

Unemployment Insurance and Transitions in the Labor Market: An Evaluation of Brazil's Program¹.

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1. Introduction

Beginning in the early 1970s, with growing unemployment in many European countries, interest in the role performed by unemployment insurance programs gained heightened importance in specialized literature. Initial evaluations focused in particular on the negative effects of these programs on the labor market [Atkinson and Micklewright (1991)].

Although the advantages provided to workers were recognized, emphasis was placed on the adverse effects of unemployment compensation programs on incentives to work⁴. The main criticism of these programs is that they increase unemployment, especially by reducing the opportunity cost of leisure time and the search for

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⁴ A widely disseminated opinion exists which states that unemployment compensation programs increase the well being of workers by providing for the transfer of funds between the various possible occupational states, especially in the situation of employment to unemployment. We define a transition in the labor market as the move from one occupational state to another.

employment. This situation challenges policy makers to confront the trade-off between the “generosity” of benefits and the level of unemployment⁵.

The occurrence of the effects arising from the replacement of the income of unemployed workers is based on two effects. The first is the so-called “adverse selection” due to the fact that workers that need to “purchase” unemployment insurance are exactly those with the greatest risk of becoming unemployed. The second effect is the well-known “moral hazard” which promotes a change in the behavior of workers in the direction of becoming less active in getting out of the situation of unemployment. Thus, in accordance with the characteristics and the size of the unemployment insurance program, these effects have acted to affect innumerable occupational transitions in the labor market, but which only in the early 1990s began to be addressed in literature on the subject.⁶

Within this scenario and anticipating the difficulties involved in addressing this relatively new subject in Brazil, the objective of this paper is to evaluate the impacts of the unemployment insurance program on some of the principal transitions in the Brazilian labor market.⁷ Greater understanding of these impacts is of course of particular interest to those dedicated to the study of the labor market. Further, this knowledge is extremely valuable for those responsible for the creation of public policy affecting the labor market. However, in our view the case of Brazil holds some special characteristics that stimulate redoubled interest by those evaluating these programs, especially if from a much wider perspective.

This article is organized in five sections in addition to this introduction. The next section summarizes discussion on the role of unemployment insurance in transitions in the labor market, focusing on some of its negative impacts with an

⁵ One of the recurrent explanations for the higher level of unemployment in many European countries in comparison to the United States is the generous unemployment benefits in much of Europe. See, *inter alia*, Scarpetta (1998).

⁶ For a critical review of initial studies on the impact of unemployment compensation programs, see Atkinson and Micklewright (1991). Subsequently Schmid and Reissert (1995) present a broad outline of OECD countries.

emphasis on why an evaluation of the particular case of Brazil is so important. Section three briefly describes Brazil's unemployment insurance program, with a view to its importance for defining the parameters to be used in the estimates. Section four presents the methodology used in the study. The principal results are presented in section five. Finally, the last section features final comments, followed by a bibliography and appendix.

2. Unemployment Insurance and Adverse Impacts on the Labor Market

The presentation in the introduction on the impact of payment of benefits and its subsequent effects on occupational states calls for caution in the initial interpretation that has been much discussed in the literature that followed the pioneering studies of the early 1990s. Some of the most salient points that must be made are:

- (a) The increase in unemployment resulting from the longer period of time used to search for job does not necessarily mean a reduction in efficiency, since this additional time for research could represent a productive investment by allowing an improved allocation of workers among the various jobs available;
- (b) Initial studies tended to divide occupational situations in the labor market between employment and unemployment. However, many workers moving out of unemployment (employment) move towards a state of inactivity rather than to a state of employment (unemployment). As such, there are many ways in which unemployment insurance can affect the flows into and out of inactivity, transitions which were practically ignored in many previous investigations⁸;

⁷ The program in Brazil, for example, differs from the international tradition of financing the payment of benefits through taxation of wages, which is in itself an important element for understanding some of the transitions induced by unemployment insurance.

⁸ Clark and Summers (1990) present evidence that benefits to the unemployed in the United States increase the levels of both unemployment and employment. This occurs because these workers increase their level of participation in the workforce. However, the authors emphasize that part of the flows into and out of inactivity could reflect an effect caused by reporting practices and not an actual change in behaviors. In

- (c) In general, analyses based exclusively on the trade-off between “generosity” of benefits and the level of unemployment assume that the impact of unemployment insurance can be summed up in the level of benefits. This does not take into account that for a given level of wage replacement, a varying number of payment installments and various arrangements of unemployment insurance can have very distinct impacts on transitions in the labor market. These other parameters of programs include the monitoring of the search for a new job, eligibility criteria, integration with other unemployment assistance programs, etc.⁹; and
- (d) The argument that unemployment insurance increases unemployment by providing incentives for employees to become unemployed and discouraging the pursuit of new employment does not completely illustrate the issue. Many reasons can properly explain an opposite effect. For example, the benefits of unemployment insurance can increase the “attractiveness” of employment by reducing the costs of unemployment¹⁰. On the other hand, if the search for a new job involves monetary costs, unemployment insurance can increase the intensity and efficiency of the search. Various empirical studies have identified a positive relationship between the level of benefits and unemployment. However, as pointed out by Atkinson and Micklewright (1991), the impact is generally small and far from robust¹¹.

It is important to note that not only the level of benefits and the design of the program are important. The state of the economy can also play an important role. Thus,

addition to inactivity, literature has suggested the inclusion of other occupational situations, such as inclusion in occupational training programs and distinctions among the various types of jobs.

⁹ In the view of authors such as Layard, Nickell and Jackman (1991), the integrated action of active and passive policies in Sweden had the effect of contributing to reduce the problems associated with moral hazard. Thus, this type of integration could be one of the explanations for the fact the Sweden has a relatively generous unemployment insurance system while at the same time having relatively low unemployment.

¹⁰ This is of particular importance for those without insurance. This argument is even relevant for those with insurance, since workers that have been fired generally have the right to a set number of benefit installments for a fixed period of time, and the risk of being fired is not zero.

¹¹ In general, unemployment insurance can affect all transitions in the labor market and there can be more than one effect with distinct signs for each transition. This makes an *a priori* evaluation of the net effects of

the same unemployment insurance program applied in different countries can have different impacts in terms of the incentives generated. Here it is important to point out that the vast majority of studies of the impact of unemployment insurance on transitions in the labor market have been conducted in developed countries. These countries have more homogenous labor markets with well-established and evolved unemployment insurance programs. However, to generalize these results for developing countries is a mistake.

A distinct feature of labor markets in developing countries (which has received much attention in literature on the subject) is the existence of a large informal sector¹². This makes it possible, for example, for workers that have lost their jobs in the formal sector to receive unemployment insurance while simultaneously holding a job in the informal sector¹³. On the other hand, unemployment insurance can make a job in the formal sector more attractive for many workers which, if this insurance did not exist, would opt for becoming permanently established in the informal sector. Thus, many of the effects of unemployment insurance on transitions in the labor market observed in studies conducted in developed countries, could in developing countries be reflected in flows into and out of the informal labor market.

Focusing again on the case of Brazil, there are still other factors that should be mentioned in this study:

- (a) Brazil's unemployment insurance program is very widespread by the standards of developing countries and is the largest in Latin America [Thomas (1999)];

unemployment insurance on transitions in the labor market very difficult. For an evaluation of the possible impacts of unemployment insurance on transitions see Schmid and Reissert (1995).

¹² Clearly the measurement of the informal labor market is not free of controversy, mainly due to the changes in its characteristics in recent times, where changes in production sectors have created other types of "informal" jobs in addition to traditional ones. Independent of this occurrence, the informal market has expanded in these countries.

¹³ A general rule in the international experience is that only workers in the formal sector make contributions to unemployment insurance (Chahad, 1999). Free entry in the informal sector has been cited as one of the most important characteristics for at least a significant part of this segment [Fields (1990)]. These aspects together with the difficulties encountered in policing make the strategy of receiving unemployment insurance benefits while holding a job in the informal sector a relatively easy option to adopt.

- (b) Notwithstanding the high degree of coverage of workers in the formal sector, Brazil has a large informal sector. More than half of the occupied population does not have a formal labor contract and thus does not have the right to unemployment insurance benefits.
- (c) Brazil's unemployment insurance system dates back to 1986 and as such has a considerable history, even though relatively new. The program suffered many changes during this period, including changes in the calculation method of wage replacement, the system of granting the maximum number of installments, and, most importantly, in eligibility criteria, which have been relaxed over time. Since the level of wage replacement varies in accordance with the actual wage, the level of benefits expected from the program vary in a fixed period for individuals with different characteristics; in the same way they vary over time for individuals with the same characteristics. This aspect is extremely convenient for the type of study conducted herein; and
- (d) Brazil has a consolidated and relatively sophisticated system of statistics by the standards of developing countries. In particular, it conducts a monthly survey of households that allows us to observe the occupational status of the same individual for four consecutive months, and thus observe their effective transitions in the labor market¹⁴. This survey began to be utilized in the early 1980s, and thus before the implementation of the unemployment insurance program. This allows us to evaluate the transitions that took place in the labor market since the beginning of the program.

