.16	13.66	63.43	1.92	4.50	0.56	0.96	9.81	100
Employer	8.46	15.36	6.11	37.30	24.92	1.25	0.47	6.11	100
Self-employed	12.85	13.24	4.62	6.59	43.66	1.63	0.85	16.56	100
Without payment	5.54	5.54	3.38	1.54	9.85	28.31	0.92	44.92	100
Unemployed	19.18	26.48	7.76	1.83	10.96	1.37	7.31	25.11	100
Inactive	5.06	5.85	2.98	0.59	4.43	2.44	1.07	77.58	100
Total	11.42	22.39	10.67	3.22	10.47	2.11	1.23	38.49	100

Source: Author's calculations using data of ENEU 1990-1991

From this evidence, the categories to which most individuals move to at the end of the period are informal employment or inactive. In other periods studied, it was found that informal employment is a category with a high tendency to move to, and here formal employment has a great relevance. This possibly suggests that as from the crisis in the mid nineties, the creation of employment has not been enough to cover the need for this type of job, so activities where workers have no social security have covered this lack of opportunities, generating a difference in the labor dynamics ever since.

We can see in table 3.9 that for men, the category informal employment represents the first movement option within a period, while individuals in informal employment and self-employment represent a second place in number of movements. Public sector has more permanence probability, even though in this case it is lower than the previous periods, after inactivity.

Table 3.9 Transition Matrix 1990-1991. Men

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	39.80	27.55	4.96	3.54	13.67	1.84	1.98	6.66	100
Formal Employment	13.41	65.74	4.95	2.55	7.85	0.42	1.52	3.54	100
Public Sector	7.09	17.06	61.23	3.04	6.67	0.34	0.84	3.72	100
Employer	8.41	16.11	6.30	38.70	26.09	0.70	0.53	3.15	100
Self-employed	14.29	16.30	5.28	8.54	48.45	0.93	1.01	5.20	100
Without payment	16.00	10.00	2.00	1.00	18.00	29.00	3.00	21.00	100
Unemployed	23.08	34.62	7.69	3.08	16.15	0.77	6.15	8.46	100
Inactive	10.28	13.92	5.25	2.25	6.53	3.75	2.89	55.14	100
Total	16.64	34.00	13.22	6.19	16.39	1.48	1.60	10.47	100

Source: Author's calculations using data of ENEU 1990-1991

In the case of women, table 3.10 shows that inactive is the category with more frequent movement, which is consistent with subsequent periods. After this one, formal and informal employment are the options with more movement in the period. Women have a higher probability of staying in the initial sector than men, when in the public sector, unemployed or inactive.

Table 3.10 Transition Matrix 1990-1991. Women

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employed	Without payment	Unemployed	Inactive	Total
Informal Employment	32.91	21.41	3.35	0.48	5.27	1.12	1.28	34.19	100
Formal Employment	8.78	58.68	4.14	0.20	1.97	1.48	0.89	23.87	100
Public Sector	2.27	8.58	66.71	0.25	1.26	0.88	1.13	18.92	100
Employer	8.96	8.96	4.48	25.37	14.93	5.97	0.00	31.34	100
Self-employed	9.03	5.13	2.87	1.44	31.01	3.49	0.41	46.61	100
Without payment	0.89	3.56	4.00	1.78	6.22	28.00	0.00	55.56	100
Unemployed	13.48	14.61	7.87	0.00	3.37	2.25	8.99	49.44	100
Inactive	4.25	4.60	2.63	0.33	4.10	2.23	0.78	81.08	100
Total	6.79	12.09	8.42	0.59	5.23	2.68	0.89	63.31	100

Source: Author's calculations using data of ENEU 1990-1991

Results of the Analysis of Transitions

The percentage of workers who remained in informal employment after five quarters has increased as from the early nineties, moving from 32.91 per cent (39.80) for women (men) at 47 (52.17) per cent in the 1995-1996 period, remaining in 46.38 (56.76) in 2003-2004. Categories where most individuals tend to move are informal employment and inactivity for women and formal employment and/or self-employment/employer for men. Nevertheless, before the crisis, the formal employment category

represented the one with more movement.

The formal employment category has a higher permanence percentage compared to informal employment, however, informality continues as the second option after formality for men, whereas inactivity is the category that takes this place for women. On the other hand, an important percentage of workers move to the informal sector as an alternative to unemployment, for both men and women.

This is certainly not an alarming indicator of the limited opportunities in the labor market regarding formal jobs. Notwithstanding, this transition analysis does not answer other relevant questions: what are the characteristics of workers who remain in the same or move to a different labor category?, how do these movements take place among education and age groups?, what aspects of household influence this dynamics? This is analyzed in the following section, where a multivariable analysis will be applied to the labor dynamics discussed in this section.

Analysis of Formal vs. Informal Sector Choice

The labor dynamics presented in the previous chapter will be analyzed based on worker characteristics (age, education, gender, marital status), characteristics within households (head of household, percentage of member of household over 65, percentage of member of household under 12, another member of the household has social security at work) and their labor background (labor category in the last five quarters). With this data, a multinomial probabilistic model will be used to determine the effect over choosing among the categories presented in the previous section.

Having a dependent variable that changes value according to the category in the labor market and that can be determined by the probability of being in the final sector of a period compared to the other sectors, a Multinominal Logit model shall be used (McFadden, 1974) so that:

$$p_{ij} = e^{x'_{ij}\beta + w'_i\gamma_j} \Big/ \sum_{l=1}^{m} e^{x'_i\beta_l}$$

Where p_{ij} is the probability of i to be working in sector j, β is the set of parameters to be estimated and x is the set of matrices of characteristics to be included in the regressions, such as socio-demographics of workers, among others.

Multinominal logit estimators reflect labor decisions based on the utility an individual obtains after making a decision. These decisions are derived from the hypothesis of maximization of utility. This unit derived from a specific category, which depends on certain characteristics.

In our case, the dependent variable consists of labor categories used in the previous sections: informal employment, formal employment, self-employment, employer, public sector, without payment, unemployed and inactive. Dependent variables are dummies for: age group [18-25, 26-35, 36-45, 46-55 and 56-65]; schooling [no education, incomplete elementary, complete elementary, incomplete middle-school, complete middle-school, incomplete high-school, complete high-school, college]; head of household, married/free union; regions [capital, north, center, south]; if another member of the household is in the informal sector. Additionally, variables regarding household are included: the proportion of individuals under 12 years old of the total in productive-age in household, the proportion of individuals 65 years old or more in productive-age in household. Controls are included for the labor categories where the individual was at the beginning of the period, i.e. the first period of the sample.

Data

Data used in this section comes from the micro-data bases of the *Encuesta Nacional de Empleo Urbano* (ENEU) and *Quarterly* (ENET), and their panels, as it was presented in the previous section.

Results

Results 2004

Table 4.1 shows the results for the Multinomial Logit using 2004 data for individuals who remained in the panel as from the third quarter in 2003

and controls were included for their labor category for the previous year. The base category is formal employment, so coefficients are interpreted as the effect of the variable under study being in a given category compared to the same variable in the formal employment category. The table includes coefficients, standard error in parentheses and the Relative Risk Ratios, RRR, in brackets. RRR can be read as the times it is probable to find a given category in an individual with that characteristic compared to the base labor category, which is formal employment.

An individual who only differs from reference (Formal Employment) in gender (man) finds it 1.13 times more probable to be in the informal employment category. This ratio is higher also in cases where the category is public sector, self-employed and unemployed. The ratio is lower for men in case of employer, without pay and inactive. Married individuals, ceteris paribus, have a higher probability of being in the informal employment than in the formal employment, same as public sector or unemployed. Ratio is higher for employer, self-employed, without pay and inactive, meaning there is a positive relation.

Table 4.1

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Man	.1235582*** (.0632848) [1.131516]	-.232514** (.1059136) [1.131516]	.5621431*** (.1429743) [.7925387]	-.0789312 (.0738958) [1.754428]	-.4838133*** (.123854) [.6164283]	.0687595 (.1099858) [1.071179]	-1.25793*** (.0658946) [.2842418]
Married	-.1788485*** (.0668017) [.8362326]	.1559969 (.1083468) [.8362326]	.4796922*** (.1372577) [1.168823]	.1959639*** (.0750395) [1.615577]	.149328 (.1297121) [1.161054]	-.479972*** (.13183) [.6188007]	.2796715*** (.0687749) [1.322695]
Age							
26-35	-.1118694 (.0767866) [.894161]	.3425026** (.1358072) [1.408468]	1.098712*** (.2286507) [3.0003]	.6721591*** (.1007733) [1.958461]	-.4116796*** (.1474174) [.6625365]	-.2487833* (.13633) [.7797489]	-.3596465*** (.0808787) [.697923]
36-45	1324644 (.0875955) [1.141638]	.6995023*** (.1479042) [2.012751]	1.634863 *** (.2332844) [5.128754]	1.02804*** (.1088006) [2.795581]	.2779048* (.1572801) [1.320361]	-.3352532* (.177218) [.715157]	-.0538705 (.0920139) [.9475548]
46-55	.0231561 (.1051873) [1.023426]	.811314*** (.1700751) [2.250864]	1.656515*** (.2471382) [5.241016]	1.27463*** (.1223251) [3.577379]	.5617314*** (.1834461) [1.753706]	-.118619 (.2113611) [.8881462]	.498897*** (.072018) [1.646904]
56-65	.1860573 (.1440111) [1.204491]	.6749523*** (.2324899) [1.963939]	2.247978 *** (.2733977) [9.468572]	1.747498*** (.1535038) [5.74022]	1.329405*** (.2324432) [3.778796]	-.1410177 (.3159522) [.868474]	1.69721*** (.139493) [5.458699]
Education							
Incomplete Primary	-.369732** (.1772711) [.6909195]	-.4366875 (.3879232) [.6461733]	-.163562 (.2994869) [.8491138]	-.4098096** (.1859243) [.6637766]	-.0518675 (.2819455) [.9494547]	.1176196 (.405738) [1.124816]	-.4608826** (.1823496) [.6307267]

Table 4.1 (continuation)

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Complete Primary	-.6790627*** (.1677779) [.5070921]	-.337150 (.3583721) [.7138012]	-.3348596 (.2873794) [.7154385]	-.6300496*** (.1761844) [.5325654]	-.3209738 (.2694943) [.7254423]	-.4401258 (.3934853) [.6439554]	-.6818371*** (.1718098) [.5056871]
Incomplete Secondary	-.7517217*** (.200614) [.471554]	.0200524 (.4340471) [1.020255]	-.646519* (.3780042) [.5238662]	-.8372321*** (.2210067) [.4329071]	-.8521782** (.3902086) [.426485]	-.005438 (.4416985) [.9945768]	-.9113593*** (.214427) [.4019775]
CompleteSecondary	1.101128*** (.1669471) [.3324958]	-.18812 (.3503058) [.8285152]	-.5779925** (.2909869) [.5610235]	-.9312454*** (.1764938) [.3940626]	-.6616562** (.2737207) [.515996]	-.4393083 (.383215) [.644482]	-1.081792*** (.1715066) [.3389874]
Incomplete Upper Seconday	-1.29602*** (.1924824) [.2736185]	.329277 (.835158) [1.389963]	-.6529882** (.3592899) [.5204881]	-1.102891*** (.131306) [.33191]	-.6478195** (.2131306) [.5231853]	-.178383 (.4089715) [.836622]	-1.036343 (.1973039) [.3547495]
Complete Upper Secondary	-1.380219*** (.1725902) [.2515235]	.5831264 (.3483814) [1.791631]	-.3988183 (.2983068) [.6711126]	-1.160119*** (.1828231) [.313449]	-.6992395** (.2773919) [.4969631]	-.4015135 (.3868643) [.6693063][	-1.120307*** (.1748244) 3261797]
College degree	-1.439456*** (.1705893) [.2370567]	1.142926* (.3432555) [3.135931]	.1926313 (.2843266) [1.212436]	-1.146978*** (.1802991) [.317595]	-.7620834*** (.2781357) [.4666931]	.1965438 (.3762262) [1.217189]	-1.027446*** (.1730049) [.3579197]
Labor category previous year							
Informal Employment	3.160829*** (.0693153) [23.59014]	1.562321*** (.1740637) [4.769881]	2.385948*** (.1970453) [10.86936]	2.882188*** (.1049738) [17.85329]	2.902877*** (.279157) [18.2265]	1.508603*** (.1488968) [4.520411]	2.343755*** (.0916393) [10.42029]
Public Sector	1.771718*** (.1697315) [5.880947]	6.705229*** .1503777) [816.6653]	2.217043*** (.3248958) [9.18015]	2.289527*** (.2022247) [9.870272]	2.959607*** (.4296024) [19.2904]	2.183148*** (.2469714) [8.874194]	2.687454*** (.1607584) [14.69422]
Employer	2.4203*** (.1810024) [11.24924]	2.200259*** (.3043855) [9.027355]	5.950851*** (.2066178) [384.0799]	4.610838*** (.1680658) [100.5684]	4.575318*** (.3670471) [97.0589]	1.140155 ** (.4782778) [3.127254]	2.532994*** (.2184972) [12.59115]

