SUCCESSES AND FAILURES OF THE LABOR MARKET REFORM IN COLOMBIA[•]

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I. INTRODUCTION

Near the end of 2002, Colombia's Congress approved Law 789, better known as the labor market reform. Regardless of the fact that the reform has not yet completed two years of operation, and many of the changes in the labor legislation are expected to have long term effects, this study intends to measure its impact on labor markets using the only variable that, theoretically, does not have ambiguous effects: the duration of unemployment[1] (Bentolila and Bertola, 1990). However, this is not the only key variable that can be used to establish the net effect on employment and unemployment. Hence, this study also analyzes the effects of Colombia's labor reform on the duration of unemployment. In short, we approximate the measurement problem by studying the effects on labor rotation and the unemployment-employment-unemployment flows. In this analysis, it is even more interesting to explore this rotation among different economic sectors and different groups of the population. This is accomplished by using different econometrical techniques and by differentiating the population according to age, educational attainment and economic sector.

Colombia's labor reform contains a component of Social Protection mechanisms (unemployment subsidies, training, employment formalization, and the like), and another of labor flexibility (greater flexibility in the length of workdays, reduction of firing costs and changes in the training contract). This last flexibility component modified the labor legislation and can be understood as an attempt to unprotect workforce stability in exchange of increased hiring. However, the net effects on the economy as a whole are not straightforward. For example, the reduction of firing costs produces, in the short term, the destruction of unproductive jobs that only existed because of the high firing costs that companies had to pay. Once these costs fall,

[1] A greater rotation of the unemployed may also have positive effects on income distribution, as long as the young and unqualified are benefited the most by the changes in legislation.

companies are expected to dismiss these workers and hire more productive (better qualified) ones; this decreases the average duration of both unemployment and employment, and increases the economy's productivity. Because of this, Colombia's workforce, represented by labor unions, opposed to the reform; meanwhile, the unemployed favored it although, due to their high disorganization, through a weak voice. Note that the net effect over employment is ambiguous because the firm's decisions imply the creation and destruction of jobs. Nonetheless, there is no ambiguity about the impacts on the duration of unemployment and on productivity: the first falls and the second rises. The effects on the duration of employment are not clear either. The firms will increase hiring, decreasing the average duration of employment; however, Colombia's labor reform included a transition period that did not apply for workers with more than ten years of tenure. Therefore, in the short term the average duration of employment may increase against workers with tenure close to ten years. An expected secondary effect, important only because of its temporality, is the increase in wages: the rise in job creation results in a rise in wages (Davis, Haltiwanger and Schuh, 1996) which is consistent with the greater productivity mentioned above.

Regarding the workday's grater flexibility introduced in the labor reform, we must mention that this component was not included in the first labor reform project presented to Colombia's Congress. In exchange, the project proposed a reduction of the overcharge for daily and nightly overtime. During the discussions in Congress this proposal was "negotiated" and this, in our concept, was one of the most correct aspects of the labor reform. The reduction of overtime charges that was initially proposed would not have increased employment, but rather the number of hours worked per person; in contrast, the increase in the length of the workday without overcharge gave firms a mechanism to increase production by establishing two shifts without

overcharge. In comparative statistics, this leads to an improvement in income distribution, because the increase in working hours can be distributed among more people.

Intuitively, the changes in Colombia's labor market legislation should not have important effects on employment during the lower part of the economic cycle, because firms do not increase job creation unless they face an increase in demand; during the lower parts of the cycle there would simply be a redistribution of jobs. However, during an expansion phase it would be counterintuitive to think that the entrepreneur would not take advantage of the greater flexibility provided by the labor reform and of the change in labor-capital relative prices. Even more, the moment in which the reform was promoted was exceptionally positive: since the economy's unemployment rate was lower than the natural unemployment rate, great deals of resources were unemployed; therefore, the impact of the expansive fiscal policy that took place between 2002 and 2003 did not have inflationary effects. As a consequence of the expansion and greater flexibility, employment increased 5.2% during 2003 and GDP increased 3.9%.

The fact that the economy was in a different phase of the economic cycle before and after the reform cause difficulties in the measurement of the impact on the key labor market variables (duration of employment and unemployment). In order to solve this problem and isolate the effect of the economic cycle on these key variables, we use the differences-in-differences methodology.