The study conducted herein utilizes the technique of microsimulations and as such is subject to all of the limitations of this type of approach. The strategy compares different individuals according to the level of benefits they would receive in the event of their dismissal without just cause from the company. In this way the study attempts to evaluate the impact on a particular transition in the labor market caused by a change in

¹⁴ The study referred to is the Monthly Employment Survey (*Pesquisa Mensal de Emprego - PME*) conducted by the Brazilian Geography and Statistics Institute (IBGE). A household that enters the sample

the benefits of a particular individual, assuming that all other factors remain constant. This is done for each individual of the sample, with the result for the labor market obtained from the aggregate of these individual effects. As such, the impacts of unemployment insurance on, for example, the policy for determining the level of employment and wages in companies was not taken into account in this exercise.

3. Principal Characteristics of Unemployment Insurance in Brazil

The program grew considerably from its implementation in 1986 until the end of 1998. In 1998, the program provided benefits to 4.4 million workers, approximately 6% of the economically active population. The average benefit payment was 1.56 minimum monthly wage, which represents annual expenditure of US\$ 3.5 billion or some 0.58% of GDP. In addition, the program had a high rate of utilization of some 99.0%, indicating that practically every applicant becomes a beneficiary of the system (Chahad and Fernandes, 2000).

At present, the basic criteria for eligibility to the program is that the worker has received a wage for a continuous period of six months immediately prior to dismissal. The criteria for eligibility have become more inclusive over time. At the beginning of the program, workers, in addition to the above requirement and other restrictions, were required to prove that they had contributed to the Social Security System for at least 36 months out of the last 48 months¹⁵. The principal changes to these criteria occurred in the early 1990s, with the regulation of unemployment insurance by Law 7,998/90. Between 1987 and 1992 the number of beneficiaries increased five-fold, providing an idea of the impact of these changes.

of the PME is studied for four consecutive months, is excluded from the sample for eight months, after which it returns to the sample to be studied for another four months.

Once a worker was considered eligible for benefits he received the right to receive a set number of benefit payments for a period of time (benefit period), which currently is set at 16 months¹⁶. The number of benefit payments varies from 3 to 5, depending on the worker's period of employment¹⁷. From the beginning of the program until June 1994, the number of benefit payments was set at four. In theory, payments were to be suspended once the worker found a new job or began to receive another source of income. However, there is no mechanism of enforcement in place and workers are not subject to an integrated job and training program. In practice, payments are only suspended if the new job is in the formal sector. Even if employment is in the formal sector, there are many ways to avoid compliance with legislation¹⁸.

From the beginning of the program until July 1987, the monthly benefit payment was equal to 50.0% of the previous wage for workers earning up to three minimum wages (SM) and 1.5 SM for workers that earned more than 3 SM. The minimum amount of the monthly benefit was set at 0.7 SM. Beginning in May 1995, the monthly benefit payment was equal to 80.0% of the previous wage for workers earning up to 1.65 SM; and 0.8 SM plus the difference between the actual wage and 1.65 SM for workers that earned between 1.65 SM and 2.75 SM; and 1.87 SM for workers that earned over 2.75 SM. In order to comply with the constitutional mandate, beginning in January 1990 the minimum monthly benefit was set at 1 SM. Various changes to these rules took place between August 1987 and May 1995.

Compared to OECD countries, Brazil does not have extremely "generous" unemployment insurance benefits, although the criteria for eligibility for workers in the

¹⁵ This requirement at the start of the program highly restricted eligibility to the program, since the eligibility of the unemployed worker was based on the contribution period of the early 1980s, when the strong recession severely reduced the number of contributors to the Social Security System.

¹⁶ Until January 1990 the benefit period was set at 18 months. The benefit period establishes the required grace period that must be met before the worker may once again receive benefits, once all other eligibility criteria have been met. Within the benefit period, the receipt of benefit payments may be continuous or intermittent.

¹⁷ A period of employment from six to 11 months recorded in a worker's employment registry booklet gives the worker the right to three benefit payments; from 12 to 23 months, 4 payments; and from 24 months forward, 5 payments.

formal sector are relatively easy to meet. Nevertheless, the argument has been made that very strong adverse incentives are generated by the program due to other characteristics of the program and/or the Brazilian labor market¹⁹. The most important of these factors are:

- (i) In Brazil, in contrast to the case in countries such as the United States, the contributions of companies to the fund that grants the payment of benefits to unemployed workers is not linked to dismissals that it makes. This reduces on the margin the cost of dismissal and thereby increases the probability of dismissals²⁰;
- (ii) Unemployment insurance is only one of the programs that provide benefits to unemployed workers. Another important program is the Workers' Time of Service Guarantee Fund (FGTS), which provides severance pay. FGTS serves as a compulsory savings account which workers may access on certain occasions, in particular in the case of being fired²¹. In addition to the low liquidity, FGTS balances are remunerated at interest rates that are significantly lower than those of the market. With the objective of gaining access to their FGTS funds, workers may adopt conduct that could increase their probability of dismissal. This behavior is further reinforced by the existence of a fine (40.0% incident on the balance of the fund) that the company must pay to the worker in the event that he is fired²²; and

¹⁸ Workers may hold more than one employment registry booklet, which makes it difficult to ascertain if he is actively employed.

¹⁹ See, for example, Barros, Corseuil and Fogel (1999).

²⁰ Contributions by companies occur indirectly through contributions to the Workers' Support Fund (FAT). In addition to financing unemployment insurance, FAT finances other programs that provided assistance to workers, such as a professional training program. It is important to note that although other workers' assistance programs exist, these programs are completely separate. For an evaluation of the integration between active and passive policies in the Brazilian labor market, see Chahad (1999).

²¹ Companies are required to make a monthly deposit in the worker's account equal to 8.0% of their monthly wage. FGTS funds may be used to finance the purchase of a home. In addition to dismissal, other important reasons for accessing the funds are retirement and the purchase of a home. In the event of death of the accountholder the funds may be withdrawn by a dependent. See, *inter alia*, Chahad and Fernandes (2000).

²² As is the case with unemployment insurance, workers cannot access their FGTS balance if they leave their job voluntarily. However, in many cases workers that leave their jobs voluntarily are registered as being fired. In these cases the worker returns the amount of the fine paid by the company and then is able to withdraw the FGTS balance and receive the unemployment benefits. Barros, Corseuil and Fogel (1999)

- (iii) The impact of unemployment insurance on the time spent looking for a job may be magnified by the large size of the informal labor market in Brazil.

Since the beginning of the unemployment insurance program, some analysts warned that the design proposed was inadequate in terms of stimulating the search for a new job (for a review of this aspect see Chahad, 1999). With the development of new sources of information, recent studies have confirmed the fact that Brazil's unemployment insurance program has failed, at least in part, in its attempt to be a mechanism of financial support to facilitate the search for a new job. This is because the majority of beneficiaries were not actively involved in the search for employment at the time of their interview. The majority of them were either employed or inactive²³. It is important to point out that the fact that a person has received unemployment insurance in the last 30 days (which is how the question is put in the source of data used as reference) while at the same time being employed does not necessarily mean an infringement of legislation. The person could have become employed after receiving the benefits.

present evidence that around 2/3 of employees in the formal sector that voluntarily left their jobs had access to their FGTS balance.

²³ See Barros, Corseuil and Fogel (1999) and Thomas (1999). These studies are based on figures from the Living Standards Report (*Pesquisa sobre Padrões de Vida - PPV*) of the IBGE. The PPV covers the South and Northeast Region, which represents some 65.0% of Brazil's population.

Table 1 - Beneficiaries of Unemployment Insurance in the Last 30 Days							
	Beneficiaries (%)	Average Work Week (hrs)	Avg. Income (R\$) *	Average Unemplmt Insurance (R\$)	Unemplmt Insurance / Average Income	With Formal Contract	% with 0 Income and Missing
Unemployed - month	26,03%	-	-	126,58	-	-	-
Inactive - month	23,29%	-	-	187,35	-	-	-
Employed - less than 1 month	12,33%	42	50,00	141,88	283,75%	55,60%	88,89%
Employed - from 1 to 2 months	10,96%	51	279,38	172,63	61,79%	0,00%	0,00%
Employed - more than 2 month	10,96%	42	739,88	238,63	32,25%	50,00%	0,00%
Employed - duration ignored	16,44%	-	-	-	-	-	-

* Only income other than 0 and missing are included.

Source: PPV - IBGE.

Table 1 above uses the same source of information as the above studies. The tables show that 24.0% of those employed stated that they were in the job for less than one month and 32.0% ignored the amount of time in their job²⁴. Although the size of the sample was small (73 cases), the table provides evidence that a significant part of beneficiaries receive insurance benefits along with the wage of a current job. Another part receives insurance and does not actively look for a new job. An important factor is that for beneficiaries employed for more than one month, both the work week and the level of income do not indicate that these jobs are of short-term nature and 2/3 of them were employed without a formal labor contract.