Table 4.1 (continuation)
Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Self-Employed	3.168421*** (.1082537) [23.76993]	2.835144*** (.1869111) [17.03285]	4.519227 *** (.1861279) [91.76461]	5.546004*** (.1202551) [256.2116]	4.774825*** (.2805938) [118.4896]	2.183407*** (.2116457) [8.876495]	3.690996*** (.1186653) [40.08473]
Without payment	3.176886*** (.2197094) [23.97198]	2.610251 *** (.3735604) [13.60247]	4.352711 *** (.3405058) [77.68882]	4.490301*** (.2308433) [89.14828]	6.979993 *** (.3141721) [1074.911]	1.530828*** (.4617627) [4.622003]	4.105723*** (.2113926) [60.68661]
Unemployed	2.174583*** (.1378685) [8.798518]	2.389586 *** (.2234844) [10.90898]	1.832642 *** (.4208708) [6.250381]	2.603837*** (.1893378) [13.5155]	.517511** (.35057) [4.560857]	2.574778*** (.1801676) [13.1284]	2.756072*** (.1459951) [15.73791]
Inactive	2.653449*** (.0919166) [14.20294]	2.680063*** (.1587108) [14.58601]	2.52155*** (.2500473) [12.44788]	3.674983*** (.1164468) [39.44798]	4.241957*** (.2006571) [69.5438]	2.423985*** (.1463325) [11.29077]	4.990086*** (.0896634) [146.949]
Household							
Head	-.2107779*** (.0736071) [.8099539]	-.2495684** (.1202173) [.779137]	-.0929447 (.1476269) [.9112438]	-.166108** (.0823218) [.8469548]	-2.228866*** (.1885292) [.1076504]	-.3938235*** (.1492315) [.6744731]	-1.045635*** (.0803677) [.3514684]
% members over 65	-.0135706 (.3224408) [.9865211]	.2107735 (.4914487) [1.234633]	-1.143406 (.7885924) [.3187314]	.3368437 (.3589111) [1.40052]	-.4905436 (.5334553) [.6122935]	.4808828 (.5152431) [1.617502]	-.2210511 (.325352) [.8016757]
% members under 12	.4947565*** (1251027) [1.640099]	.0292068 (.2051505) [1.029638]	.0069353 (.2146133) [1.006959]	.3008946** (.1383974) [1.351067]	.1378865 (.2392527) [1.147845]	.1637335 (.265096) [1.1779]	.2765628** (.1330035) [1.31859]
Another household member with social security	-.2489609*** (.0694183) [.7796104]	-.0824195 (.1149966) [.9208856]	-.6236342*** (.1596813) [.535993]	-.3550128*** (.08292) [.7011645]	-.6621545*** (.143132) [.515739]	-.0767638 (.1184458) [.9261086]	-.0766255 (.0694773) [.9262367]
Constant	-.6581702*** (.2006571)	-4.502194*** (.4067386)	-6.159899*** (.4246546)	-2.993007*** (.2325962)	4.058183*** (.4147722)	-2.258856*** (.4231077)	-.8332486*** (.2086273)

Table 4.1 (continuation)

Multinominal logit 2003-2004

Region	Informal employment	**Public sector**	**Employer**	**Self-employed**	**Without pay**	**Unemployed**	**Inactive**
North	-.5013145***	.0653421	-.0909832	-.2445535**	.1520279	-.56058***	-.1196453
	(.0978262)	(.1661823)	(.1934615)	(.112079)	(.1963018)	(.1624596)	(.1026503)
	[.6057339]	[1.067524]	[.913033]	[.7830541]	[1.164193]	[.5708779]	[.8872351]
Center	-.1364405	.1370532	.3636801**	-.0122647	.1895284	-.4672034 ***	-.025535
	(.0976821)	.1678939)	(.1922111)	(.1123815)	(.1960359)	(.1643211)	(.1033873)
	[.8724582]	[1.146889]	[1.438614]	[.9878102]	[1.208679]	[.6267526]	[.9747882]
South	.0193145	.5210719***	.411917 **	.2739427**	.7062672***	-.5005121**	.197131*
	(.1108338)	(.183623)	(.2122752)	(.1255882)	(.2096087)	(.1980618)	(.1166717)
	[1.019502]	[1.683832]	[1.509709]	[1.315139]	[2.026413]	[.6062202]	[1.217904]
N	26407						
Log likelihood	-26291.748						
Pseudo R2	0.4377						

Note: Standard errors in parentheses, RRR in brackets. ***, ** and * denote significance at 1, 5 and 10% respectively. Base total category is formal employment. base categories: women, 18-25 years old, no education, capital.

For age groups, it can be observed that there is a general trend to increase probabilities as the worker gets older, with important variations though. Age groups are not significant in the informal employment category. Within public sector, the [RRR] ratio increase with age groups, but tend to decrease in the older group. For employer and self-employed categories, the ratio of age groups increases faster than other categories. In the category without payment, younger groups have a lower probability of being in that sector than informal employment, but this increases with age. For unemployed, the ratios are lower than one, which means there is a negative relation, additional to the fact that they are only significant to younger groups. For the inactive group, the ratio is higher than one in older groups, so it is probable to fall in this group as the person ages, rather than being in the formal employment, which is the case for younger workers.

Regarding education groups, we find important variations in categories and levels. For instance, an individual in informal employment has less probabilities of being in this section having more education than in the formal employment category. For public sector, the education levels are not significant. For the employer category, education is only significative in mid levels, while in the case of self-employed it is lower than one and decreasing. For those in without payment, the lowest education levels are not significant and all of them are below one. For the unemployed education is not significant, and for the inactive it is decreasing and lower than one.

Also in table 4.1, we present the results for the category in which the individual was in the previous year. In all cases, being in the same category the year before gives a higher probability of being in the given category. The second category with more probability after the one under study is usually self-employment. This indicates this category has a higher dynamism and it is easier to move to any other category from there.

Within variables that correspond to households, head of household has a negative relation in all cases, which indicates that being head of the household represents less probabilities of being in any other category different from formal employment. The proportion of over 65 compared to those in productive age within the household is not significant in any case.

For the variable that considers under 12s in the proportion of productive age in the household, it is significant and positive only in the cases of informal employment, self-employment and inactive, so there are more probabilities of being in those categories than in formal employment if there is a higher proportion of individuals under 12 in the household. The variable that considers if another member of the household has social security derived from work is always negative, although it is not significant in the public sector, unemployed and inactive categories. This is, an individual has less probabilities of being in the informal employment, employer, self-employment or without pay categories than as in formal employment if someone else in the household has social security at work.

Regarding controls per region, the central region is only significant in increasing probabilities of being employer and reduce being unemployed, while in the north it is significant in reducing the probabilities of being in informal employment, self-employed or unemployed. The south region has a significant influence in increasing the probabilities of working in the public sector, being employer, self-employed, without payment or inactive, while it reduces the probability of being unemployed.

Results 1996

Table 4.2 shows the results for the third quarter 1996, using only individuals observed in the five previous quarters.

Results are very similar in trends to those obtained for the 2003-2004 period. The only age group that shows positive significance in all categories is the one for 56 to 65 years old, which means the older group has more probabilities than the younger workers of being in any category before formal employment. This trend occurs in an increasing way as moving along age groups, except for the unemployed group, where only the oldest group is significant.

Trends in the effects of education level are similar to those in 2003-2004. While all education groups are significant and negative for the informal employment category, which means the more education the lower is the probability of being in the informal employment group instead of

the formal one. For the public sector, there is a positive significant relation for the two groups with higher education. In the case of employers, there is a U shape relation, but only significant for the mid groups. For self-employed, it is rather decreasing, but only significant in mid levels. As for unemployed and inactive, the relation decreases in a faster rate in the lower levels of education.

Table 4.2

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
	.13403**	-.2493554***	.7920747***	.1699946**	-.0667076	1648315	-.9394299***
Man	(.0641922)	(.1031152)	(.1355725)	(.075975)	(.1235706)	(.1052591)	(.0680743)
	[1.143431]	[.779303]	[2.207972]	[1.185298]	[.9354687]	[1.179194]	[.3908506]
	-.2309129***	.1063348***	.3496961***	.0691782	.3100591***	-.4447951***	.3975055***
Married	(.0653545)	(.1001353)	(.1238861)	(.0731601)	(.1209743)	(.1139979)	(.066736)
	[.7938086]	[1.112194]	[1.418636]	[1.071627]	[1.363506]	[.6409556]	[1.488108]
Age							
	-.0027778	.4219397***	1.429459***	.8580667***	.0166911	-.0064051	.0132522
26-35	(.0724234)	(.1174755)	(.186258)	(.0921129)	(.1351575)	(.1247225)	(.0775561)
	[.9972261]	[1.524917]	[4.176438]	[2.358596]	[1.016831]	[.9936154]	[1.01334]
	.1093551	.8469724***	1.919877***	1.231443***	.4162749***	.2001683	.3546639***
36-45	(.0855584)	(.132261)	(.1957536)	(.1023956)	(.1528015)	(.1526348)	(.0898622)
	[1.115558]	[2.332574]	[6.820121]	[3.42617]	[1.516303]	[1.221608]	[1.425701]
	.1023999	.8938785***	2.432474***	1.466706***	1.00456***	.3027238	1.027045***
46-55	(.1092043)	(.1600287)	(.2106202)	(.1210324)	(.1810748)	(.1937034)	(.1097381)
	[1.107826]	[2.444593]	[11.38701]	[4.334932]	[2.730706]	[1.353541]	[2.7928]
	.3379784**	1.060758***	2.656349***	1.935741***	2.097706***	.4764521*	2.115947***
56-65	(.1504771)	(.221087)	(.2445203)	(.1556116)	(.2176124)	(.2630868)	(.1450753)
	[1.40211]	[2.88856]	[14.24419]	[6.929176]	[8.147461]	[1.610351]	[8.297438]
Education							
	-.523567***	-.2503935	-.3548177	-.4062075**	-.1979232	-.3906169	-.4822626***
Incomplete Primary	(.1687234)	(.327269)	(.2535207)	(.1756248)	(.257252)	(.2860994)	(.1723505)
	[.5924037]	[.7784944]	[.7013013]	[.6661719]	[.8204329]	[.6766393]	[.6173849]

Table 4.2 (continuation)