This study finds that Colombia's labor reform had positive effects on the duration of employment, on the formalization of the economy and on the duration of employment in the most dynamic sectors. In relative terms, the young and unqualified were benefited the most by the impact on the duration of unemployment; in contrast, there were no significant differences on the effects on the duration of employment

among the various groups of the population. Therefore, we conclude that Colombia's labor reform achieved several of its objectives, although no conclusions can be made on its performance during times of recession. It has been demonstrated that the labor reform that was developed in the nineties had a favorable performance during the expansive phase of the cycle (Kulger, 2000) but could not prevent the disasters that came about with Colombia's recessive phase in the late nineties.

This study is divided into seven sections. Section II describes the labor market situation of the late nineties, which compelled Colombia's authorities to develop the labor reform. Section III section presents the main mechanisms that were introduced in Colombia's labor reform to increase labor market flexibility. The fourth section explains the methodology that was used to estimate the effects of the labor reform on the key variables of the labor market. Section V describes the data used in the estimation and the way in which different modules of Colombia's household surveys were combined to use the proposed methodology adequately. Section VI presents the results and Section VII summarizes and concludes.

II. SITUATION OF COLOMBIA'S LABOR MARKET BEFORE THE LABOR REFORM (MID TO LATE NINETIES)

In early 1995 the unemployment rate of Colombia's seven main cities was 7%. Throughout 1996 the first symptoms of recession became visible (two consecutive quarters with negative GDP growth) and spread rapidly onto the labor market. During the following years strong adjustments in aggregate expenditure took place, and in 1998 the real interest rate had to be increased in order to defend Colombia's crawling band

exchange rate system[2]. As a result, Colombia's recession grew deeper between 1998 and 1999, and GDP growth fell to its historic lowest: -4.5%. In early 1999, the minimum wage was adjusted by 16% anticipating a very similar level of inflation. However, and as a consequence of the recession itself, the inflation rate during 1999 was 9.3%; in other words, the minimum wage increased approximately 7% in real terms during the deepest recession of Colombia's history. Given the inflexibility of the labor market, especially regarding nominal wages, companies were forced to dismiss their workers and the labor marked adjusted through quantities (as opposed to prices). By 1999 the unemployment rate had tripled (Annex 1) and the poverty level had increased by 10 percentage points (Nuñez and Ramirez, 2002).

Once the recession was over, people expected the unemployment rate fall back to the pre-recession levels; however, the unemployment rate showed clear symptoms of hysteresis (Sanchez and Salas, 2002). Companies had learned to produce using a higher capital/labor relation, which was equivalent to a change in the production function. Thus, the employment-GDP elasticity decreased dramatically (Nuñez, 2002) and only recovered after the labor market reform of 2002 (López, Rhenals and Castaño, 2004).

As mentioned earlier, the situation of the labor market had important effects on poverty levels. As expected, the unemployment rate increased – and remained high – especially among the youngest (35% unemployment) and least qualified (24% unemployment) of the population.

Facing this dramatic situation, Colombia's policy makers designed a labor reform that included elements to increase employment among the most vulnerable

[2] Banco de la República (1999) "Report from the Board of Directors of Colombia's Central Bank to Colombia's Congress" July 1999, Bogotá.

groups, and to dynamize the most labor intensive sectors. The following section presents a summary of the main instruments developed in the labor reform.

III. MAIN ELEMENTS OF COLOMBIA'S LABOR REFORM

Colombia's labor market reform consists of two main elements: 1) labor protection, and 2) labor flexibility. The first component, which is not analyzed in this study, includes elements to protect workers from the risk of unemployment; this represents an important progress in Colombia's labor legislation which provides formal workers with insurance against covariant shocks. The second component included changes in labor legislation, enclosed in the *Substantive Labor Code* (CST, for its acronym in Spanish). The main purpose of these changes was to make labor contracts more flexible, particularly regarding working shifts, firing costs and the apprenticeship contract. Each of these mechanisms is explained in detail below[3].

In the late nineties it became clear that some sectors needed more flexible working shift in order to increase both their production of goods and services and their employment. For example, Colombia's commerce sector does not have the usual office working shifts; on the contrary, it must adapt to the seasonality of sales, which are concentrated especially in weekends and in periods of increased consumption (for example at the end of the year). The services sector (including financial services) is not subject to the usual office working shift either. Last, the tariff advantages offered by the United States to Colombia under the Andean Trade Promotion and Drug Eradication Act – ATPDEA – in late 2002 required an increase in production and in the number of working hours in the industries where the preferential tariffs of ATPDEA were

[3] The changes in the CST that intended to give greater flexibility to labor relations are dealt with in Chapter VI of the labor reform.

concentrated. These three sectors, which concentrate three quarters of urban employment in Colombia and are the economy's most dynamic, needed greater flexibility in their shifts in order to increase employment.