In closing this section it is important to point out that Table 1 provides evidence that a significant part of beneficiaries of unemployment insurance show signs of behavior that violates the program's objectives. However, this provides little information on the impact of unemployment insurance on transitions in the labor market. Information is not provided on how the situation of these workers would be different in the absence of this

²⁴ Those that did not have a job in the week of the survey but had some initiative to look for a job in the last month were considered as unemployed. Those that did not have a job and did not actively look for work in the last month were considered as inactive.

program nor is any given on how the situation would be for those workers that were not receiving any benefits at the time of the survey.

4. Methodology

The methodology adopted is based on the work of Clark and Summers (1990). The population of working age (15 to 60 years) was divided into four possible occupational states: (a) employed and insured; (b) employed and non-insured; (c) inactive; and (d) unemployed.

The group of employed and insured workers includes all those employed in the private sector that hold a formal labor contract and those employed in the public sector that adhere to the employment system of the private sector. The group of employed and non-insured includes those employed without a formal labor contract; the self-employed; employers; and employees in the public sector, which, in adherence to the legislation that governs civil servants, do not have a right to unemployment insurance benefits²⁵.

Employees without a formal labor contract and the self-employed are often grouped as workers in the informal sector. Since employees without a formal contract and the self-employed make up the vast majority of the employed and non-insured²⁶, we refer to this last group as informal employment. The group of employed and insured workers is referred to as formal employment.

Workers that did not have a job in the week of the survey but had some initiative to look for a job in the last month were considered as unemployed. Those that did not have a job and did not actively look for job in the last month were considered as inactive.

²⁵ This is of course a strong hypothesis, but one that we could not avoid due to the manner in which information is available in the source of data used.

²⁶ According to PME estimates, workers without a formal contract and the self-employed represent approximately 49.0% of the EAP in the six principal metropolitan regions.

4.1. Theoretical Approach

Let P be an individual in population P. This individual may at any specific point in time be in one of the four occupational states in the labor market considered: formal employment(f), informal employment(i), unemployed(u) and inactive(n).

Thus, for a specific period of time, we may define:

p_u^p = the period of time that this worker is expected to remain unemployed.

p_n^p = the period of time that this worker is expected to remain inactive.

p_f^p = the period of time that this worker is expected to remain employed in the formal sector.

p_i^p = the period of time that this worker is expected to remain employed in the informal sector.

These periods of time for an individual selected at random from P would be:

$$\Pi_j = \frac{1}{P} \sum_{p=1}^P p_j^p \quad \text{where, } j = \text{“u”}, \text{“n”}, \text{“f”} \text{ and } \text{“i”} \quad (1)$$

Thus, we may define the following aggregates:

$$\frac{\Pi_f}{\Pi_f + \Pi_i} = \text{rate of formal employment}$$

$$\frac{\Pi_u}{\Pi_u + \Pi_f + \Pi_i} = \text{rate of unemployment}$$

$$\Pi_n = \text{rate of inactivity}$$

One of the principal objectives of this study is to evaluate the evolution of these rates and the average duration in each of these occupational states. At the same time we

seek to identify how they were influenced by changes in unemployment insurance legislation.

Thus let us assume that:

$$\mathbf{p}_j^p = \mathbf{p}_j^p(c, b, a) \quad (2)$$

where,

a = the time period representing the conditions in the labor market

b = the unemployment insurance benefits

c = the vector of individual characteristics (sex, age, level of education and family position)

The strategy adopted was to model \mathbf{p}_j^p , for each $p \in P$, in each time period (between 1984 and 1997), and thus calculate for each period the aggregate rates defined above. In order to observe the impact of unemployment insurance, the procedure adopted was to recalculate these rates for $b = 0$, and compare the two estimated trajectories

The problem with this strategy is that \mathbf{p}_j^p ($p = 1, 2, \dots, P$) are not observable variables. However, taking into account that the probabilities of transitions among the various states are independent of the time that the individual remains in a particular state²⁷, and making use of the steady state condition, we can show that:

$$p_r^p \mathbf{p}^p = \mathbf{p}^p \quad (3)$$

where,

²⁷ Transitions between occupational states in the labor market are treated as a Markov process.

$$p_r^p = \begin{bmatrix} p_{ff}^p & p_{fi}^p & p_{fu}^p & p_{fn}^p \\ p_{if}^p & p_{ii}^p & p_{iu}^p & p_{in}^p \\ p_{uf}^p & p_{ui}^p & p_{uu}^p & p_{un}^p \\ p_{nf}^p & p_{ni}^p & p_{nu}^p & p_{nn}^p \end{bmatrix} \quad \text{and} \quad \mathbf{p}^p = \begin{bmatrix} p_f^p \\ p_i^p \\ p_u^p \\ p_n^p \end{bmatrix}$$

The matrix p_r^p captures the transitions of the individual p , and p_{jk}^p is the probability of this individual being in state k in $t+1$, provided he is in state j in period t .

It is important to note that an equation of the linear system described in (3) is a linear combination of the other equations, in other words, the matrix p_r^p is not full rank. However, we may use the relation stated in $\mathbf{p}_f^p + \mathbf{p}_i^p + \mathbf{p}_u^p + \mathbf{p}_n^p = 1$, substitute it in any of the equations, and through this process solve the system.

In addition to the expected period of time, the matrix p_r^p makes it possible to calculate, for each $p \in P$, the duration expected of a complete period in each of the occupational states, as follows.

Let D_j^p be the expected duration of a complete period in state j , thus:

$$D_j^p = \frac{1}{1 - p_{jj}^p} \quad (4)$$

Thus, the procedure adopted in the study was to estimate the matrix $p_r^p(c, b, a)$ for each individual in the sample, and calculate the rates and aggregate durations of unemployment, inactivity, formal employment and informal employment for each of the years considered in the period. To evaluate the impact of unemployment insurance, these aggregates were recalculated, considering the non-existence of unemployment insurance, in other words, $b = 0$.

4.2. Gauging Process

4.2.1. The Source of Data

The basic source of information used in this study is the Monthly Employment Survey (*Pesquisa Mensal de Emprego - PME*) conducted by the Brazilian Geography and Statistics Institute (IBGE). The PME is a household survey conducted monthly for the six principal metropolitan regions of Brazil (São Paulo, Rio de Janeiro, Porto Alegre, Belo Horizonte, Recife and Salvador). This study considered only individuals between 15 and 60 years of age that live in the São Paulo metropolitan region.

According to the data collection methodology of the PME, a household that enters the sample is investigated for four consecutive months. After a period of eight months the household is once again investigated for another four months. This feature of the survey allows us to observe the monthly transition between occupational states for the various individuals of the sample²⁸. Each month the PME sample includes four distinct groups (lots): one entering the sample for the first time that year, one entering for the second time, one for the third, and finally one for the fourth time.

The procedure adopted was to treat each month as an independent sample, only utilizing the occupational information for the following month for individuals that made up the sample for a specific month. Each month only $\frac{1}{4}$ of the sample was used so as to simplify the study and reduce the size of the sample. This was done in such a way so that no one individual would be included in the sample in two consecutive months²⁹. This procedure generated a sample of 594,863 observations for the period between January 1984 and December 1997.

²⁸ Unfortunately, the PME does not inquire as to whether or not the unemployed worker receives unemployment benefits.

²⁹ We worked only with lots 1 and 2 of the PME. In January, lot 1 was used and the occupational situation of these individuals was observed in February. In February lot 2 was used and the occupational situation of these individuals was observed in March. Lot 1 was once again used in March, and so on. Although the sample for each month was treated as an independent sample, it is possible for the same group of individuals to enter the sample again, but not in consecutive months.

4.2.2. Estimating Individual Transition Matrixes

To estimate the individual probabilities of transition, four logit multinomial models were used, one for each occupational group in the base month. The dependent variable, assuming values from 1 to 4, refers to the occupational state in the following month. The independent variables selected were: age, the square of age, the number of years of education completed, a dummy variable for sex, a dummy for heads of family, 13 dummies for year, and a value for the unemployment insurance benefit, which was plotted for each individual in the sample.

For example, taking the individuals that were unemployed in the base month, the logit multinomial generates an estimate of the probability of a certain individual moving into each of the possible states in the period $t+1$, provided that the individual was unemployed in period t . The estimated coefficients were used to plot the probabilities for each of the individuals in the sample. Thus, the estimates of the models provide an estimate of p_r^p , for each $p \in P$.

4.2.3. Plotting Unemployment Insurance Benefits

The last step necessary for implementing our estimates is to plot a benefit for each individual in the sample. Note that unemployment insurance provides the right to receive benefits for those that acquire the right to benefits (obtain a job in the formal sector) and are fired by the company. Essentially the aim is to evaluate how this right affects transitions in the labor market³⁰. Thus we must plot the expected benefit in the case of dismissal for an individual employed in the formal sector. So in order to evaluate the benefits granted by the unemployment insurance program, it is necessary to observe three

³⁰ Clark and Summers (1990) sought to evaluate the effect of these rights for each individual in the sample, based on the worker's occupational state at the time of the study. One of the problems with this procedure was that the worker's occupational state could already be a reflection of the program. This led to a problem with endogeneity. However, it is almost impossible for a study of this type to be completely free of problems with endogeneity. At any rate, the procedures adopted by the authors are not appropriate for the present study since the necessary information is not available. The PME does not inquire as to whether or not the unemployed worker receives unemployment benefits.

distinct elements that occur in the payment of the insurance benefit: the rate of wage replacement, the duration of the benefits, and the ease of eligibility.