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Complete Primary	-.840885***	-.0243154	-.4504748*	-.6773404***	-.3942854	-.7773852***	-.8022474***
	(.1615412)	(.3089737)	(.2434301)	(.1688155)	(.2466515)	(.2758062)	(.1651849)
	[.4313286]	[.9759778]	[.6373255]	[.5079662]	[.6741616]	[.4596062]	[.4483203]
Incomplete Secondary	-.8996849***	.0449586	-.6253745**	-.7960135***	-.8448205***	-.6067105*	-.9443374***
	(.1847673)	(.3522767)	(.3139048)	(.2021691)	(.326978)	(.3176012)	(.1966189)
	[.4066978]	[1.045985]	[.535061]	[.4511238]	[.4296345]	[.5451412]	[.3889372]
Complete Secondary	-1.251588***	.1192254	-.3740375	-.919085***	-.5105518**	-.6746635**	-1.086925***
	(.1643701)	(.3101343)	(.2523581)	(.1735481)	(.2517194)	(.2747439)	(.1683068)
	[.2860501]	[1.126624]	[.6879511]	[.3988838]	[.6001643]	[.5093278]	[.337252]
Incomplete Upper Secondary	-1.420595***	.4999741	-.0063101	-1.130225***	-.3078927	-.5106979*	-.824297***
	(.1857385)	(.3336024)	(.2879705)	(.2050444)	(.2857861)	(.2983714)	(.1882995)
	[.2415701]	[1.648679]	[.9937097]	[.3229604]	[.7349942]	[.6000767]	[.4385432]
Complete Upper Secondary	-1.424967***	.5353066*	-.1739471	-1.109943***	-.694674***	-.6009115**	-.9882492***
	(.1684653)	(.3091443)	(.2582667)	(.1796176)	(.2597627)	(.2774897)	(.1705631)
	[.2405165]	[1.707972]	[.8403413]	[.3295776]	[.4992372]	[.5483116]	[.3722278]
College degree	-1.452148***	.9296877***	.2601547	-1.069073***	-.6847272***	-.6623648**	-.9908084***
	(.1659877)	(.304524)	(.243364)	(.1748991)	(.258209)	(.2736743)	(.1687471)
	[.234067]	[2.533718]	[1.297131]	[.3433267]	[.5042278]	[.5156305]	[.3712764]
Labor category previous year							
Informal Employment	2.926175***	1.73942***	2.197798***	2.745609***	2.507645***	1.693734***	2.330342***
	(.0669322)	(.1543922)	(.1714247)	(.1027163)	(.2457423)	(.1409376)	(.0955303)
	[18.65614]	[5.69404]	[9.005166]	[15.5741]	[12.27599]	[5.439757]	[10.28146]
Public Sector	1.934641***	6.728015***	2.441038***	2.742292***	2.347588***	2.218578***	2.863074***
	(.1510443)	(.1429209)	(.251067)	(.1714905)	(.4230985)	(.23129)	(.1518417)
	[6.921556]	[835.4868]	[11.48496]	[15.52252]	[10.46031]	[9.194248]	[17.51529]

Table 4.2 (continuation)

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Employer	2.372053***	2.250209***	5.616081***	4.37283****	4.273258***	2.14915***	2.495029***
	(.167539)	(.2716477)	(.1802121)	(.1581038)	(.3156596)	(.2964243)	(.2088918)
	[10.71938]	[9.489718]	[274.8102]	[79.26761]	[71.75505]	[8.577569]	[12.12209]
Self-employment	2.977643***	2.897158***	4.524843***	5.49082***	4.332364***	2.846125***	3.75444***
	(.1094113)	(.1819474)	(.164623)	(.1195404)	(.2492398)	(.1758146)	(.1222085)
	[19.64147]	[18.12256]	[92.28145]	[242.4558]	[76.12401]	[17.22091]	[42.71029]
Without payment	2.844849***	2.348123***	4.086159***	4.356376***	6.495209***	2.199857***	4.118135***
	(.1960622)	(.3599089)	(.3045688)	(.2081808)	(.26919)	(.3373788)	(.1891782)
	[17.19897]	[10.46591]	[59.51088]	[77.97401]	[661.9623]	[9.02372]	[61.44454]
Unemployed	2.160395***	2.679134***	2.339923***	2.716213***	2.84597***	2.995811***	3.139553***
	(.1129135)	(.1836577)	(.2592491)	(.1527924)	(.3045455)	(.1527488)	(.1245092)
	[8.67456]	[14.57246]	[10.38044]	[15.12295]	[17.21826]	[20.00158]	[23.09355]
Inactive	2.54007***	2.686553***	2.626683***	3.684491***	4.016097***	2.813168***	5.227348***
	(.0888057)	(.1525367)	(.2132109)	(.1139906)	(.2259405)	(.1392017)	(.0921762)
	[12.68055]	[14.68098]	[13.82783]	[39.82484]	[55.48413]	[16.66261]	[186.2981]
Household							
Head	-.3316258***	-.2406196**	-.2070892	-.2497451***	-2.313558***	-.4808396***	-1.144358***
	(.0755677)	(.1166083)	(.1396738)	(.0843404)	(.1776901)	(.1356735)	(.0835412)
	[.7177559]	[.7861406]	[.8129471]	[.7789994]	[.0989087]	[.6182641]	[.3184284]
% members over 65	-.1044743	.6022129	-.7416206	-.0515407	-.9044664*	-.1963177	-.2827827
	(.3004036)	(.4240661)	(.5962135)	(.3375906)	(.5190615)	(.4938199)	(.3004301)
	[9007979]	[1.826155]	[.4763413]	[.949765]	[.4047578]	[.8217511]	[.7536836]
% members under 12	2839528*	.0994479	.1792917	.114916	-.4308198	.2829398	-1.403192***
	(.1440132)	(.2297827)	(.2081896)	(.160593)	(.4132936)	(.2726587)	(.2222686)
	[1.32837]	[1.104561]	[1.19637]	[1.121779]	[.649976]	[1.327025]	[.2458111]

Table 4.2 (continuation)

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Other household member with social security	-.1878342***	-.0379039	-.4396223***	-.2832602***	-.6477687***	-.0392121	-.0028778
	(.0641143)	(.0999674)	(.1285255)	(.0764245)	(.1247902)	(.1031109)	(.0650394)
	[.8287521]	[.9628055]	[.6442797]	[.7533238]	[.5232119]	[.9615468]	[.9971263]
Region							
North	-.6217885***	-.7098925***	-.3764503**	-.5340874***	-.7318735***	-.7068661***	-.5432213***
	(.0963604)	(.369016)	(.1609711)	(.1097171)	(.1696883)	(.139721)	(.0985616)
	[.5369832]	[.491697]	[.6862932]	[.586204]	[.481007]	[.4931874]	[.5808741]
Center	-.0310773	-.2424715*	-.0820108	-.1065424	-.013777	-.7066445***	-.1708571*
	(.0973175)	(.1397897)	(.1639488)	(.1112938)	(.1678595)	(.147078)	(.1007752)
	[.9694006]	[.7846861]	[.921262]	[.8989369]	[.9863175]	[.4932967]	[.842942]
South	.0223578	-.094687	.1157697	.029627	-.1584163	-.7837036***	-.1234661
	(.1125955)	(.1607088)	(.1868429)	(.1278212)	(.1958723)	(.1868602)	(.1171935)
	[1.02261]	[.9096576]	[1.122737]	[1.03007]	[.8534944]	[.4567114]	[.8838516]
Constant	-.3934485***	-3.890569	-5.901321	-2.868874	-3.575164	-1.970607	-1.045939
	(.1940161)	(.3552203)	(.3587275)	(.2238289)	(.3642692)	(8.3193717)	(8.2038087)

N 28686
Log likelihood -28995.727
Pseudo R2 0.4322

Note: Standard errors in parentheses, RRR in brackets. ***, ** and * denote significance at 1, 5 and 10% respectively. Base total category is formal employment. base categories:: women, 18-25 years old, no education, capital.

Within the categories individuals were five quarters back, the same category where they currently are has a higher effect on the probability of being in any category different from the reference, except informal employment, where the main effect comes from being self-employed before. The second most important effect usually comes from being in the self-employed group, and before that one the category "without payment". Self-employment is the category that introduces a noticeable dynamics in the other categories, having a positive significant effect on the probability of being in other categories rather than formal employment.

In categories regarding household, being head of the household reduced the probability of being in other categories different from formal employment. For the ratio of over 65 to members in a productive age, no significant effect can be established over probabilities, except for those without payment, where the probability of being in that category is reduced compared to formal employment. For the ratio of members of the household under 12 to those in a productive age, this is only positive and significant for the informal employment group, but negative for the inactive one. Having another member of the household with social security from work decreases the probability of being in the informal employment, employer, self-employed and without pay categories compared to formal employment. This means that if someone else in the household has social security at work, it is more probable that the individual is in the formal employment category.

For regional controls, it was found that the north region reduces in a significant way the probability of being in any category compared to the formal sector. The central region reduces the probability of being in the public sector, unemployed or inactive, while the south is only significant in reducing the probability of unemployment.

Results 1991

Table 4.3 shows the result for the third quarter in 1991 with individuals who were observed since the third quarter in 1990.

Being a man reduces the probability of being in the public sector

compared to women and the formal employment category. For other categories, the probability of being in a different sector compared to formal employment increases. Being married or in free union reduces the chances of being in the informal employment and unemployed groups compared to formal employment.

Table 4.3

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
	0.1437*	-0.3712***	1.03575***	.3013679***	.1258618	.1481047	-1.198245***
Man	(.0798)	(0.0993)	(0.2010)	(.0962275)	(.1703257)	(.1764722)	(.0758059))
	[1.154]	[0.6898]	[2.8172]	[1.351707]	[1.134125]	[1.159634]	[.3017232]
	-0.1333*	0.1399 ***	0.3828**	.2197091**	.1955833	-.4153888**	.5340878***
Married	(.0797)	(0.0945)	(0.1632)	(.0873313)	(.166544)	(.2026015)	(.0714524)
	[.8751]	[1.1502]	[1.4664]	[1.245714]	[1.21602]	[.6600836]	[1.705891]
Age							
	0.0061	0.4297***	1.4360***	.6523519***	-.1100319	-.243319	-.0714288
26-35	(.0857)	(0.1083)	(0.2447)	(.1099868)	(.1745224)	(.2053572)	(.0821747)
	[1.0064]	[1.5368]	[4.2039]	[1.920051]	[.8958056]	[.7840214]	[.9310625]
	0.1077	0.8256***	1.9156***	1.012973***	.5358198***	-.6521551**	.3243943***
36-45	(0.1034)	(0.1242)	(0.2564)	(.1217635)	(.202564)	(.310843)	(.0975099)
	[1.1137]	[2.2834]	[6.7914]	[2.753777]	[1.708849]	[.5209219]	[1.383193]
	0.1959	1.0363***	2.2764***	1.153271***	1.164912***	-.0279133	1.173337***
46-55	(0.1278)	(0.1515)	(0.2707)	(.1404527)	(.2462759)	(.3481833)	(.1194848)
	[1.2164]	[2.8189]	[9.7420]	[3.16854]	[3.205641]	[.9724727]	[3.232764]
	0.2810*	0.9581***	2.4751***	1.487235***	2.145638***	-.1243548	2.102426***
56-65	(0.1686)	(0.2104)	(0.3059)	(.1706247)	(.2988511)	(.4916216)	(.1488007)
	[1.3245]	[2.6069]	[11.8837]	[4.424843]	[8.547489]	[.8830665]	[8.186007]
Education							
	-0.3348**	0.4070	-0.1926	-.424104**	-.3239114	-.3394435	-.260642
Incomplete Primary	(0.1659)	(0.2977)	(0.3172)	(.1669511)	(.3165842)	(.4572393)	(.1615828)
	[0.7154]	[1.5023]	[0.8247]	[.6543558]	[.7233143]	[.7121666]	[.7705567]