For all these reasons, Colombia's labor reform extended the regular daytime workday from 6:00 a.m. to 10:00 p.m.[4] (Article 26). With this change, Colombia caught up with neighboring countries, which had already moved towards a more flexible workday[5]. In the same direction, Article 51, an article of great potential to the commerce and services sectors, allowed for flexible daytime shifts which could be distributed during the week, with a minimum of 4 working hours per day and a maximum of 10 working hours per day. The exact number of hours worked by each employee is negotiated between employer and employee with the purpose of completing the weekly working shift of 48 hours. This new working shift has been widely used by restaurants and hotels, concentrating the most hours towards weekends.

A second mechanism, which was not expected to have a large impact in the short term, was the change in compensation costs of dismissing workers unilaterally (Article 28 of the labor reform). Graph 1 presents the changes in compensation costs according to the tenure of the worker. In the past, and as a result of the rise in firing costs of at the tenth year of tenure, companies dismissed their workers before they reached the ten year tenure, regardless of the effects on productivity[6]. In fact, there is evidence that, after the labor reform, this high worker rotation at the ten year tenure declined sharply (Figure 1); nevertheless, the true effects of the reduction in firing costs can only be verified in the medium and long term. Using the methodology described in Núñez and Sanchez (1999), the government has estimated that this mechanism had an impact of nearly

[4] Before the reform the usual daytime working shift was from 6:00 a.m. to 6:00 p.m.
[5] Nowadays, only Panama continues to have a workday from 6:00 a.m. to 6:00 p.m.
[6] This in turn reflects on the aggregate economy.

40,000 jobs during the first year of the reform. Still, to estimate the isolated impact of this mechanism is totally impossible.

Last, and given the evident deterioration of the unemployment rates for the youngest and least unqualified of workers, the apprenticeship contract was modified (Articles 30 to 39). This contract involves companies in the training process of apprentices, both in the theoretical and practical stages of training, sponsoring them with the monthly maintenance of apprentices during an "educational" phase in which they acquire knowledge for their future occupation, and a "practical" phase.

The apprenticeship contract had two main changes. On the one hand, its costs were reduced by about 44%, by reducing the wage paid to apprentices to 50% of the legal minimum wage during the educational phase and to 75% of the minimum wage during the practical phase, and by not forcing the employer to make pensions payments. On the other hand, the apprenticeship contract became an obligation for companies with more than 15 employees and its nature ceases to be labor related; therefore, the apprentices would not receive benefits other that payments to the health and professional risks systems. The impact of these changes on employment can be calculated directly because Colombia's National Training Agency (SENA) registers all apprentices who start working in a company on an annual basis. There is consensus that this has been one of the most positive mechanisms of the labor reform regarding employment generation.

All of the mechanisms described above were expected to have effects not only on employment generation but also on the quality of employment (Articles 15, 19 and 21). Some of the mechanisms were aimed at formalizing employment, combined with other changes considered in the pension reform and the professional risk regime[7].

[7] After the reform, the affiliation to the Family Compensation Associations (*Cajas de Compensación Familiar)* increased by 378,000 workers. The increase in the Professional Risk Regime amounted to

Furthermore, Gaviria (2004) found that Colombia's labor reform "decreased shortage-of-hour underemployment".

IV. METHODOLOGY

Prior to the 2002 labor reform, the labor market had a lower entrance flow from unemployment to employment (Fe) than the exit flow from employment to unemployment (Fs). This situation is described in Figure 1.