Since the payment of unemployment insurance in Brazil began in July 1986, a null value was attributed to the benefit of individuals in samples between January 1984 and June 1986. For all other situations, the procedure adopted is as follows.

The view was taken that the important factor is the total volume of benefits which the worker has the right to receive, in other words, the rate of wage replacement multiplied by the number of installments³¹. For the calculation of the rate of wage replacement, a figure corresponding to the wage that was being earned in the formal sector was plotted for each individual. The table of benefits in effect at the time was then applied to this plotted wage. The plotting of the wage was based on a regression of the log-wage for each year, and only for workers in the formal sector, using the following independent variables: age, the square of age, the number of years of education completed, a dummy variable for sex, and $n-1$ dummies for months, where n is the number of months in the year that have individuals in the sample³². Thus, the rate of wage replacement plotted varies among individuals of different characteristics in any one year, and over time in a single group.

The number of benefit installment payments was considered to be 4 for the entire period. This was the maximum number of installments allowed until June 1994. After this date, the number of benefit payments varied from 3 to 5, depending on the worker's period of employment. Since we do not have more precise information to calculate the expected number of installments, employees in the formal sector that are dismissed are arbitrarily given the intermediate number of installments.

³¹ It can be argued that the right to receive R\$ 500.00 in 5 monthly installment payments of R\$ 100.00 has a very different impact than the right to receive R\$ 500.00 in 2 installments of R\$ 250.00. In practice, however, since the maximum number of installment payments has varied little in Brazil, this hypothesis does not compromise much.

³² Except for the years 1984 and 1985, $n = 12$. In 1984, the regression was estimated only for the second half of the year ($n=6$) and in 1985 there were no individuals in December ($n=11$). This was due to a change in the survey questions, which made it impossible to locate these individuals in January 1986. The expected wages were used in the place of observed wages, even for individuals in the formal sector.

The rate of wage replacement and the number of installments provide us with the total amount of benefits that a worker in the formal sector can receive in the event that he becomes insured. For this study it is important to obtain the expected benefit amount even though the worker may not be eligible to receive it. Thus we must multiply the value obtained above by the probability of the worker meeting the necessary eligibility criteria. This probability is strongly determined by legislation, which, as we have seen, has changed significantly. The problem lies in estimating this probability as a function of legislation.

Note that that if we define a_i as the probability that individual i is dismissed from his job in certain period (if he was employed in the formal sector), and assuming that the only criteria for eligibility for unemployment insurance was to remain in a job for a period of time in excess of n , then the probability that this individual would have access to benefits, provided that he was dismissed, would be $(1 - a_i)^n$. If the probability of dismissal from a job was fixed, we would be able to use information for the number of beneficiaries and the number of workers in the formal sector that were dismissed to evaluate the impact of legislation on the probability of eligibility. For a group of individuals of a specific characteristic, the probability of eligibility could be calculated simply by the ratio between the number of beneficiaries and the number of workers dismissed. Changes in this ratio between different periods would be fully explained by changes to legislation, in this case changes in n .

The problem with this procedure is that the probabilities of dismissal are not fixed. Probabilities may vary due to general conditions in the economy and changes in the behavior of workers, influenced by changes in legislation. Thus, adopting this procedure incurs problems with endogeneity. However, these problems could not be eliminated. The information on beneficiaries and dismissals by segment of the population could not be obtained in order to make this procedure possible. We were only able to obtain information for the set of workers in each of the years analyzed. The procedure adopted was as follows:

Based on the legislation in effect, the four periods in which the eligibility characteristics remained relatively stable were identified:

- i) July 1986 to January 1990
- ii) February 1990 to December 1991
- iii) January 1992 to June 1994
- iv) July 1994 to December 1997

Using information from the Labor and Employment Ministry, the ratio of beneficiaries to dismissed workers was calculated for each of the years³³. The average of the ratios for the years 1987, 1988 and 1989 were used as the probability that a worker dismissed in the formal sector would receive access to unemployment insurance benefits for the first period (17.37%). For the second the average between 1990 and 1991 was used (47.21%). The average of the years 1992 and 1993 were used as the probability of eligibility for the third period (66.16%). Finally, for the fourth period the average of the years 1995, 1996 and 1997 was used (64.95%).

Thus, for each individual the benefit was considered to be the product of the rate of wage replacement, the maximum number of installments and the probability of eligibility, in accordance with the hypothesis described above.

5. Results

With basis on the procedures described above we sought to identify the impact of unemployment insurance on the rate and duration of employment in the formal sector, unemployment and inactivity. In the regressions the coefficients of the benefit variable were not statistically significant, at 5% in 5 of the 12 possible cases. This occurred in the occupational transitions from formal employment to unemployment; from formal

³³ This information was used for the country as a whole.

employment to inactivity; from unemployment to formal employment; and from unemployment to informal employment. The values of the coefficients were considered for the purposes of the simulation, however the significance level was not taken into account.

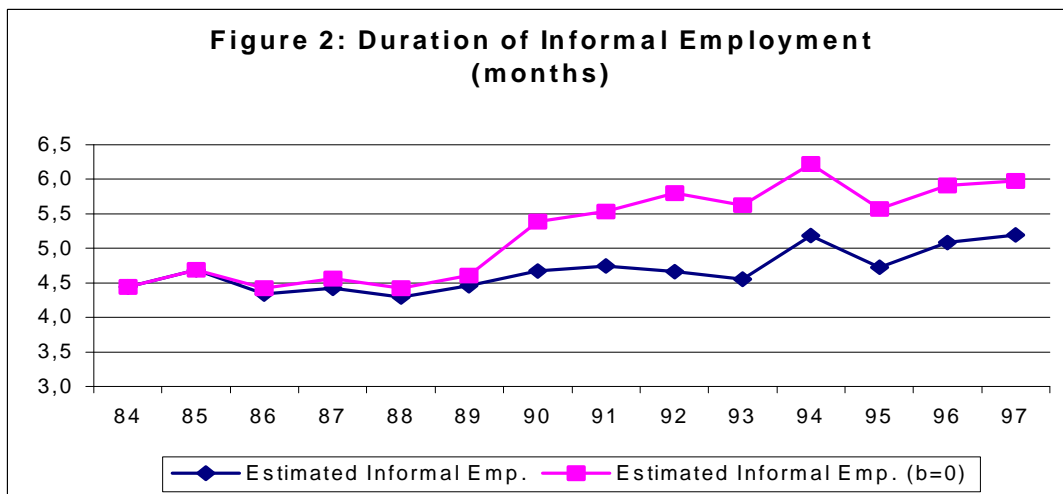
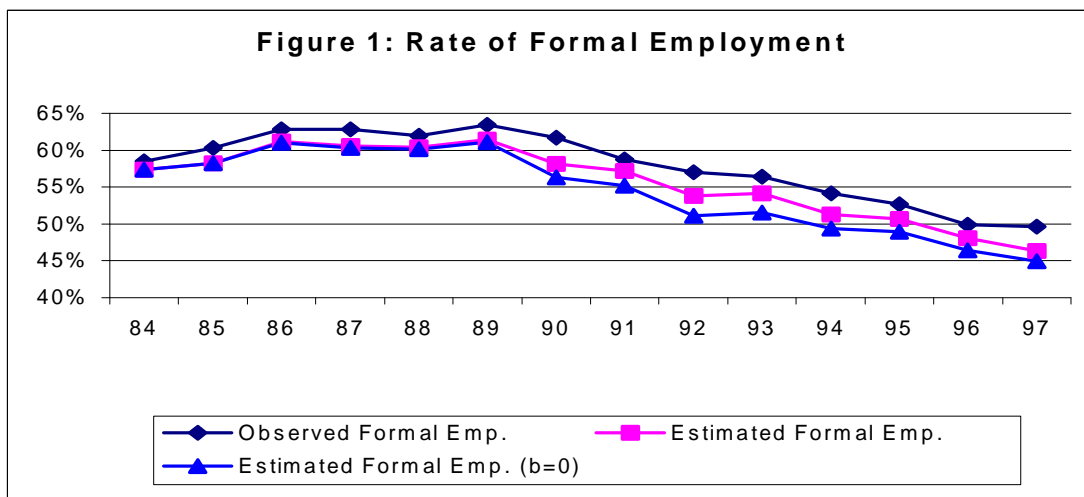
5.1. Rate of Formal Employment

Figure 1 shows the evolution of the rate of formal employment for Metropolitan São Paulo. The observed value was obtained directly from the sample and as such its comparison with the estimated rate provides a measure of the fitness of the estimation procedure. The result shows that the estimated model does a relatively good job of predicting the trajectory of this rate. Comparison between the estimated and simulated rates (with $b=0$) evaluates how unemployment insurance affected the behavior of this rate. Figures point to a sharp reduction in the rate of formal employment beginning in 1989, which is compatible with other evidence, but shows that unemployment insurance has little influence on its trajectory.