Table 4.3 (continuation)

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Complete Primary	-0.5970*** (0.1612) [.550409]	0.321216 (0.28871) [1.3788]	0.0602 (0.3063) [1.0620]	-.6245539*** (.1627935) [.5355003]	-.2899847 (.3039101) [.748275]	-.8930429** (.4511611) [.409408]	-.4071885*** (.1566505) [.6655188]
Incomplete Secondary	-0.6051*** (0.1963) [0.5460]	.798427** (0.32213) [2.2220]	0.3127 (0.3726) [1.3671]	-.7352079*** (.2108914) [.4794058]	-.1540917 (.3971959) [.8571934]	-.2695767 (.5049765) [.7637027]	-.3279083* (.1985577) [.720429]
Complete Secondary	-0.8943*** (0.1676) [0.4088]	0.5219* (0.2915) [1.6852]	0.1435 (0.3193) [1.1543]	-.903601*** (.172674) [.4051082]	-.5701557* (.3182133) [.5654374]	-.818931* (.4484815) [.4409027]	-.6819047*** (.1622482) [.505653]
Incomplete Upper Secondary	-0.8118*** (0.1893) [0.4440]	0.6033* (0.3117) [1.8282]	-0.1264 (0.3759) [0.8812]	-1.078198*** (.2100542) [.3402079]	-.2962451 (.355739) [.7436051]	-.4860207 (.4712742) [.6150691]	-.4078772** (.182624) [.6650605]
Complete Upper Secondary	-1.0712*** (0.1758) [0.3425]	0.8335*** (0.2915) [2.3015]	0.4388 (0.3265) [1.5509]	-.9934341*** (.1825335) [.3703029]	-.4119593 (.3215768) [.6623512]	-.5320881 (.4481725) [.5873772]	-.5769278*** (.1648429) [.5616211]
College degree	-0.9115*** (0.1721) [0.4019]	1.0383*** (0.2892) [2.8244]	0.9375*** (0.3096) [2.5537]	-.9926435*** (.1786203) [.370595]	-.5148065 (.332576) [.5976162]	-.4591702 (.4443953) [.6318077]	-.4272589*** (.16633) [.6522947]
Labor category previous year							
Informal Employment	1.8888*** (0.0776) [6.6116]	0.8798*** (0.1396) [2.4104]	1.3094*** (0.1905) [3.7041]	1.455812*** (.1078687) [4.287965]	1.379322*** (.2598976) [3.972206]	1.006191*** (.2275091) [2.735163]	1.244502*** (.0981333) [3.471207]
Public Sector	0.7609*** (0.1293) [2.1402]	3.8907*** (0.1058) [48.9466]	1.1809*** (0.2149) [3.2576]	1.22727*** (.1436612) [3.411903]	1.074132*** (3675579) [2.927451]	1.241172*** (.2830378) [3.459667]	1.365473*** (.1192611) [3.917576]

Table 4.3 (continuation)

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
	1.0782***	1.5143***	3.8164***	2.540719***	2.490773***	.7742863	1.179639***
Employer	(0.1798)	(0.2082)	(0.1737)	(.1495935)	(.4332993)	(.6111054)	(.2121529)
	[2.9395]	[4.5464]	[45.4404]	[12.68879]	[12.07061]	[2.169044]	[3.2532]
	1.5315***	1.4803***	2.5553***	3.265903***	2.213625***	1.262527***	1.936095***
Self-Employment	(0.1076)	(0.1525)	(0.1673)	(.1036439)	(.2810443)	(.3083453)	(.1147464)
	[4.6254]	[4.3944]	[12.8754]	[26.20375]	[9.148825]	[3.534343]	[6.931627]
	1.4229***	2.0173***	2.8045***	3.019291***	4.817182***	1.505483**	3.059394***
Without payment	(0.3230)	(0.3779)	(0.5299)	(2989903)	(.315237)	(.6412422)	(.2545801)
	[4.1492]	[7.5182]	[16.519]	[20.47677]	[123.6162]	[4.506329]	[21.31463]
	1.2604***	1.4507***	1.3722**	1.721074***	.986087	2.135449***	1.769354***
Unemployed	(0.2112)	(0.2897)	(0.5389)	(.2584943)	(.6253818)	(.3238812)	(.2073573)
	[3.5268]	[4.2661]	[3.9441]	[5.590529]	[2.680724]	[8.460843]	[5.867062]
	1.3601***	1.7000***	1.7074***	2.074775***	2.471455***	1.83125***	3.32846***
Inactive	(0.0961)	(0.1238)	(0.2224)	(.1139817)	(.2165449)	(.2030375)	(.0819341)
	[3.8969]	[5.4742]	[5.5149]	[7.962755]	[11.83967]	[6.241684]	[27.89535]
Household							
	-0.3819***	-0.3247***	-0.0998***	-.2553925**	-3.9367***	-.6950763***	-1.411064***
Head	(0.0940)	(0.1131)	(0.1980)	(.1041497)	(.365084)	(.2543271)	(.0956443)
	[0.6825]	[0.7227]	[0.9049]	[.7746124]	[.0195112]	[.4990364]	[.2438838]
	-0.3654	-0.2357 -	-0.5175	.2868503	.1331704	.1711459	-1.01434***
% members over 65	(0.3724)	(0.4187)	(0.7856)	(.3948603)	(.5571117)	(.76592)	(.326732)
	[0.6938]	[0.7899]	[0.5959]	[1.332225]	[1.142445]	[1.186664]	[.3626418]
	0.0443	0.2352	-0.4466*	-.1446657	-1.225626*	-.0172049	-1.805081***
% members under 12	(0.1585)	(0.1943)	(0.2373)	(.1662225)	(.6546017)	(.4735507)	(.2539623)
	[1.0453]	[1.2652]	[0.6397]	[.8653115]	[.2935738]	[.9829422]	[.1644611]

Table 4.3 (continuation)

Multinominal logit 2003-2004

	Informal employment	Public sector	Employer	Self-employed	Without pay	Unemployed	Inactive
Other household member with social security	-0.1537 ** (0.0734) [0.8575]	0.02428 (0.0906) [1.0245]	-0.4573*** (0.1591) [0.6329]	-.2480091*** (.086043) [.7803529]	-.8686557*** (.1664659) [.4195151]	-.0334274 (.1643094) [.9671251]	-.0681552 (.0675147) [.9341155]
Region							
North	-0.4487*** (0.0850) [0.6384]	-0.3315*** (0.0987) [0.7177]	-0.0081 (0.1584) [0.9919]	-.0263147 (.0976682) [.9740285]	-.1801128 (.1777045) [.835176]	-.7479724*** (.176455) [.4733253]	-.0148476 (.0822358) [.9852621]
Center	-0.1894** (0.0887) [0.8274]	-0.3402*** (0.1063) [0.7115]	0.1991 (0.1654) [1.2202]	-.0809166 (.1034577) [.9222706]	.1674171 (.1786376) [1.182247]	-.8630641*** (.1984443) [.4218674]	-.0639922 (.0874035) [.9380123]
South	-0.3449** (0.1741) [0.7082]	-0.0960 (0.1963) [0.9084]	0.0026 (0.3005) [1.0026]	.3361919* (.175931) [1.399608]	-.7167932* (.4330151) [.4883157]	-1.971587*** (.7289221) [.1392357]	-.068849 (.1610439) [.9334676]
Constant	-0.4380** (0.1915)	-3.0889*** (0.3166)	-6.2088*** (0.4352)	-2.370671*** (.2150601)	-2.944919 (.3960712)	-2.0045*** (.4833585)	-.5127131*** (.1852814)

N 17826.000
Log likelihood -20111.006
Pseudo R^2 0.3234

Note: Standard errors in parentheses, RRR in brackets. ***, ** and * denote significance at 1, 5 and 10% respectively. Base category is formal employment. base categories: women, 18-25 years old, no education, capital.

Education levels generally reduce the probability of being in a category different from formal employment, as the individual moves on in those levels. The exception is found in the public sector, where the more educated increases the probability of being in this category compared to formal employment. However, for the employer category, education levels are not significant in the highest, while for the group without payment only complete mid-school is significant, and for the case of unemployed complete elementary and mid-school are significant.

As for the position of the previous year observed in 1992, the main effect in all categories comes from the category where the individual was the previous year. However, different from the previously analyzed years, the main dynamics comes from the category without payment, while the same dynamics are introduced by the self-employment category for the years 1996 y 2004.

Being head of household reduces the chances of being in a category different from formal employment. The variable of the ratio of individuals over 65 to those in a productive age in the household is only significant for the inactive group, where the probability of being in this sector compared to formal employment is reduced. The variable of the ratio of under 12 to those in a productive age is only significant for the categories without payment and inactive, where the probability of being in those sectors is reduced compared to formal employment. The variable of other members of the household with social security from work is significant for the informal employment, employer, self-employed and without payment groups, where the probability of being in those categories compared to formal employment is reduced.

Variable for the north region is only significative to reduce the probability of being in the informal employment, public sector and unemployed categories. The center variable is only significative to reduce the probability in the informal employment, public sector and unemployed categories. The southern region variable is significative to reduce the probabilities of informal employment and unemployment.

General Findings

From the two analyses in this section, we can get two important conclusions. First, there seems to be a change in the labor dynamics around 1994/95. Before those years, it seems like the labor dynamics came from the workers in the category without payment. After that period, the main source of dynamics among sectors comes from the self-employment category.

Age has an important role on the decision to join different labor categories. As we move forward in age groups, there is less probability of being in the formal employment sector generally. This has implications on the future of retirement programs. For instance, it was found that the younger workers have a higher probability of being in the formal employment category, but as they grow older they change to a job that has no social security, so they probably will not meet the requirements to rate and access a retirement in the future. We can also observe the incentives that younger workers have to increase their human capital if future perspectives do not look promising. As for education levels, the higher education is, the more probable it is to find the worker in the formal employment or public sector categories.

In the variables regarding household, there is no big relevance as for the number of individuals over 65, although there is evidence regarding those under 12 in the household reducing the probability of being in the formal sector. Nevertheless, we noticed a strong effect in cases where another member of the household has social security to have a higher probability of being in a formal job, which is congruent with other studies done for Latinamerica (See for instance Auerbach, Genoni and Pagés, 2005). This indicates a possible use of the social household networks to have more information on the labor market, since there it is possible to find a high quest for some given employments through relatives, and results in something productive. It has been documented that those individuals who are looking for a job through relatives usually get higher job offers than those who use different sources of information (see Calvó and Ionnannis, 2005).

Having analyzed all characteristics of workers within the labor dynamics, it is important to wonder if those wage rewards between formal and informal workers [the different labor categories used in this book]

are relevant to consider that could be more attractive in the categories used.

Wage Premia and Income Levels

In this section, we develop a quantile regression, or a regression by level of income on the wage logarithm per hour based on a number of factors. The use of this type of analysis by quantiles allows us to learn how wage premia vary to education, and to the other labor categories that are used as part of this work in regards to a specific income level of the employee. This means we can learn about the wage premia received by a worker in informal employment based on a set of characteristics, whether the individual earns a low, medium or high income.

Koenker and Bassett (1978) proposed this type of regressions given the fact that the Ordinary Least Squares (OLS) are based only on the measure of the conditional distribution of the dependent variable. Quantiles allow us to learn the effects of the independent variables on the conditioned distribution, together with the media (Koenker, 2005).

Quantile Regression

A regression of the OLS is based on the mean of the conditional distribution of the dependent variable used in the analysis. This proxy assumes that possible differences in terms of the impact of the exogenous variables together with the conditional distribution are important.