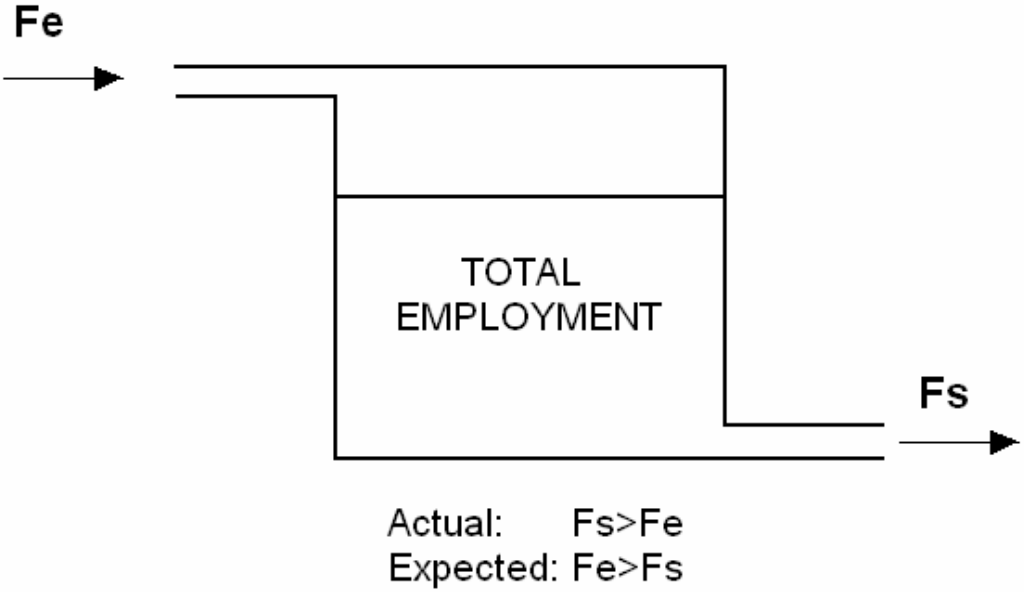


Figure 1.

Given that the labor marked was facing a situation in which *Fs>Fe*, the employment stock was falling while the number of unemployed was rising. The changes included in the labor reform were expected to stop this trend, giving way to a situation in which *Fe>Fs*. One way to prove if there was, in fact, a change in the trend is to use duration models. Specifically, if the duration of unemployment decreases, the flow of

603,000 workers, and in the Contributive Health Regime affiliation rose by 483,000 workers. When comparing this data with the increase in employment (around 850,000 new jobs), and taking into account that the informal sector is about 75% of total employment, it is clear that a favorable formalization of employment is appreciated. Furthermore, underemployment fell from 34.8% to 32.6% between 2002 and 2004.

Fe rises, and if the duration of employment increases, the flow of *Fs* falls. In this case, what we want to find out is whether the changes in the duration of unemployment and employment can be attributed to the labor reform. However, it is not clear if the labor reform includes mechanisms which would cause *Fs* to decrease in the short term; in fact, there is a possibility that the reform would cause *Fs* to increase, or that it would only cause a decrease for certain sectors or groups pf people. The methodology we propose intends uses the duration of unemployment and employment to establish exactly which economic sectors or groups of people had the greatest change in *Fe* and *Fs*.

In Colombia, the hypothesis of dual markets can be clearly pointed out (Saint-Paul, 1996). Under this hypothesis, two labor markets exist in the economy and function as dual markets: in the first, workers benefit from high wages and labor protection (formal sector)[8]; in the second, people work independently, without protection or social security (informal sector). Nevertheless, the informal sector offers a more flexible regime for the operation of businesses involving more experienced and entrepreneurial workers. Given its high flexibility in wages and regulation, one would the labor reform to have no effects on the informal sector. Furthermore, this type of reform is usually developed in order to formalize the labor market. In fact, given that the size of the informal sector was increasing rapidly, and reached 74% of employment (Núñez and Espinosa, 2004), "the mechanisms carried out in the reforms were aimed at achieving two purposes: to increase job generation in the formal sector and to provide additional protection for workers"[9].

Whatever the effect of the labor reform, the existence of these two clearly differentiated sectors implies that impacts were expected only on the formal sector,

[8] This is a legally regulated sector and there is a minimum wage for its workers. The unemployment generated by this rigidity can also explain the existence of dual markets.
[9] Statement in Law 789, pp. 27

since the informal sector is not governed by the labor regulation and, as a matter of fact, neither a minimum wage nor payroll taxes exist. If in fact the labor reform only had impacts on the formal sector, the problem of measuring its impacts becomes a problem of finding adequate definitions of formal and informal sectors. However, this is not only a problem of theoretical definitions, but rather of the type of identification that we can achieve with the data in Colombia's household surveys. For the duration of unemployment, we used the occupational position that the unemployed wanted to get a job in, and the occupational position that the recently employed person had found a job in. We used employee and blue-collar workers as the definition for the formal sector, and domestic workers, independent workers, entrepreneurs and family workers without remuneration as the definition for informal sector. Although this definition is not very common, our main interest is to measure if the flow from unemployment to the formal sector (employee or blue-collar worker) has increased, because these were precisely the two occupational positions in which no increases had previously occurred.