The tables in the appendix show the annual averages for the estimates of the probabilities of transitions, both with and without the impact of benefits. The tables show that the probability of moving out of the formal labor market ($1 - P_{fr}$) is only slightly affected by unemployment insurance. The transition from formal to informal employment experienced a slight increase with the inclusion of benefits, while the probabilities of the transition from formal employment to unemployment and inactivity experienced a slight reduction.

It is important to remember that in the latter two cases, the benefit coefficients were not statistically significant. In this light, our results do not support the hypothesis that unemployment insurance provides incentives for workers to adopt behavior that would lead to dismissal from their job in the formal sector. On this point our study presents results that reinforce the studies conducted for developed countries, which do not present results of a strong impact of unemployment insurance on the flow from

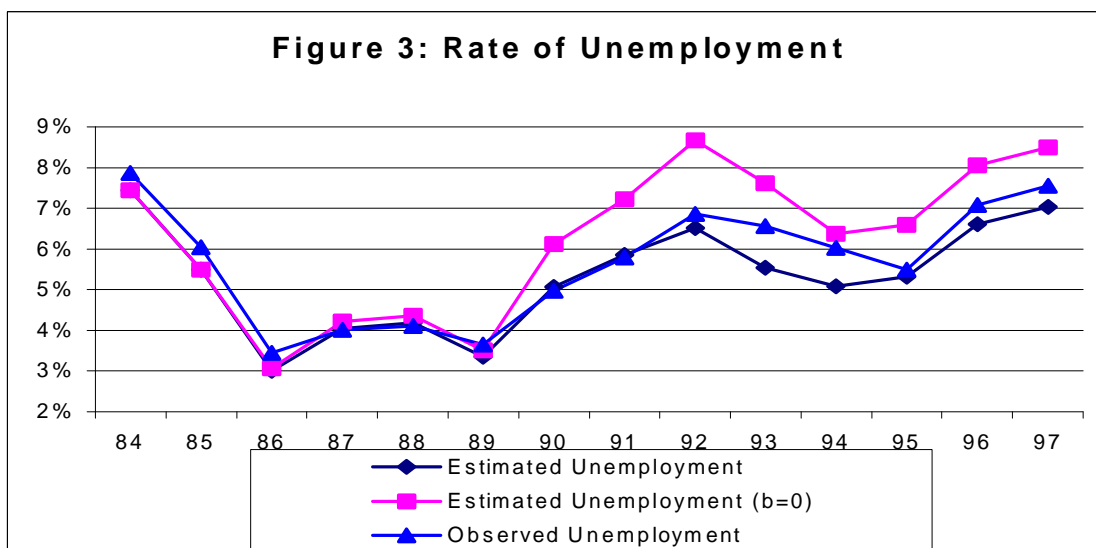
employment to unemployment [Atkinson and Micklewright (1991)]. Note that unemployment insurance has a positive impact on the transition from informal employment to formal employment.

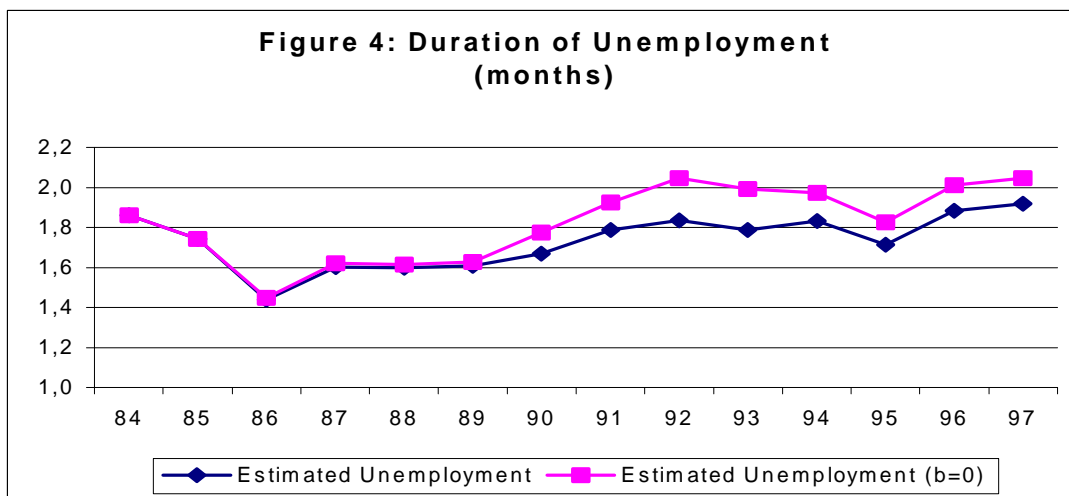


The probability of a transition out of the informal sector increases with the inclusion of unemployment insurance, which reduces the average duration of a complete employment period in this occupational state (see Figure 2). The transition from unemployment to the informal sector remains practically unchanged with the introduction of unemployment insurance, while the transition from inactivity is slightly reduced.

5.2. Rate of Unemployment

Figures 3 and 4 show a surprising result: unemployment insurance has a negative effect both on the rate and average duration of unemployment. This contradicts all the evidence available for developed countries. Using the year 1997 as a base, the rate of unemployment fell from 8.5% to 7.04% with the inclusion of benefits, while the duration of unemployment was reduced in 0.13 months. Figure 3 also shows that the estimation procedures adopted forecast with reasonable precision the trajectory of the rate of unemployment.





The relationship between unemployment and inactivity merits special attention. The average duration of a complete period in unemployment is some two months, which is very low. The PME contains a question for the unemployed which asks for how long they have been in this situation. According to the survey, the average period of unemployment is around four months, or double our estimates.

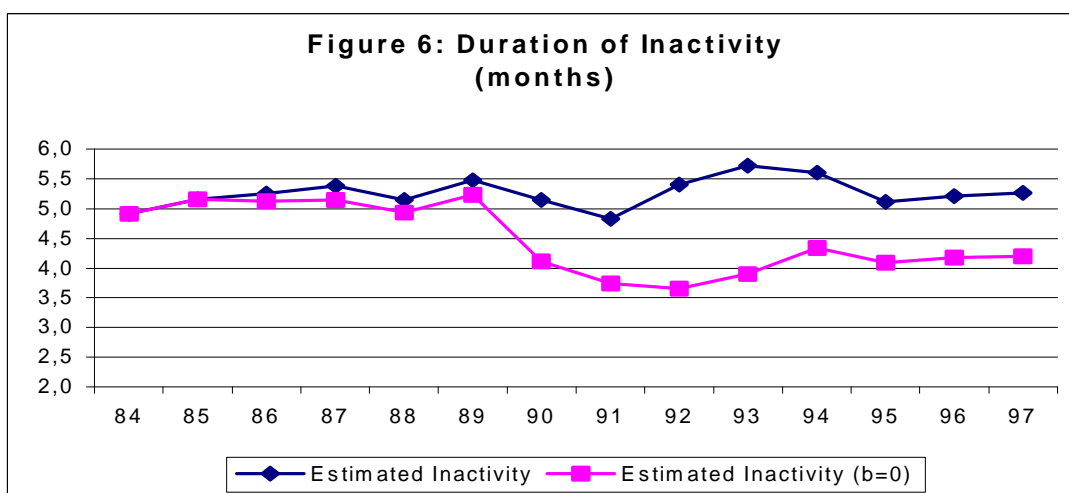
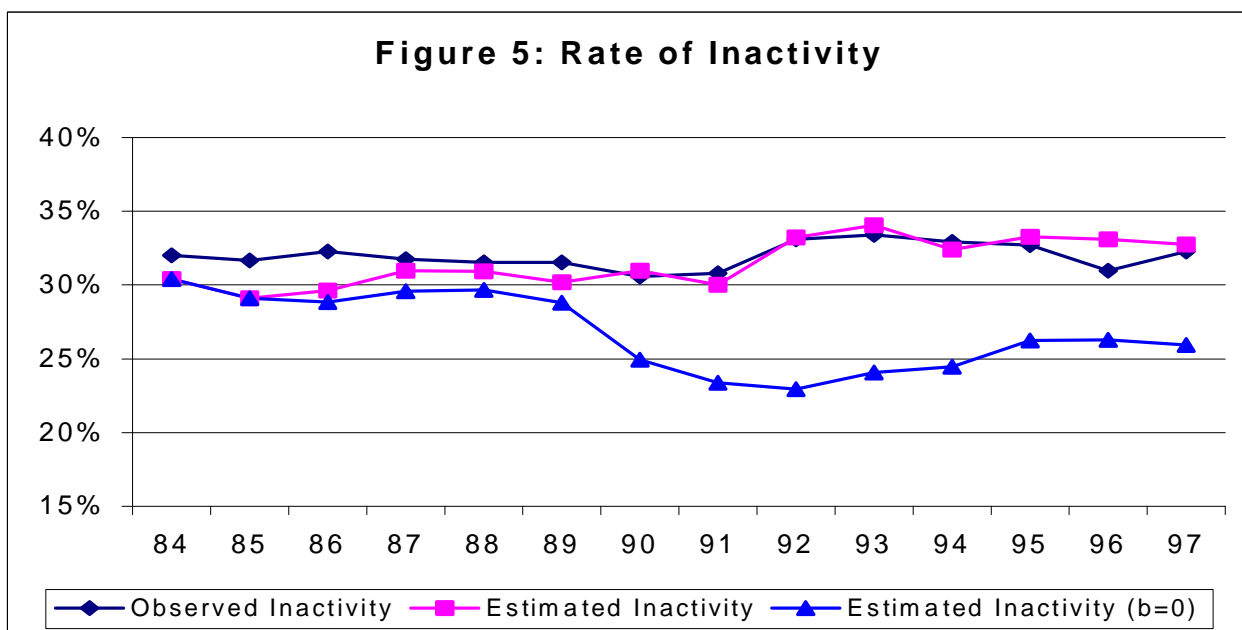
The hypothesis that the probabilities of transitions follow a Markov process implies that the average duration of a period of unemployment can be calculated by two methods. First, by the average of the inverse of the individual probabilities of moving out of unemployment, and also by the average period of unemployment of those workers that at any given moment are unemployed. Thus, a portion of the difference observed could be due to our hypothesis that the probability of moving out of the state of unemployment is independent of the period of time that the person is in this situation. This, however, does not seem to fully explain the story.