Nevertheless, this could mean insufficiencies in some research agendas. If exogenous variables influence parameters of the conditional distribution of the dependent variables in others more than the mean, then an analysis that ignores this possibility would be seriously weakened. (See Koenker and Bassett 1978). Unlike OLS, the regression models by quantiles allow a wide characterization of the conditional distributions of the dependent variable.[3]

[3] *See Abadie et al. (2002) for a recent extention on quantile regressions, considering instrumental variables.*

Given a wages equation, the regression model by quantiles could be expressed like this:

$$\ln w_i = xi\beta_\theta + u_{\theta i} \text{ When } \text{Quant}_\theta(\ln w_i \mid x_i) = x_i\beta_\theta \quad (1)$$

Where x_i is the vector of exogenous variables and β_θ is the vector of the parameters. (ln $w|x$) denotes the θ vo. conditional quantile of ln w given by x. la θ va. Quantile regression, $0< \theta <1$, is defined as the solution to the problem:

$$\min_{\beta \in R_k} \left\{ \sum_{i:\ln w_i \geq x_i\beta} \theta \mid \ln w_i - x_i\beta_\theta \mid + \sum_{i:\ln w_i < x_i\beta} (1-\theta) \mid \ln w_i - x_i\beta_\theta \mid \right\} \quad (2)$$

This is expressed as such:

$$\min_{\beta \in R_k} \sum_i \rho_\theta(\ln w_i - x_i\beta_\theta), \quad (3)$$

Where $\rho_\theta(\varepsilon)$ is the control function defined as $\rho_\theta(\varepsilon) = \theta_\varepsilon \text{ if } \varepsilon \geq 0$ or $\rho_\theta(\varepsilon) = (\theta - 1)\varepsilon \text{ if } \varepsilon = 0$

This problem does not have an explicit form, but it could be solved using linear programming methods. . Standard errors could be obtained through the bootstrap methods. (see Koenker, 2005).

The minimum absolute deviation (MAD) estimated in $\beta$is a particular case in this setting. This is obtained selecting θ =0.5 (regression of the median). The first quantile is obtained selecting θ=0.25 and so forth similarly. When there is an increase in θ from 0 to 1, a sign of the whole distribution of y, conditional to *x*.

Data and Variables

The data is obtained from the micro database of the ENEU and the urban part of the ENET. For this particular case, we will not be using the individual panel, but rather the total observations for the third quarter in 2004, 1996, and 1991. The categories without payment, unemployed and inactive are not included either, since they do not make an income and thus they cannot be part of an income function.

The dependent variable is the logarithm of the labor income per hour. The independent variables being included are education (complete and/or incomplete elementary school, middle-school, high-school, and college) working experience and its squared, married, head of household, male, labor occupational groups, (informal employment, governmental, employer, self-employed) as well as controls of regions (north, center and south regions).

In the following subsections, we will present the results for employees that have a working income in the age range of 18 to 65 years old. We will obtain results for the income function using the quantile regression, where common errors are calculated using the bootstrapping method. We will show results for income quantiles 10, 25, 50, 75, and 90 for the mentioned age groups.

Results

2004 Results

Table 5.1 presents the results for the urban part of the ENET 2004, third quarter of the year, in a quantile regression of the real labor income per hour. The results must be read as a wage premia for having a particular skill (explainable variables) in a determined place of the labor of the worker (income quantile)

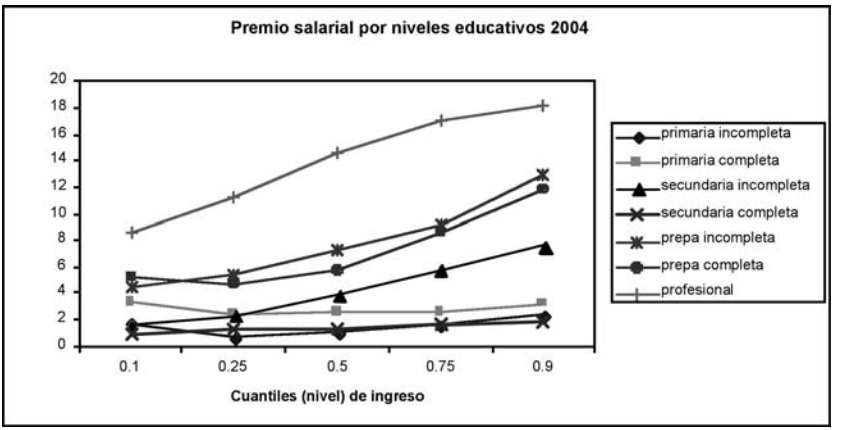
Table 5.1
Regression Results for Income Quantiles 2004
Quantile

Variable	.1	.25	.5	.75	.9
Incomplete Primary	.0511846**	.0204382	.0302701**	.0481907***	.071652***
	(.0265233)	(.0149686)	(.0117865)	(.0146283)	(.0199309)
Complete Primary	.1491348***	.0945392***	.1063048***	.1234635***	.1676048***
	(.0256215)	(.0152091)	(.0115348)	(.0136753)	(.0191575)
Incomplete Secondary	.1723762***	.1289864***	.1633982***	.2097974***	.2817784***
	(.0295809)	(.0181606)	(.0152688)	(.0172899)	(.024478)
Complete Secondary	.1858011***	.1479025***	.1830439***	.2344791***	.3080247***
	(.0256208)	(.0159408)	(.0114809)	(.0139388)	(.0192494)
Incomplete Upper Secondary	.2530756***	.2299767***	.2910544***	.3706626***	.5007157***
	(.0283632)	(.0170138)	(.0135515)	(.0156332)	(.0252299)
Complete Secondary	.3318542***	.3000898***	.3766218***	.500191***	.6786236***
	(.0262393)	(.0168284)	(.0117658)	(.014922)	(.020911)
College	.6341614***	.6920182***	.8869538***	1.099131***	1.315767***
	(.026138)	(.0167268)	(.0134109)	(.0161795)	(.022214)
Married	.0559767***	.0788725***	.0785801***	.0834417***	.105596***
	(.0070435)	(.005846)	(.0051647)	(.0059051)	(.0083876)
Informal employment	-.2199965***	-.1790926***	-.1229857***	-.0663344***	.005781
	(.0071431)	(.0056355)	(.0048342)	(.0063538)	(.0085511)
Government	.1892912***	.2499325***	.277089***	.2687495***	.2334153***
	(.0086998)	(.0069618)	(.0069683)	(.0086934)	(.0101951)
Employer	.133675***	.277602***	.372789***	.4995041***	.6688364***
	(.0199555)	(.0130429)	(.0124937)	(.0136418)	(.0199851)
Self-employment	-.497343***	-.2452206***	-.0382427***	.129792***	.2839413***
	(.0138877)	(.0088229)	(.0069408)	(.0074375)	(.0117071)
Head	.071326***	.0668863***	.0604478***	.0680362***	.076841***
	(.0086219)	(.0059444)	(.0055631)	(.0063712)	(.0090529)
North	.1002312***	.103149***	.1139433***	.1246903***	.1262456***
	(.0138612)	(.0104258)	(.0075823)	(.0091802)	(.0117201)
Center	-.0015398	.0066645	.0108107	.0179019**	-.006217***
	(.0142959)	(.0103409)	(.007225)	(.0093147)	(.0121933)
South	-.2077129***	-.1934692***	-.162836***	-.1231185***	-.1263096***
	(.0157597)	(.0112846)	(.0088197)	(.0103351)	(.0136491)
Man	.0623962***	.0796126***	.096692***	.0975305***	.0712728***
	(.007271)	(.0055834)	(.005026)	(.0057426)	(.0084942)
R2	0.1385	0.1422	0.1752	0.2164	0.2188

N=100044. Standard errors in parentheses. Bootstrapping method is used. Significance levels 1, 5, and 10% respectively. Base categories: formal wage jobs, Capital region: female

In Figure 5.1 wage premia or returns to the estimated educational levels in table 5.1 are shown[4].

Figure 5.1



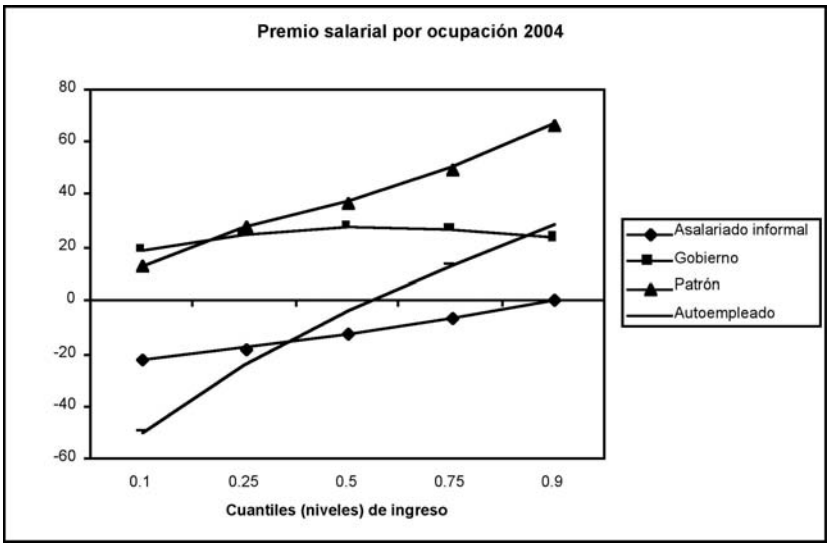
Note: The rates are calculated comparing the previous educational level.

From the chart, we can observe that returns to school tend to be higher when the income level of the employee is higher. The returns to the professional level increase the most as the level of income also increases. These are followed by the high school levels both complete and incomplete, which have similar levels to one another.

For the occupation categories, graph 5.2 shows the wage premia for occupations based in calculations made in chart 5.1, where the comparison base is the category of formal salaried position. We can observe in general that the categories improve their performance as the employee raises his/her income level.

[4] *Calculated by dividing the change in the mid point of the year previous to the study in education level over the change of coefficient obtained in the regression of schooling and the following downwards.*

Figure 5.2



Source: Data based on table 5.1 Comparison category: formal employment.

Individuals working in informal employment commonly receive a negative wage premia compared to individuals working in formal employment. Although their premia is increased, it is not until the highest income levels where they receive a similar premia to the ones received in formal employment. The self-employed individual receives a negative wage premia (in comparison to people in formal employment) until they reach the mid-range income levels, after that, their premia are comparable in size.

For government-employed individuals, the wage premia are positive throughout the income curve. They tend to increase in the mid-range levels and start decreasing slightly in the upper-levels. The employer offers the highest premia compared to formal employment in the market. These premia are always positive throughout the working income curve and in the upper-income levels; they are around 60 percent of the premia.
Looking back at table 5.1, we found that the married variable has a positive sign and it increases based on the income levels. The head of household variable is also positive in all levels. Men in this category have a positive wage premia over women and even though it increases

in the mid-range levels, it tends to decrease slightly in the upper-levels. For the regions variable, if an individual works in the northern region he has a positive wage premia over working in the capital city area (Mexico City and Metropolitan Area). This premia could range between 10 and 12 percent as the working income increases. The mid-region does not have a significantly different premia from the country's capital in the upper-income levels. For the southern region, the wage premia is negative at all levels, and it even decreases as the income increases. This is, for a worker in the southern region compared to a worker with similar characteristics in the Capital, the wage premia is negative and even larger if the worker is in the lower income levels.

1996 Results

Table 5.2 shows the results for the regression by income levels using the third quarter of the year in ENEU 1996 for the real labor income per hour as a dependent variable.