For the duration of employment we have much more precise information to identify the sectors, mainly because Colombia's household surveys document the sector and the size of the company in which the employee was hired. The methodology assumes that there are some sectors in which employment is more formal than in others, and that specific mechanisms in the labor reform could have benefited some sectors more than others (see Section II). In addition, it assumes that employment generation in small firms takes place through the creation of new firms and not through increases in each firm's working force. Thus, the empirical estimations use different approaches of what could be considered as the formal sector (sector benefited by the reform). This definition was reinforced with the help of 15 national experts who were asked about the economic sectors and firm size upon which they expected the labor reform to have

greater impacts; 75% of the experts stated that the labor reform would have greater impacts in the commerce, services and industry sectors, and 75% of the experts expected greater impacts in medium and large-sized companies.

The information to estimate the models (see Section V) uses the informality modules from Colombia's household surveys, developed by Colombia's National Administrative Statistics Department (DANE) in the second quarter of each year. We use the surveys from 2002 and 2004 as pre and post-reform periods. Between these two years, employment increased by 3.6%, which is equivalent to the creation of more than 700,000 new jobs. In this sense, the estimation of the impact of the labor reform becomes more complex because the economy was going through different phases of the economic cycle before and after the reform (GDP growth rose from 2.3% in the second quarter of 2002 to 4.3% in the second quarter of 2004); therefore, it is not simple to isolate the effects of the economy's growth and the effects of the labor reform on employment[10].

The analysis strategy is based on the difference-in-difference estimator used by Hamermesh and Trejo (1998) for similar purposes. Given a group *G1* affected by the reform and a group *G2* whose impacts are close to zero, the difference-in-difference estimator Δ^2 contains the effects of the labor reform over a relevant variable *Y*:

$$\Delta^2 = (Y_{G1}^{2004} - Y_{G1}^{2002}) - (Y_{G2}^{2004} - Y_{G2}^{2002}) \quad (1)$$

The first term in the right hand side of the equation measures the change in the relevant variable *Y* that results from all the factors, including the labor reform. The second term measures the change in variable *Y* on group *G2*, which by definition is not affected by the labor reform, even though it is affected by all the other factors. Consequently, when

[10] However, we must take into account that the occupation rate for both years is very similar (Annex 2).

the effects on *G2* are subtracted from the effects on *G1*, the net effect of the reform on *G1* is isolated, solving the problem of the economic cycle.

The econometric method to estimate Δ^2 assumes that the analysis variable Y follows a function $g(\bullet)$ such that:

$$Y = g(\beta_1 T, \beta_2 G, \beta_3 TG) \quad (2)$$

where T and G are dichotomous variables that differentiate the post-reform period (T) and the affected group (G), and β_i are the parameters we wish to estimate. It can be easily demonstrated that $\Delta^2 = \beta_3$ (Card and Sullivan, 1988). As mentioned earlier, our analysis will concentrate on the duration of unemployment and the duration of employment. Therefore, Y is a continuous variable with the time spent searching for employment and with labor stability.

To identify the functional form of $g(\bullet)$ in equation (2) we follow the traditional methodology of duration models: 1) we use a Box-Cox transformation, which assumes proportional risk in the duration variable; 2) we verify the hypothesis of proportional risk; 3a) if the hypothesis is accepted, we obtain the functional form and the parameters of interest; 3b) if the hypothesis is rejected, we estimate parametric models; 4) among the models used, we choose the one that minimizes the Akaike Information Criterion (AIC), obtaining therefore the parameters of interest. These four steps resulted in a Weibull model with the following functional form:

$$h(Y \mid x_j) = h_0(Y) \exp(x_j \beta) \quad (3)$$

where

$$h_0(Y) = p Y^{p-1} \exp(a) \quad (4)$$

and β, p and a are the parameters we wish to estimate.

V. DATA

In order to estimate the parameters we use DANE's Continuous Household Survey for 2002 and 2004. The information on the duration of unemployment and the duration of employment is obtained using data from the second quarter of each year.