Another important aspect is the way in which the question about the period of unemployment is asked. For example, a worker who lost his job eight months ago and has not found a job since then can declare that he has been unemployed for eight months. However, this does not mean that he actively searched for a job in all of the eight months. According to our definitions, he must have alternated between a situation of unemployment and inactivity during these eight months.

The impact that was to be expected in the state of unemployment seems to be occurring instead in the state of inactivity. The probabilities of transitions (see the tables in the appendix) show that the increase in the flow out of unemployment as a result of unemployment insurance basically moves into inactivity. The transition from unemployment to employment rose slightly with the introduction of unemployment insurance, while the probability of the transition to informal employment fell. On the other hand, the probability of moving out of inactivity into employment or into unemployment was significantly reduced.

5.3. Rate of Inactivity

The principal impact of unemployment insurance is an increase on both the rate and average duration of inactivity, as shown in figures 5 and 6. Figures for 1997 show that unemployment insurance increases the rate of inactivity from 25.93% to 32.75%, and lengthens the average period of inactivity from 4.2 months to 5.3 months. Once again, our estimates forecast the trajectory of inactivity with a high degree of precision.



An important factor is that our sample contains only people with less than 61 years of age, which should reduce the weight of retirement on the rate of inactivity. The evidence suggests that, on average, individuals reduce the period of time spent on searching for a new job. In other words, the probability that a person that does not hold a

job has actively searched for one in the last month falls with the inclusion of unemployment insurance.

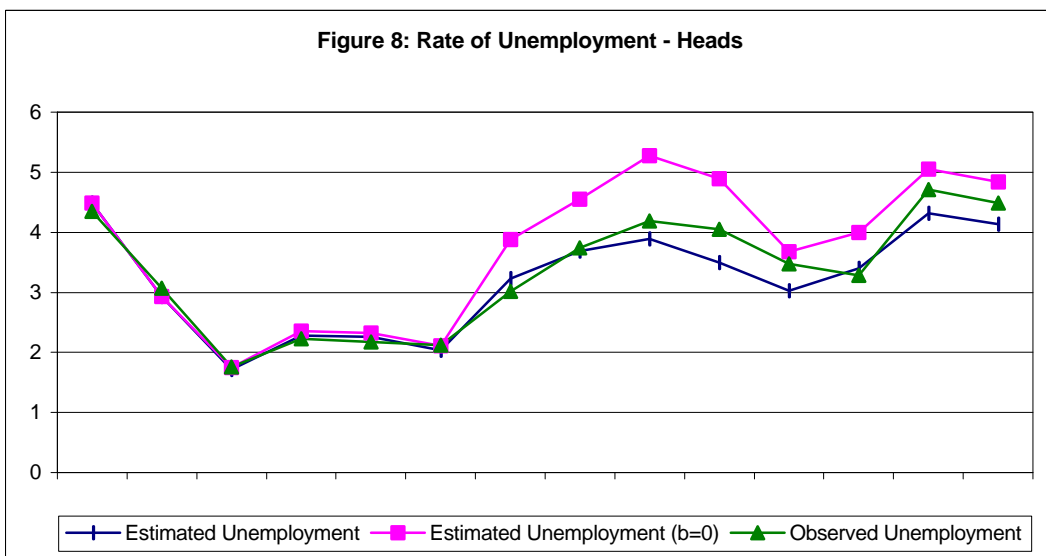
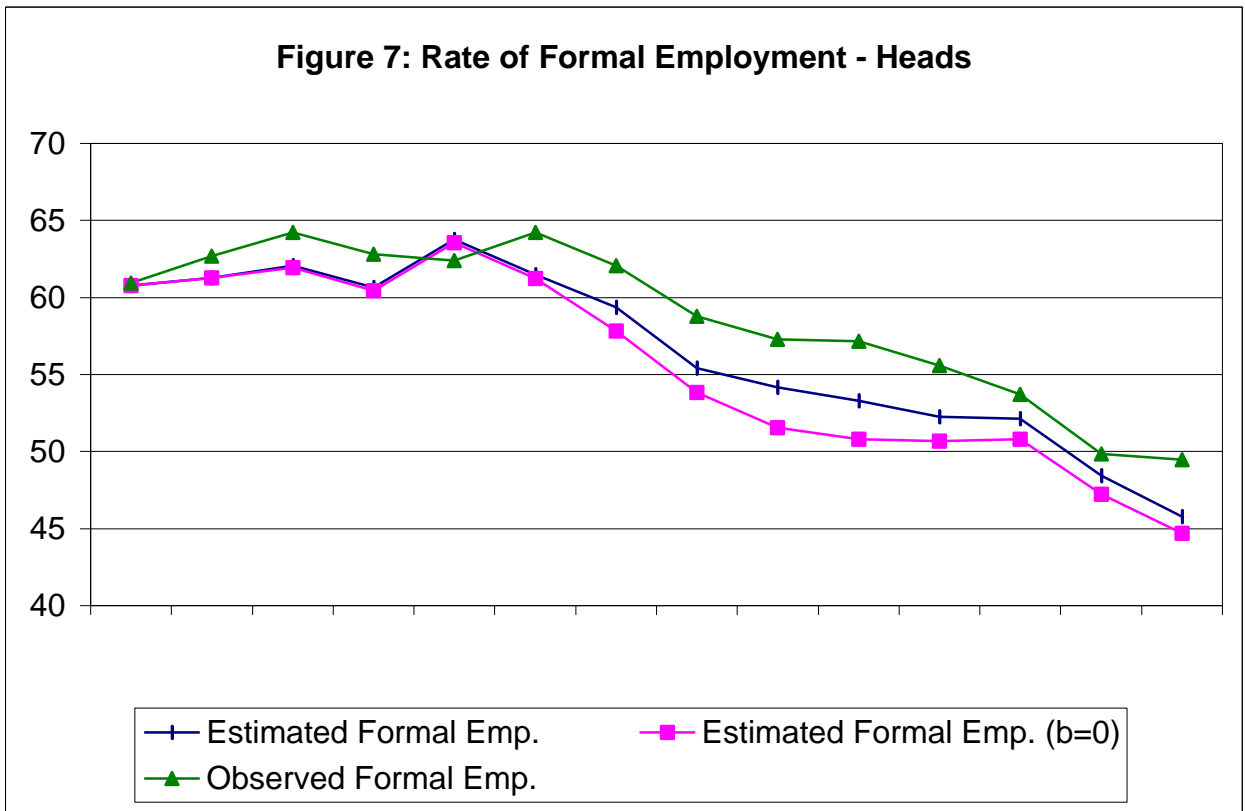
In short, the impact of an increase on the rate of inactivity due to the existence of unemployment insurance is without a doubt the most important result obtained in this study, but which merits a more detailed investigation. An initial interpretation is that individuals that have lost their jobs may be reducing the amount of effort used in the search for employment. Workers leave the labor market, only to return when the period of benefit payment is nearly over. This is one of the negative effects of unemployment insurance.