Table 5.2
Regression Results for Income Quantiles 1996
Quantile

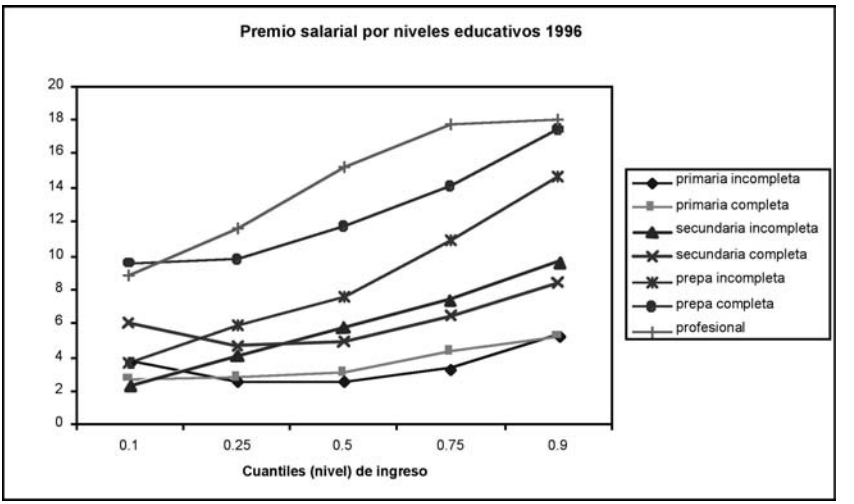
Variable	.1	.25	.5	.75	.9
Incomplete Primary	.1122551*** (.0193429)	.0779013*** (.0155775)	.0767728*** (.0133274)	.1013566*** (.0130383)	.1579764*** (.0172386)
Complete Primary	.1935193*** (.0190364)	.1607395*** (.0151512)	.169556*** (.0130427)	.23062*** (.0127941)	.3145682*** (.0175479)
Incomplete Secondary	.2293548*** (.024222)	.222497*** (.0171238)	.2560976*** (.0145982)	.3409061*** (.0143647)	.4583621*** (.0219159)
Complete Secondary	.3188051*** (.0186295)	.2923388*** (.0158812)	.330222*** (.0131502)	.4376044*** (.0128849)	.584766*** (.0198589)
Incomplete Upper Secondary	.3733448*** (.0210376)	.3803345*** (.0172537)	.4432641*** (.0152478)	.6009575*** (.0170523)	.8054488*** (.0246721)
Complete Upper Secondary	.5161528*** (.0192422)	.5263087*** (.0154924)	.618564*** (.0136497)	.8121152*** (.0143917)	1.066888*** (.0207088)
College	.8227605*** (.020362)	.933857*** (.0161877)	1.151073*** (.0147181)	1.435186*** (.0139282)	1.69914*** (.0199884)
Married	.0686138*** (.0059136)	.0866623*** (.0043049)	.0974822*** (.0044044)	.1046407*** (.0061323)	.1319679*** (.0077828)
Informal employment	-.2657218*** (.0062376)	-.2315485*** (.0048499)	-.2105107*** (.004977)	-.164419*** (.0058265)	-.0749106*** (.0090122)
Government	.2805529*** (.0084216)	.3168207*** (.0061455)	.3018258*** (.0058275)	.233858*** (.0066923)	.1464727*** (.0084852)
Employer	.1697128*** (.0169189)	.2686584*** (.012273)	.3576882*** (.0118846)	.5038049*** (.0162642)	.6580552*** (.0211757)
Self-employment	-.3331458*** (.0098688)	-.1730801*** (.0064)	-.0570363*** (.0060364)	.0521786*** (.0077985)	.1931023*** (.0129109)
Head	.0837167*** (.0071418)	.0818733*** (.0053745)	.0724723*** (.0054951)	.0718272*** (.0064333)	.083737*** (.0088078)
North	-.049037*** (.0087918)	-.0029008 (.0074481)	.0271821*** (.0072134)	.0618053*** (.0100186)	.0810747*** (.0125451)
Center	-.1557438*** (.009551)	-.1184664*** (.007536)	-.1066489*** (.0073342)	-.1011695*** (.0098389)	-.1286197*** (.0125078)
South	-.2297399*** (.0111987)	-.2031403*** (.0077039)	-.1940708*** (.0081512)	-.1730474*** (.0109776)	-.1900191*** (.0145897)
Man	.0280003*** (.0067527)	.0311422*** (.0055246)	.0300351*** (.0046499)	.0202127*** (.0058695)	.0156223** (.0076389)
Working Experience	.0217186*** (.0009291)	.0232724*** (.000622)	.0254699*** (.0006044)	.0283686*** (.0007813)	.029725*** (.0009204)
Working Experience^2	-.0003885*** (.0000187)	-.0003828*** (.0000127)	-.0003789*** (.0000118)	-.0003771*** (.0000148)	-.0003376*** (.0000189)
Constant	1.368827*** (.0227383)	1.562938*** (.0187227)	1.760777*** (.0157221)	1.901385*** (.0192232)	2.019902*** (.0263856)
R^2	0.1571	0.1911	0.2402	0.2760	0.2646

N= 117699. Standard Errors in parentheses. Bootstrapping method is used. Significance levels 1, 5 and 10% respectively. Base category: no schooling; Formal salaried position; Capital region; female.

Table 5.3 shows returns to education by levels and they tend to be increasing if the income (quantile) level increases. The professional category has the highest returns, although they are very similar in the last two income levels. The highest educational levels (professionals and

high-school) grow the fastest as the level of income of the worker also increases, in contrast to the lower educational levels.

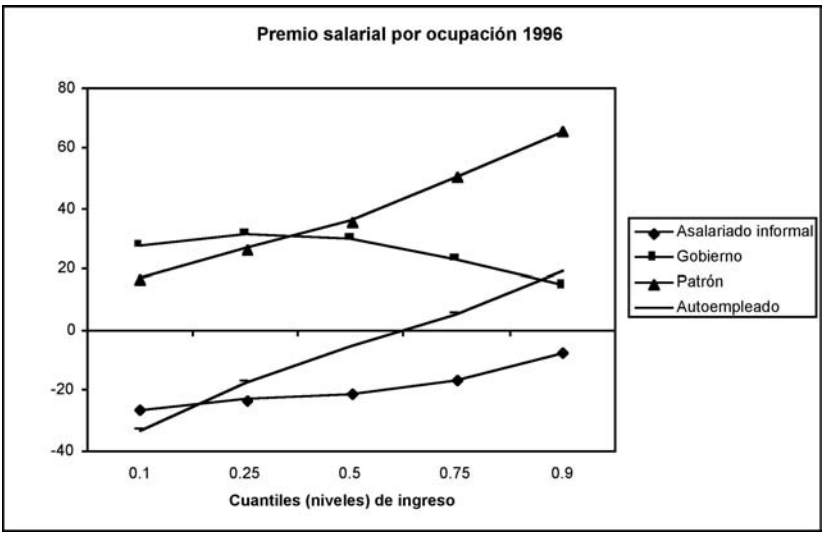
Chart 5.3



Note: The rates are calculated comparing the previous level of education.

Chart 5.4 shows the wage premia by labor categories in 1996 and they are based on calculations in table 5.2. With the exception of government employees, the other categories have wage premia that increase as the working income curve also increases.

Graph 5.4



Source: Data based on table 5.2. Comparison category: formal salaried position.

For this year, we have in chart 5.4 that individuals in informal employment have a negative premia in the labor income curve. Even though this negative premia is limited to the highest levels of income, in general it is significantly lower compared to formal employment. The self-employed workers have a negative premia compared to the formal salaried individuals until the mid-range level, after that, the premia turns into a positive one.

For the government-employed category, chart 5.4 shows a positive premia in the working income curve, which tends to increase slightly toward the mid-range income levels and decreases approximately half toward the upper-levels. The employer category has the highest wage premia compared to formal employment just as it turned out for 2004 previously shown. In the lower income levels, the largest wage premia is given by the government sector.

For the married, the premia is positive and it increases slightly as the curve for working income advances. The heads of household also have a positive wage premia although it is the same throughout the curve of

income. Men have a positive premia compared to women, although it tends to reduce slightly in the higher income levels. The northern region gives a negative wage premia compared to the Capital if the worker is in the lower income levels, changing into a positive premia once the income starts growing. If the worker is in the mid-region, he will have, ceteris paribus, a negative premia compared to a similar worker in Mexico City. For the southern region, the premia is negative and significant at all levels of income, although it tends to decrease slightly in the upper income levels.

Results 1991

Table 5.3 shows the results for the quantile regression using the third quarter in 1991.

Table 5.3
Regression Results for Income Quantile 1991
Cuantil

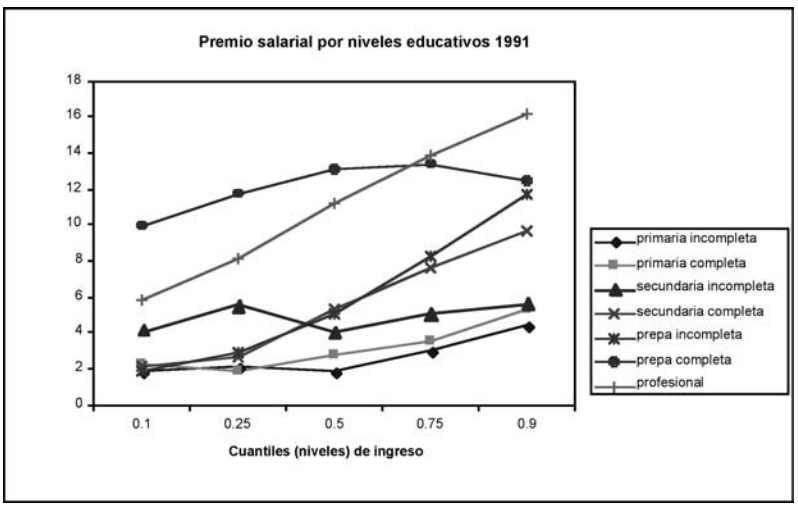
Variable	.1	.25	.5	.75	.9
Incomplete	.0551687**	.0633283***	.0556959***	.0896135***	.1325923***
Primary	(.0267286)	(.0146187)	(.0202473)	(.0202994)	(.0274726)
Complete Primary	.1237991***	.1193638***	.1380245***	.1942556***	.2917048***
	(.0274932)	(.0140155)	(.0189419)	(.0199053)	(.0279492)
Incomplete	.1855255***	.2028266***	.1983221***	.2702281***	.3757836***
Secondary	(.0298567)	(.0166813)	(.0224715)	(.0230815)	(.0335228)
Complete	.2182557***	.2422491***	.2790569***	.3844345***	.5214944***
Secondary	(.0287367)	(.0160813)	(.0204858)	(.0211764)	(.0304094)
Incomplete Upper	.247231***	.2853215***	.3547888***	.5083135***	.6979481***
Secondary	(.0309723)	(.0163914)	(.0239595)	(.02598)	(.0327972)
Complete Upper	.396267***	.4617895***	.5512295***	.7096411***	.8842974***
Secondary	(.0299785)	(.0163283)	(.0214404)	(.0221647)	(.0310439)
College	.6020031***	.7455765***	.944523***	1.196042***	1.451293***
	(.0312218)	(.0175419)	(.0219422)	(.0223244)	(.0302028)
Married	.0823932***	.0818452***	.1120955***	.1187584***	.1307988***
	(.0090953)	(.0073197)	(.0083919)	(.0098344)	(.014494)
Informal	-.1216903***	-.0924429***	-.0511854***	.0040867	.1149119***
employment	(.0082643)	(.0083655)	(.0085879)	(.0109363)	(.0136031)
Government	.1333582***	.1563353***	.1113794***	.0324234***	-.0052923
	.0111906	(.0089152)	(.008792)	(.0105753)	(.0145576)
Employer	.2889954***	.4279039***	.545495***	.6308854***	.7766481***
	(.0260289)	(.0211014)	(.0214468)	(.019615)	(.0257003)
Self-employment	-.1030161***	.0437407***	.151444***	.2172464***	.3178652***
	(.0124856)	(.0102258)	(.0110676)	(.0131751)	(.0167693)
Head	.0441012***	.0724099***	.0683675***	.0803049***	.0829771***
	(.0088653)	(.0072246)	(.0085853)	(.0100242)	(.0139027)
North	.0671651***	.0933573***	.1194034***	.1311516***	.0847959***
	(.0091485)	(.0078559)	(.0090717)	(.011249)	(.0174425)

Center	-.0015701	.0360782***	.0708555***	.0640071***	-.0018299
	(.0096832)	(.0088733)	(.0091711)	(.0112336)	(.0184506)
South	-.1195821***	-.1420149***	-.1859325***	-.2544137***	-.3056093***
	(.0168307)	(.0141396)	(.0147673)	(.0200547)	(.0281755)
Man	.0928302***	.0819983***	.085109***	.085529***	.0928522***
	(.0078159)	(.006441)	(.0075597)	(.0088772)	(.0126079)
Working	.0164481***	.0183565***	.0230506***	.027509***	.0317108***
Experience	(.0011483)	(.0008857)	(.0009473	(.0011634)	(.0016531)
Working	-.0003104***	-.0003189***	-.00037***	-.0003982***	-.0004142***
Experience^2	(.0000216)	(.0000163)	(.0000175)	(.0000223)	(.0000332)
Constant	1.723015***	1.873853***	2.035036***	2.211142***	2.378112***
	(.031586)	(.0195912)	(.023684)	(.0260835)	(.03677)
R^2	0.0960	0.1247	0.1575	0.1922	0.2155

N= 50709. Standard Errors in parentheses. Bootstrapping method is used. ***,**,* Signficance levels at 1, 5 and 10% respectively. Base category: no schooling; formal employment; Capital region; female.