For the duration of unemployment, we combined two datasets: 1) duration of unemployment of the current unemployed and 2) duration of unemployment of the current employed before becoming employed. Given that the reform was fully implemented in April 2003 and that the second semester of 2004 is compared with the second semester of 2002, we must discard the information of people who began searching for a job before the full implementation of the labor reform in order to avoid confusing the two labor legislations (pre and post-reform). In other words, we use the information of unemployment flows a year prior to the survey (Y=0) to monitor the duration of unemployment up to the time of the survey (Y=12). While the first dataset (unemployment of the current unemployed) will have a duration of 1 year (Y=12), the second dataset (unemployment of the current employed before becoming employed) will have durations ranging from 1 to 11 months ($0<Y<12$). Consequently, the people who were unemployed at the time of the survey and who report durations of unemployment that are higher than 1 year are discarded; the same holds for the people who are employed at the time of the survey and who report unemployment and employment durations higher than 1 year. Thus we obtain the information for all the individuals who in the last year reported at least one period of unemployment. Note that for the employed we know the exact duration of unemployment, while for the unemployed the duration at the moment of the survey is censured (Figure 2).

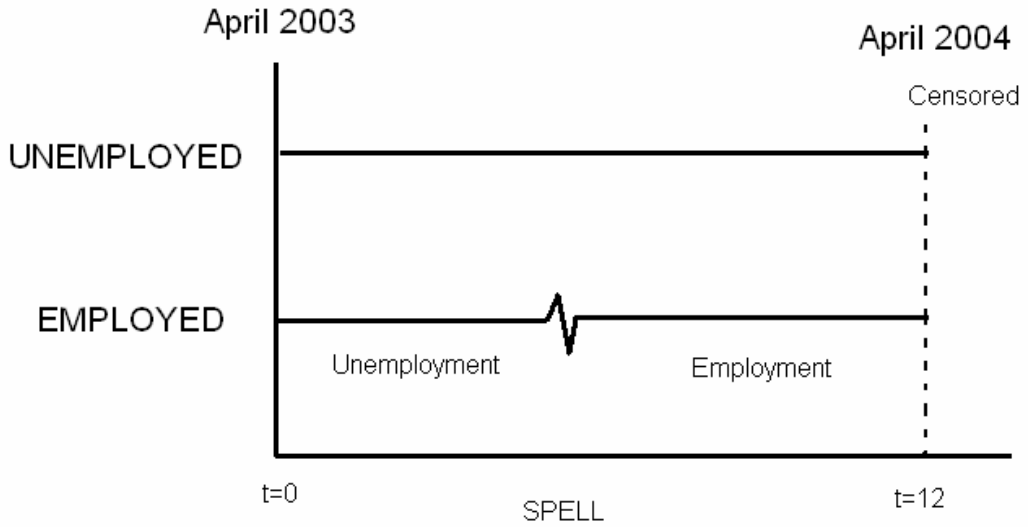


Figure 2

For the duration of employment we use data on individuals who have been working for a maximum of 20 years, since one of our objectives is to measure the impact of the reduction of firing costs without a fair cause on dismissals at the ten year tenure.

VI. RESULTS

A. Duration of Unemployment

Graphs 2a and 2b present some data on the duration of unemployment by age groups and educational attainment in 2002 and 2004. Except for workers older than 65, the duration of unemployment decreased significantly for all age groups between 2002 and 2004. Regarding educational attainment, there was a significant decrease in the duration of unemployment for less qualified workers (less tan 11 years of education) and for people with college education. For all other groups, the duration of unemployment increased.

In order to examine the effects of Colombia's 2002 labor reform on the labor market, we use the differences-in-differences methodology described in Section IV. First we analyze if the labor reform modified the duration of unemployment and the probability of changing from unemployment to employment in the formal sector. In order to do so, we estimate the survival curves for unemployment before and after the labor reform. As shown in Graph 3[11], the curves are different before and after the reform; furthermore, after the labor reform there is a reduction in the duration of unemployment.

Taking into account that the difference between the two survival curves is statistically significant[12], we estimate the effect of the labor reform on the duration of unemployment with the differences-in-differences methodology. Using equations (2) and (3), we estimated the following model:

$$h(Y \mid x_j) = h_0(Y) \exp(\beta_1 T + \beta_2 G + \beta_3 TG + \gamma X + \delta TX + \phi Z + \varphi \mu) \quad (4)$$

where X is a vector of individual control variables strongly related with the labor market (dummies for age and education), Z is a vector with control variables for the individual and his/her household, and μ is the regional unemployment rate faced by each individual; the objective of μ is to control by differences in the economic cycle before and after the labor reform[13].