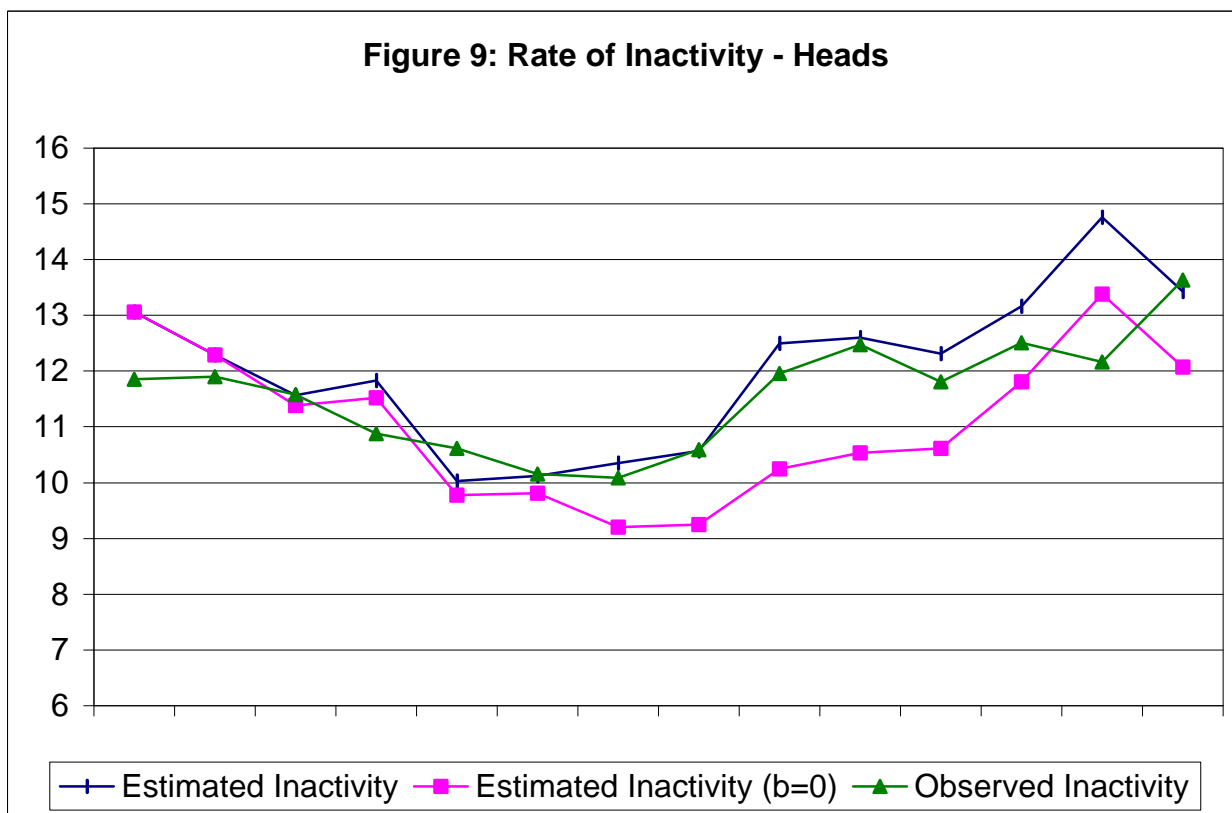
The results presented above reflect the average impact of unemployment insurance. An interesting issue to analyze would be to verify this impact for two distinct sub-populations: heads of families and non-heads of families. Unemployment insurance may have a different impact on these sub-populations in at least two aspects. In general, heads of families have a greater presence in the workforce and a lower rate of wage replacement, since their wages are higher on average. This analysis is carried out in the next two sub-sections.

5.4 The Impact of Unemployment Insurance on Heads of Families

The estimation procedures presented above were reproduced for the sub-populations of heads and non-heads of families. The principal results for heads of families are shown in figures 7, 8 and 9.

The tables show that the qualitative result of unemployment insurance on the rates of formal employment, unemployment and inactivity on heads of families was similar to that for the total population. However, the intensity of this effect was greatly reduced, especially on the rate of inactivity. Our results, considering only heads of families, indicate that unemployment insurance has a very weak impact.

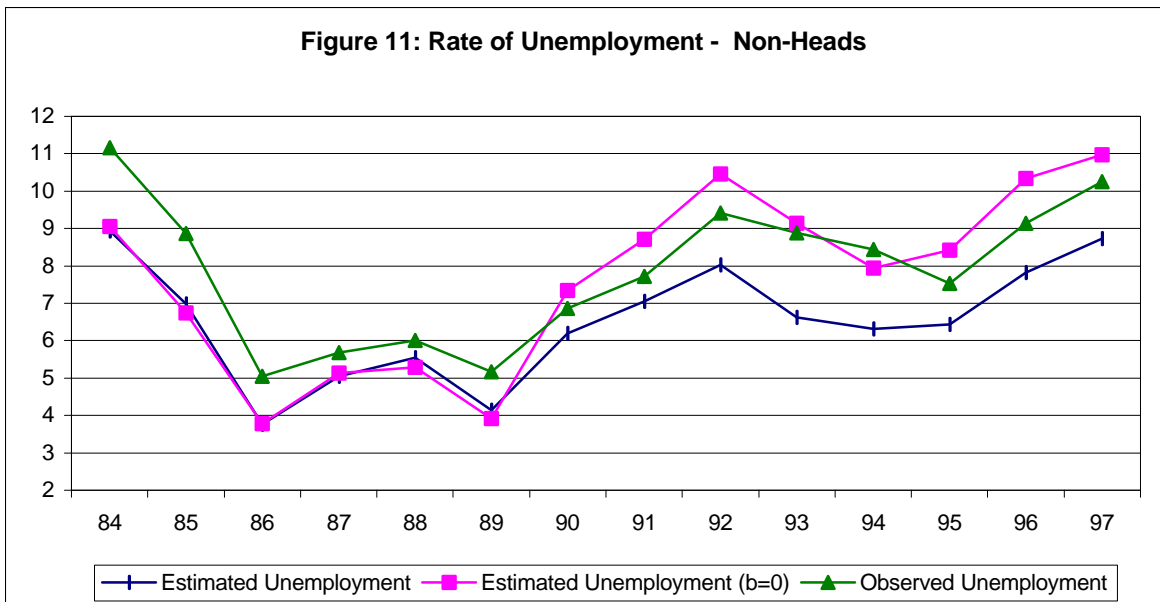
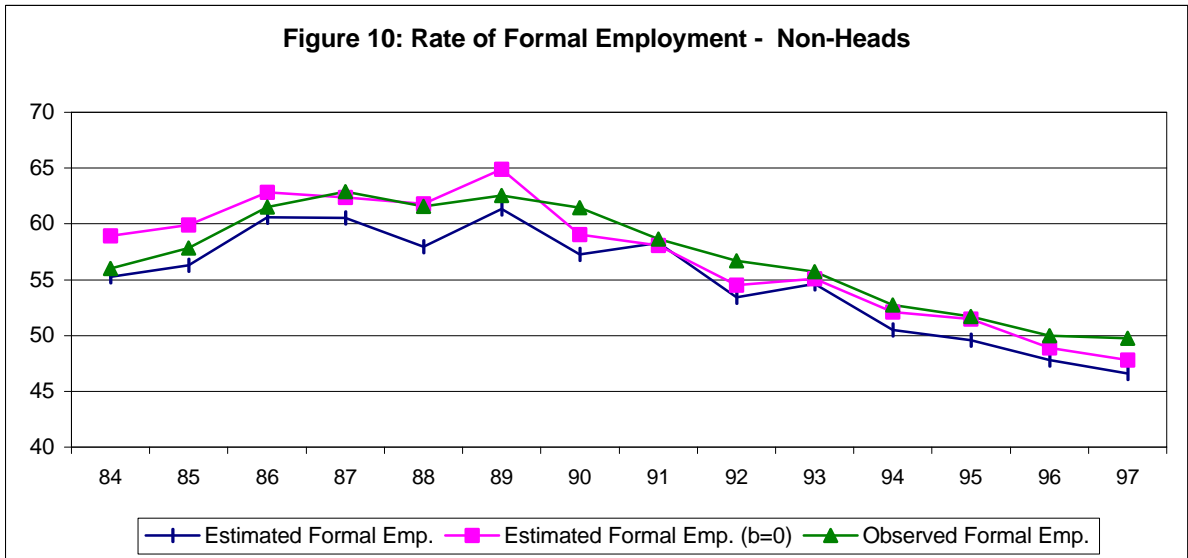