The returns to education by levels shown in Figure 5.5 are growing with the quantile, although for the high school category it tends to decrease very slightly. Once more, the highest education levels tend to grow in their wage premia faster than in the lower education levels. For the lower income levels, the highest wage premia are in the high school category (complete), as for the highest income levels the professional levels offer a larger wage premia.

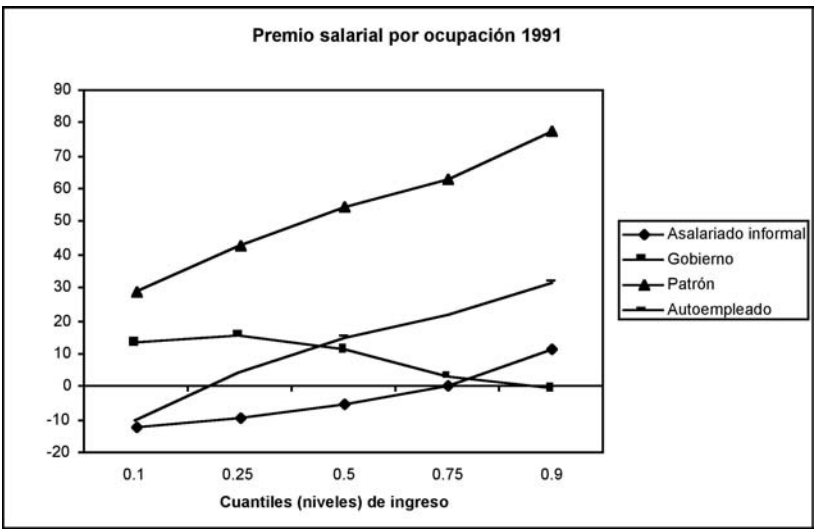
Figure 5.5



Note: The rates are calculated in base to the previous education level.

The wage premia for labor categories are shown in figure 5.6. With the exception of the government category, in all other categories there are growing premia as the income curve advances.

Figure 5.6



Source: Calculations are based on figure 5.3. Comparison category: formal occupied.

Informal employment shows a negative wage premia in the lower levels and it is not until quantile 75 that it evens formal employment. It is significantly different and positive in the higher income group. For the self-employed, the premia is negative for the lower income level only, turning into a positive for all the other quantiles. This is quite different compared to the other years analyzed in this report, in which the mid-range income group is where the premia turns positive.

For those working for the government, based on chart 5.6, the premia is positive, although it is only slightly different to zero and not significant statistically speaking from the base of formal employment in groups in the upper income levels. The performance of government workers is the lowest and decreases faster than in the other years, 2004 and 1996. In the case of the employer category, the tendency for the previously analyzed

years persists, being positive and growing steadily. This is the highest yield from the labor categories.

Just the same as previous years, the married, head of household and male variables all have positive premia. The northern region shows a positive premia in comparison to the workers from Mexico City, while the southern region reflects a negative premia. For the mid-region, the premia are negative at both ends of the curve although not very significant. Meanwhile, the premia are more significant and positive for the mid-range income levels.

General Findings

From the analysis shown in this section, we can infer that returns to education levels are higher when the worker is at a higher income level. After 1996, it seems like returns to lower education levels are reduced compared to the previous years, while the highest levels increase slightly. The effect seems connected to the increase in informal activities which causes a drop in the number of returns and an inefficient allocation of skills especially in the lower levels of education. (see Rodríguez-Oreggia, 2005).

Employer and government activities present the highest wage premia, while informal employment (no social security) have negative wage premia if compared to formal employment. Just the same, self-employed individuals have a negative wage premia (compared to formal salaried positions) if they are in the lower income levels, which tends to change once in the upper income levels.

As for informal employment, maybe the market does not offer a different job alternative, and the same for self-employment in the lower income levels. For the self-employed in the upper income levels, however, the market offers an alternative in this sector, where they receive a larger wage premia. Perhaps a focal point in terms of better working condition policies could be the integration of these groups (informal employment and self-employment in the lower income levels), which will be considered in the following section.

Conclusions

This study aims to analyze the dynamics of the labor market taking as reference the informal sector of employment in different points in time. Especially, changes have been determined between labor sectors using transition matrices to determine labor mobility, as well as the socio-demographic and labor historical effects than have taken place in decision of being in a specific sector, and the proportionate returns in sector by labor income.

The contribution of this study is clearly established in the understanding of the dynamics followed by the informal sector and compared to the formal one. The relevance of the analysis is understood in the sense that a great part of the market takes place in the informal sector, diverting resources and skills to activities with little impact on productivity and growth of the country. Additionally, workers in the informal sector are not protected in terms of social benefits and their addition to the formal sector becomes relevant to policy making issues in the country. The understanding of the dynamics of the informality stated in this study is also relevant for poverty fight policies, since poor families get their income almost exclusively from the labor market, generally from the informal sector.

From the transition matrices calculated, we can learn there is limited labor mobility between categories, which seems to happen mainly among the same informal categories (without social security). The less educated have a higher tendency to move to the informal sector if their income levels are low, and so it happens with self-employed. Additional to lower education, these groups are known for a higher proportion of children under twelve at home and located in groups of older age. The dynamics of these informal groups with a salary and self-employed is originated mainly from the fact of staying in the same informal category, but having strong movements coming from those without a salary or unemployed.

This mobility is limited to informal categories within workers who are already located in these categories and does not allow an adjustment to labor offer, which leads to a vicious cycle of informality in these segments, taking it into a trap for individuals with jobs that offer lower premia for skills.

The mobility mentioned above makes us think, first of all, that it is easier to enter the informal sector, and secondly, that there are barriers to enter the formal sector. Those barriers are mostly derived from regulations that mean a higher cost of employing in the formal sector (with social security),[5] while the other part comes from a regulation framework that does not allow a broader creation of jobs (see Banco Mundial, 2004a). If integration policies from the informal to the formal sector are to be applied, there should be a coordination with the regulation framework and suggest improvements.

On the other hand, the limited mobility shown in the previous analysis is higher among informal categories, also derived from the access to some resources that can be necessary for a higher mobility to formal jobs (with a salary or self-employed, where wage premia for such characteristics are higher), where the resources considered are education, training and access to capital.

A basic requirement to have a higher mobility to formal sectors derives from equal opportunities to access education. Evidence in this paper indicates there is indeed a direct impact of education on mobility between labor categories, especially to the formal one. However, the distribution of education in general (not accounting for quality) is still uneven in the country, especially in higher grades of education. In fact, distribution has a regressive effect on higher levels, i.e. families with higher incomes take the higher benefits (see López-Acevedo and Salinas, 2000 and 2000a). These limitations will certainly keep affecting the structure of limited mobility in the Mexican labor market for some generations if labor policies are not coordinated with education policies.

Youngsters, as it was shown, seem to find a formal job more easily than adult workers, who usually find opportunities in the informal sector. If we link this to the fact that the Mexican labor market develops mainly in small or micro enterprises, it seems like the interest of companies is not given mainly by the creating of consistent skills for those companies,

[5] *For instance: Garro, Meléndez and Rodríguez-Oreggia (2005) find that there is an increase of formal jobs related to diminishing contributions to social security in the 1997 reform, but such increase in too little compared to the size of the total labor force.*

but in getting the jobs in which temporary learning and formality are exchanged to lower wages. In this case, labor policies focused on the most vulnerable groups to stay in informal jobs (less educated, older), cannot be non coordinated from those implemented to create small business, where apparently there are incentives to stay in the informality, without training nor incentives to acquire more skills.

Finally, this study has shown there are family nets that certainly have an impact on individuals obtaining a formal job, especially if another member of the family has already got a job of this kind. Funkhouser (1997) previously pointed that, for Guatemala, the decision of labor offer and hence labor mobility, are partly based on the family, vicinity and common networks. Socialization channels of individuals in our country occur through home and, as stated in this study, influence the limited labor mobility of workers.

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Appendix

Transition Matrices by Age Group, 2003-2004

Transition Matrix 2003-2004. Ages 18-25

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	50.67	18.57	0.63	0.36	5.92	3.23	3.50	17.13	100
Formal Employment	11.69	69.58	2.09	0.19	1.62	0.29	4.37	10.17	100
Public Sector	6.09	7.11	67.51	0.00	1.02	2.03	3.55	12.69	100
Employer	9.68	6.45	3.23	35.48	29.03	6.45	0.00	9.68	100
Self-employment	27.14	4.52	3.52	1.01	34.17	6.53	1.01	22.11	100
Without payment	23.95	5.32	2.28	0.76	4.18	31.94	1.90	29.66	100
Unemployed	24.27	23.01	4.18	0.42	5.02	0.84	15.90	26.36	100
Inactive	9.38	6.76	2.24	0.08	2.03	3.11	3.57	72.82	100
Total	20.05	21.72	4.36	0.44	4.25	3.98	4.05	41.16	100

Transition Matrix 2003-2004. Age 26-35

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	53.87	15.97	2.88	2.08	11.51	1.29	1.98	10.42	100
Formal Employment	9.49	77.90	2.12	1.00	3.12	0.27	2.26	3.85	100
Public Sector	2.97	4.72	86.50	0.94	1.21	0.13	0.94	2.56	100
Employer	15.43	7.98	1.60	39.89	29.26	2.13	1.06	2.66	100
Self-employment	14.27	7.40	2.64	4.62	54.03	2.38	1.06	13.61	100
Without payment	10.24	4.82	1.20	3.61	15.66	33.13	0.00	31.33	100
Unemployed	25.00	26.47	6.62	1.47	5.88	0.00	11.76	22.79	100
Inactive	6.27	3.43	1.71	0.12	8.40	2.01	1.71	76.35	100
Total	16.18	24.91	12.35	2.63	13.11	2.08	1.87	26.86	100