The first difference (variables not multiplied by T in equation 4) establish the different probabilities of leaving unemployment among different groups of the population (vectors X and Z), of searching for a job in the formal or informal sector (variable G), and the effect of the unemployment rate on unemployment duration (variable μ). The second difference (variables multiplied by T in equation 4) shows the

[11] The y-axis presents the percentage of people who remain unemployed after a given number of months (x-axis). If the duration of unemployment falls, the curve will decrease rapidly.
[12] A log-rank test was used.
[13] The traditional models of duration of unemployment include only the vectors X and Z (see Hunt, 1999).

change in these variables between 2002 and 2004. The results are presented in Table 2. We present hazard rates, which show the probability to continue unemployed if changes occur in the variables: coefficients greater (less) than 1 indicate an increase (decrease) in the probability of leaving unemployment.

The first difference shows that the probability of leaving unemployment is higher (lower) for people younger (older) than 45, and for workers with low educational attainment, that is below 5 years of education. However, the second differences show that by 2004 the duration of unemployment had increased for people aged 18 to 24 and for workers with more than 12 years of education. This result can not be attributed to the labor reform; it is merely the difference between 2002 and 2004, including all of the changes that occurred between these two years, for each of the groups.

When comparing the situation of formal and informal workers (variable *G*), the first difference shows that an unemployed person has a probability of shifting from unemployment to the formal sector that is 43% lower than that of shifting to the informal sector. Since the labor reform is expected to have effects on the formal sector (see Section IV), the second difference (variable *TG)* shows that the reform increased the probability of shifting from unemployment to the formal sector by 5.8%. Without ambiguity, we can conclude that the reform brought about an improvement in the quality of employment by easing the entrance to the formal sector *vis-à-vis* the informal sector.

Graph 4a presents the survival curves estimated with the model of equation (4). As shown, when people search for a job in the formal sector, the probability of finding it is lower (greater duration of unemployment); this is also true for people searching for a job in 2002 in comparison to 2004. For a better understanding, Graph 4b shows a transversal cut at week 52 of the curves presented in Graph 4a. Three conclusions stand

out: 1) a year after beginning their search for a job, 17.5% of the people who searched in the informal sector, and 47% of those who searched in the formal sector, continued to be unemployed: a difference of 29 percentage points; 2) a year after beginning their search for a job, 34% of the people continued unemployed in 2004, compared to 44% in 2002: a difference of 10 percentage points; 3) after one year, a person who is looking for a job in the formal sector in 2004 has a probability of finding it that is 2 percentage points higher as compared with 2002. This last result is the short term effect of the labor reform.

A criticism to the methodology is that in 2004 the economy was in the growing phase of the GDP cycle, and thus some of these results may be overestimated. However, the employment rate between 2002 and 2004 only differed by 0.6 percentage points, reason why this criticism is not entirely valid (Annex 2). Nonetheless, we estimated the same exercise between 2001 and 2002, a period when the labor legislation had not been modified and the employment rate increased by 0.5 percentage points. If in this exercise the coefficient β_3 is again statistically significant, this methodology may be capturing events different from the labor reform. Fortunately, the test found a hazard rate of 0.9893 and a z of -0.23.

In Section I we mentioned the importance of discriminating the results depending on the characteristics of the individuals. Specifically, we would like to know if the labor reform benefited the young and unqualified to a greater extent. With this purpose, a dichotomous variable *M* is introduced in equation (4), which equals 1 if the individual is either young or unqualified:

$$h(Y \mid x_j) = h_0(Y) \exp(\beta_1 T + \beta_2 G + \beta_3 TG + \beta_4 M + \beta_5 TM + \beta_6 GM + \beta_7 TGM + \gamma X + \delta TX + \alpha MX + \phi TXM + \varphi \mu) \quad (5)$$

In this case we want to estimate the parameter associated to variable *TGM*; the triple difference estimator $\Delta^3 = \beta_7$ shows the impact of the labor reform on group *M*. Three different specifications are used to estimate equation (5). In the first specification *M* equals 1 for young people aged less than 20; in this case, vector *X* only includes dummies for educational attainment and vector *Z* from equation (4). The second specification is estimated for young people with ages less than 30. In the third specification *M* equals 1 for people with 6 to 15 years of education, who are precisely the people who could have benefited from the changes in the apprenticeship contract; in this case *X* only includes dummies for age.