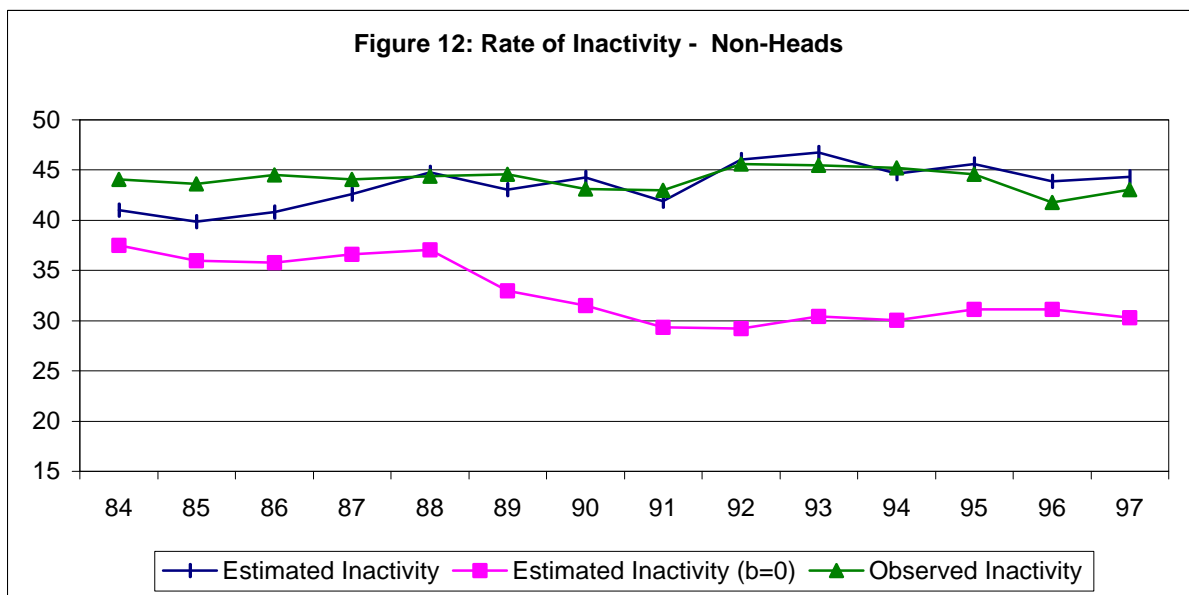


5.4 The Impact of Unemployment Insurance on Non-Heads of Families

The above results suggest that the impact of unemployment insurance basically acts on the population of non-heads of families, which can also be seen in figures 10, 11 and 12. The impact of unemployment insurance on the rate of formal employment was practically nonexistent. This result is not very different from the result obtained for the population as a whole. The qualitative results for the rates of unemployment and inactivity are more or less the same, but are much more intense, especially for the rate of inactivity. Using 1997 as a base, our simulations indicate that unemployment insurance increases the rate of inactivity for non-heads of families by 10 percentage points.

As mentioned before, this result could be due to the fact that the same benefit has a stronger affect on non-heads of families and that the level of benefits of non-heads of families are proportionally higher.





6. Final Considerations

This article investigates the impact of unemployment insurance on transitions in Brazil's labor market. More than 14 years after its implementation, there is solid evidence that unemployment insurance has become an institution with powerful effects that illustrate the functioning of the labor market. This is achieved not only by providing a greater sense of well being of the workforce, but also through its effects on occupational transitions addressed herein.

Our results do not support the hypothesis that unemployment insurance provides incentives for workers to take actions that lead to dismissal from their job in the formal sector. The impact of the replacement of the unemployed worker's income on the rate of formal employment was insignificant. This is in accordance with international evidence, where the search for a job in the formal sector is a way of assuring eligibility for unemployment insurance. However, the fact is that workers in many countries also adhere to other social security programs, which does occur in the case of Brazil.

Another surprising result was that unemployment insurance has a negative effect both on the rate and average duration of unemployment. This, however, does not occur because workers are unable to find a job in less time, but most probably because they join the ranks of the inactive with greater facility.

The positive effect of unemployment insurance on inactivity is without a doubt one of the most important results of this investigation. This could be because the benefits reduce efforts in the active search for employment, increasing the probability of an unemployed worker being classified as inactive. However, this result occurs basically among children and spouses, rather than among heads of families. Another important result of this paper is the fact that the impact of unemployment insurance occurs basically among non-heads of families.

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Appendix
Probabilities of Transitions between Occupational States (%)
1984-1997

Year	Puu	Puu (b=0)	Pun	Pun (b=0)	Puf	Puf (b=0)	Pui	Pui (b=0)
84	46.24	46.24	22.43	22.43	7.89	7.89	23.44	23.44
85	42.61	42.61	22.89	22.89	10.19	10.19	24.31	24.31
86	30.51	30.88	27.69	27.45	15.59	15.38	26.21	26.29
87	37.51	38.27	25.87	25.42	16.31	15.91	20.31	20.39
88	37.42	38.09	28.65	28.20	13.66	13.36	20.28	20.35
89	37.80	38.56	25.34	24.88	14.62	14.24	22.24	22.32
90	40.05	43.60	27.92	25.58	10.84	9.47	21.19	21.35
91	44.03	48.02	26.91	24.25	9.00	7.67	20.06	20.06
92	45.52	51.13	26.75	22.80	6.51	5.08	21.22	21.00
93	44.02	49.78	29.38	25.20	6.73	5.27	19.86	19.76
94	45.44	49.35	26.20	23.27	5.77	4.91	22.59	22.47
95	41.60	45.19	30.84	28.05	7.26	6.35	20.29	20.41
96	46.94	50.29	27.47	24.89	5.50	4.80	20.09	20.01
97	47.89	51.15	27.44	24.89	4.70	4.11	19.97	19.86

Year	Pnu	Pnu (b=0)	Pnn	Pnn (b=0)	Pnf	Pnf (b=0)	Pni	Pni (b=0)
84	8.27	8.27	79.63	79.63	2.50	2.50	9.60	9.60
85	7.11	7.11	80.63	80.63	2.70	2.70	9.56	9.56
86	4.61	4.83	80.98	80.50	4.64	4.71	9.77	9.96
87	5.00	5.43	81.41	80.55	4.68	4.79	8.92	9.24
88	5.25	5.65	80.55	79.75	4.17	4.25	10.03	10.34
89	4.19	4.57	81.73	80.88	4.87	4.99	9.21	9.55
90	6.08	8.96	80.56	75.71	4.20	4.64	9.16	10.68
91	7.17	11.04	79.26	73.27	3.71	4.10	9.86	11.59
92	6.86	12.91	81.50	72.65	2.71	3.13	8.94	11.31
93	5.40	10.47	82.53	74.33	3.25	3.85	8.81	11.36
94	5.61	8.66	82.17	76.94	2.60	2.93	9.62	11.47
95	5.79	8.54	80.43	75.57	2.87	3.17	10.91	12.72
96	6.84	9.84	80.81	76.07	2.27	2.49	10.08	11.61
97	7.56	10.82	81.01	76.19	2.07	2.26	9.36	10.73

Year	Pfu	Pfu (b=0)	Pfn	Pfn (b=0)	Pff	Pff (b=0)	Pfi	Pfi (b=0)
84	1.23	1.23	2.05	2.05	90.83	90.83	5.88	5.88
85	1.23	1.23	2.00	2.00	90.54	90.54	6.23	6.23
86	0.98	0.99	2.44	2.46	89.71	89.76	6.86	6.78
87	1.19	1.21	2.63	2.67	89.46	89.54	6.72	6.58
88	1.29	1.31	2.56	2.60	89.61	89.68	6.53	6.41
89	1.01	1.04	2.54	2.58	89.87	89.95	6.57	6.43
90	1.45	1.59	2.67	2.84	89.44	89.75	6.44	5.82
91	1.35	1.50	2.45	2.62	89.99	90.33	6.21	5.55
92	1.35	1.57	2.27	2.51	89.32	89.93	7.06	5.99
93	1.08	1.26	2.76	3.05	88.34	89.05	7.82	6.65
94	1.13	1.26	2.34	2.52	89.48	89.91	7.06	6.31
95	1.36	1.52	2.95	3.17	88.06	88.42	7.63	6.89
96	1.22	1.35	2.69	2.88	88.51	88.87	7.58	6.89
97	0.94	1.04	2.26	2.42	88.16	88.64	8.65	7.90

Year	Piu	Piu (b=0)	Pin	Pin (b=0)	Pif	Pif (b=0)	Pii	Pii (b=0)
84	3.86	3.86	9.33	9.33	9.33	9.33	77.49	77.49
85	2.58	2.58	8.40	8.40	10.36	10.36	78.67	78.67
86	1.40	1.43	9.36	9.02	12.26	12.15	76.98	77.40
87	1.80	1.88	9.41	8.79	11.41	11.22	77.38	78.10
88	1.76	1.83	9.90	9.30	11.65	11.48	76.70	77.39
89	1.54	1.61	9.09	8.49	11.80	11.60	77.57	78.31
90	2.12	2.52	8.69	6.36	10.59	9.69	78.61	81.43
91	2.37	2.86	8.93	6.36	9.78	8.85	78.92	81.93
92	2.43	3.17	9.40	5.77	9.62	8.29	78.55	82.77
93	2.40	3.13	9.04	5.54	10.55	9.08	78.02	82.24
94	1.90	2.33	8.50	5.72	8.89	8.01	80.72	83.93
95	1.99	2.44	9.67	6.79	9.51	8.72	78.83	82.05
96	2.40	2.90	8.86	6.32	8.39	7.69	80.35	83.09
97	2.68	3.22	8.31	5.96	8.26	7.56	80.75	83.26

São Paulo, May 2000.