Transition Matrix 2003-2004. Age 36-45

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	51.21	15.15	2.41	3.22	14.21	0.67	2.14	10.99	100
Formal Employment	10.94	75.49	2.34	1.46	3.81	0.10	1.86	4.00	100
Public Sector	1.93	2.31	90.94	0.77	1.73	0.19	0.19	1.93	100
Employer	7.12	7.74	1.86	51.08	26.32	1.55	1.24	3.10	100
Self-employment	11.16	3.01	1.90	7.81	60.38	1.34	2.01	12.39	100
Without payment	2.33	2.33	0.00	4.07	17.44	44.77	0.58	28.49	100
Unemployed	26.77	11.02	3.94	3.94	15.75	0.79	13.39	24.41	100
Inactive	4.63	1.25	1.25	0.89	7.01	2.55	1.25	81.18	100
Total	12.53	16.66	17.22	5.14	15.92	2.43	1.63	28.47	100

Transition Matrix 2003-2004. Age 46-55

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	51.38	10.83	1.57	2.95	16.34	1.18	1.97	13.78	100
Formal Employment	7.31	80.38	1.35	0.58	4.23	0.38	2.31	3.46	100
Public Sector	0.51	2.19	90.91	0.67	1.18	0.17	0.51	3.87	100
Employer	6.72	6.30	1.68	46.64	30.67	1.26	0.00	6.72	100
Self-employment	12.28	1.79	1.15	5.75	62.66	1.92	0.90	13.55	100
Without payment	3.74	0.93	0.00	1.87	17.76	48.60	0.93	26.17	100
Unemployed	19.57	15.22	8.70	4.35	21.74	0.00	10.87	19.57	100
Inactive	4.65	1.18	0.63	0.39	7.24	1.65	0.24	84.02	100
Total	11.96	13.23	14.27	4.60	19.58	2.46	1.01	32.89	100

Transition Matrix 2003-2004. Age 56-65

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	43.56	12.44	0.89	4.44	17.33	0.44	1.33	19.56	100
Formal Employment	10.47	65.45	2.09	2.09	3.14	0.52	1.57	14.66	100
Public Sector	1.47	0.00	79.41	0.74	5.15	0.74	0.00	12.50	100
Employer	6.90	3.45	0.00	45.69	32.76	0.86	0.86	9.48	100
Self-employment	9.79	2.13	0.21	4.26	59.79	3.19	0.64	20.00	100
Without payment	1.64	0.00	0.00	3.28	24.59	26.23	0.00	44.26	100
Unemployed	5.88	5.88	0.00	0.00	17.65	0.00	0.00	70.59	100
Inactive	2.71	0.27	0.09	0.90	6.33	1.36	0.36	87.96	100
Total	8.88	7.37	5.00	4.31	19.78	2.15	0.60	51.92	100

Transition Matrices by Age Groups, 1995-1996

Transition Matrix 1995-1996. Age 18-25

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	49.84	20.27	2.35	0.55	6.65	3.29	3.99	13.07	100
Formal Employment	12.72	71.99	1.99	0.44	1.69	1.10	3.38	6.69	100
Public Sector	6.67	6.42	70.12	0.00	2.47	1.23	3.70	9.38	100
Employer	24.32	5.41	5.41	21.62	18.92	5.41	2.70	16.22	100
Self-employment	24.57	9.22	4.78	3.75	34.47	7.51	3.41	12.29	100
Without payment	21.13	7.04	1.97	0.00	6.20	30.42	2.54	30.70	100
Unemployed	23.61	24.28	5.35	0.00	4.01	2.90	13.14	26.73	100
Inactive	10.04	6.96	2.46	0.14	2.42	3.25	3.84	70.89	100
Total	19.66	23.04	6.50	0.51	4.76	4.26	4.27	37.01	100

Transition Matrix 2003-2004. Age 26-35

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	51.99	16.86	3.16	2.22	11.36	1.17	2.46	10.77	100
Formal Employment	7.93	79.66	1.97	1.42	3.66	0.27	2.37	2.71	100
Public Sector	2.81	3.54	87.29	0.73	2.60	0.00	0.63	2.40	100
Employer	7.36	8.14	1.94	46.12	28.68	4.65	1.94	1.16	100
Self-employment	13.92	5.36	2.17	7.28	54.41	3.07	2.55	11.24	100
Without payment	9.87	1.97	1.32	4.61	13.16	40.13	1.32	27.63	100
Unemployed	20.62	15.98	13.40	3.09	9.79	1.03	12.37	23.71	100
Inactive	6.26	2.99	1.25	0.38	5.50	1.80	1.41	80.41	100
Total	13.60	23.10	14.84	3.73	12.53	2.24	2.13	27.82	100

Transition Matrix 2003-2004. Age 36-45

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	40.23	22.74	6.12	2.62	12.54	0.58	0.00	15.16	100
Formal Employment	10.12	64.49	5.76	4.05	8.26	0.47	0.31	6.54	100
Public Sector	3.38	10.71	65.60	4.14	6.20	0.19	0.56	9.21	100
Employer	8.37	17.24	6.90	35.96	24.14	1.97	0.49	4.93	100
Self-employment	13.16	11.40	5.04	7.24	45.39	1.10	0.66	16.01	100
Without payment	1.79	0.00	7.14	1.79	8.93	26.79	0.00	53.57	100
Unemployed	13.64	22.73	0.00	4.55	22.73	4.55	13.64	18.18	100
Inactive	3.84	3.92	3.59	0.49	6.78	2.94	0.33	78.10	100
Total	10.03	19.81	14.15	4.92	13.74	1.93	0.46	34.96	100

Transition Matrix 2003-2004. Age 46-55

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	43.93	12.43	1.45	6.07	20.81	0.29	2.60	12.43	100
Formal Employment	10.64	74.28	2.00	2.22	4.66	0.44	1.11	4.66	100
Public Sector	1.31	1.87	87.29	1.87	2.62	0.19	0.19	4.67	100
Employer	4.71	5.10	2.35	52.94	27.45	1.57	1.57	4.31	100
Self-employment	10.09	3.03	1.15	9.22	54.90	1.73	1.15	18.73	100
Without payment	4.12	2.06	1.03	4.12	17.53	45.36	0.00	25.77	100
Unemployed	22.22	5.56	1.39	4.17	27.78	4.17	12.50	22.22	100
Inactive	3.87	0.61	0.53	0.61	6.83	1.59	1.14	84.81	100
Total	9.56	11.57	13.38	6.77	18.18	2.34	1.35	36.85	100

Transition Matrix 2003-2004. Age 56-65

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	46.03	8.99	1.06	3.17	17.99	1.06	1.06	20.63	100
Formal Employment	12.24	67.35	1.36	1.36	2.72	0.68	0.68	13.61	100
Public Sector	2.17	1.45	81.16	1.45	2.17	0.00	0.00	11.59	100
Employer	11.72	1.56	1.56	50.00	21.88	0.78	0.78	11.72	100
Self-employment	6.94	0.72	0.72	6.22	59.09	2.63	1.91	21.77	100
Without payment	3.70	0.00	0.00	0.00	16.67	42.59	0.00	37.04	100
Unemployed	11.11	5.56	0.00	13.89	25.00	2.78	13.89	27.78	100
Inactive	1.85	0.48	0.32	0.24	6.27	2.09	0.32	88.42	100
Total	7.69	5.56	5.31	4.59	17.50	2.76	0.89	55.69	100

Transition Matrices by Age Groups, 1990-1991

Transition Matrix 1990-1991. Age 18-25

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	37.52	29.15	3.46	0.29	5.77	3.61	3.46	16.74	100
Formal Employment	15.55	61.48	3.25	0.36	2.98	1.45	2.35	12.57	100
Public Sector	11.31	16.25	57.95	0.00	1.77	0.35	3.18	9.19	100
Employer	28.57	19.05	4.76	14.29	14.29	9.52	0.00	9.52	100
Self-employment	18.79	20.61	1.21	3.03	35.15	3.64	1.82	15.76	100
Without payment	11.21	10.34	0.86	0.00	6.90	32.76	1.72	36.21	100
Unemployed	15.52	30.17	11.21	0.86	5.17	0.86	6.90	29.31	100
Inactive	8.42	12.40	3.52	0.12	2.02	3.17	2.83	67.53	100
Total	16.01	29.00	7.13	0.40	4.44	3.40	2.86	36.75	100

Transition Matrix 1990-1991. Age 26-35

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	38.00	28.00	5.20	3.80	12.20	0.20	0.60	12.00	100
Formal Employment	9.41	68.54	4.56	1.52	7.41	0.38	1.24	6.94	100
Public Sector	4.67	15.30	64.57	1.29	4.19	0.32	0.64	9.02	100
Employer	9.42	15.22	4.35	42.03	22.46	0.72	1.45	4.35	100
Self-employment	13.92	17.40	6.26	6.73	38.52	1.16	1.16	14.85	100
Without payment	2.44	6.10	6.10	3.66	13.41	23.17	1.22	43.90	100
Unemployed	30.91	21.82	7.27	0.00	9.09	0.00	7.27	23.64	100
Inactive	5.81	4.49	3.79	0.44	4.30	2.53	0.95	77.70	100
Total	11.25	25.55	12.93	3.14	10.00	1.61	1.05	34.47	100

Transition Matrix 1990-1991. Age 36-45

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	40.23	22.74	6.12	2.62	12.54	0.58	0.00	15.16	100
Formal Employment	10.12	64.49	5.76	4.05	8.26	0.47	0.31	6.54	100
Public Sector	3.38	10.71	65.60	4.14	6.20	0.19	0.56	9.21	100
Employer	8.37	17.24	6.90	35.96	24.14	1.97	0.49	4.93	100
Self-employment	13.16	11.40	5.04	7.24	45.39	1.10	0.66	16.01	100
Without payment	1.79	0.00	7.14	1.79	8.93	26.79	0.00	53.57	100
Unemployed	13.64	22.73	0.00	4.55	22.73	4.55	13.64	18.18	100
Inactive	3.84	3.92	3.59	0.49	6.78	2.94	0.33	78.10	100
Total	10.03	19.81	14.15	4.92	13.74	1.93	0.46	34.96	100

Transition Matrix 1990-1991. Age 46-55

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	38.54	14.06	6.25	5.21	14.58	1.56	1.56	18.23	100
Formal Employment	11.32	59.75	5.66	4.09	8.18	0.31	1.89	8.81	100
Public Sector	5.13	12.39	65.38	1.28	3.42	0.43	0.85	11.11	100
Employer	5.93	14.81	5.93	42.96	26.67	0.00	0.00	3.70	100
Self-employment	9.68	9.09	4.69	7.62	50.44	2.05	0.29	16.13	100
Without payment	3.23	0.00	3.23	0.00	6.45	25.81	0.00	61.29	100
Unemployed	11.11	22.22	0.00	11.11	33.33	0.00	0.00	22.22	100
Inactive	2.58	2.48	1.76	1.14	4.03	1.24	0.10	86.67	100
Total	8.53	14.50	10.10	5.48	14.09	1.44	0.58	45.29	100

Transition Matrix 1990-1991. Age 56-65

	Informal Employment	Formal Employment	Public Sector	Employer	Self-employment	Without payment	Unemployed	Inactive	Total
Informal Employment	35.34	15.52	1.72	3.45	16.38	0.00	2.59	25.00	100
Formal Employment	12.28	57.02	3.51	0.88	8.77	0.00	0.88	16.67	100
Public Sector	3.03	13.64	57.58	1.52	3.03	1.52	0.00	19.70	100
Employer	11.67	8.33	1.67	36.67	21.67	1.67	0.00	18.33	100
Self-employment	6.11	5.00	1.67	7.78	51.11	1.67	0.00	26.67	100
Without payment	0.00	0.00	0.00	0.00	30.77	23.08	0.00	46.15	100
Unemployed	0.00	25.00	0.00	0.00	75.00	0.00	0.00	0.00	100
Inactive	2.06	1.80	0.90	1.29	5.91	1.67	0.26	86.12	100
Total	6.84	9.09	4.13	3.91	14.20	1.58	0.45	59.80	100