The results indicate that the labor reform had positive effects on the youngest workers (when using the people younger than 20) and the least qualified workers, by increasing the probability of shifting from unemployment to formal employment by 4.7% for the young and by 6.4% for the least qualified (Table 2.1). This specification is more stable and significant in comparison to the double difference model presented in Table 2; this indicates that differentiating by groups may bring about a better performance in the estimation of the impacts of the labor reform in Colombia.

B. Duration of Employment

The second factor that is analyzed is labor stability, that is, the duration of employment. Table 1 presents the share of workers according to tenure. As shown, the share of the workers with shortest and longest tenures has increased, in detriment of workers with tenures between 13 months and 119 months (1 to 19 years). These changes can be explained by an increase in new appointments during the last years (workers with tenures shorter than 12 months) and by the decrease in dismissals at the 10 year tenure that were encouraged by the previous legislation (Graph 1).

Graphs 5a and 5b present some statistics for the duration of employment according to age groups and educational attainment in 2002 and 2004. Between 2002 and 2004 there was a reduction in the duration of unemployment for all age groups, with the exception of 12 to 17 year-old workers, and for all educational levels. In order to analyze if these reductions are significant we estimated the before and after the labor reform. The results, which are presented in Graph 6, show that the probability that an individual will remain in the same job after 5, 10 and 15 years is 46%, 26% and 12% respectively.

In the case of labor stability, the mechanisms developed in the labor ere aimed at increasing the dynamism of the services, industry and commerce, and financial services sector (SICF, for acronym in Spanish) though specific mechanisms that increased the flexibility of labor relations. Therefore, we estimated a differences-in-differences model using the workers of these four SICF economic sectors as a treatment group (group upon which positive impacts are expected), and the workers from all other sectors as the control group (upon which the reform is expected to be close to zero). Taking into account that the reform mechanisms were directed towards the formal sector, the data on workers from the informal sector was discarded. In this case, the formal sector is defined as the workers who are affiliated to the health and pensions systems and who are blue-collar workers or employees.

With the purpose of refining the identification of treatment and control groups, we estimated three different models; each of them changes the assumptions on the sector upon which the reform could have had an impact. In the first model we assume that the treatment group (G in equation 4) includes the four SICF sectors and the control group includes all the other sectors. In the second model the treatment group G includes large firms (those with more than 10 employees) from the SICF sectors, and the control

group includes small firms from the SICF sectors and all other firms (both large and small) from all of the other economic sectors. The third model only uses the sample from the SICF sectors, using the large firms as the treatment group *G*, and the small firms as the control group.

In this case, we would expect the mechanisms adopted in the labor reform to increase labor stability in group *G*, that is, to reduce the probability of leaving employment (hazard rates less than 1). The coefficients of variable *TG* for the three models, which measure the effects of the labor reform on changes in the probability of staying employed, are presented in Table 3. The second difference shows that the labor reform brought about increases in the duration of employment for the four SICF sector; furthermore, with the exception of the commerce sector in model 2, all of the coefficients are significant and the results are maintained regardless of the specification used for the treatment and control groups. This proves that the mechanisms of increased flexibility introduced in the labor relations increased the duration of employment for these four sectors (services, commerce, industry and financial services). As an example, for an individual working in the services sector, the reform reduced the probability of loosing his/her job by between 30% and 22%, according to the model used. In the financial services sector, this probability fell by approximately 24%.

Finally, we estimated the triple differences model from the equation (5). In this case the four sectors were combined to create one sector such that variable *G* equaled 1 if the worker belonged to the services, commerce, industry or financial services sectors; in addition, the same three specifications for vector *M* were used. On the one hand, the results confirm the impact that was found with the double differences model, but, on the other, we do not find differential effects by age group or educational level; in none of the three specifications are the results significant (Table 3.1). In this sense, it can be

concluded that the greater duration of employment in the SICF sectors did not favor the most vulnerable groups; in other words, all groups from the population who work in these four sectors were benefited in the same way. This result on the duration of the employment was expected because the reform contains mechanisms that may cancel each other out.

VII. SUMMARY AND CONLUSIONS

After briefly reviewing some of the theoretical arguments in favor and against of Colombia's labor reform, this study described the complex situation of Colombia's labor market during the nineties: high unemployment rates and an increase in informality. In this context, Colombia's authorities started looking for mechanisms to increase the flexibility of employment, which were later presented to and approved by the Colombian Congress.

The objective of this study is to measure the impact of Colombia's labor reform on the labor market by exploring the duration of unemployment and the duration of employment. One the one hand, we discriminate the effects on the flow from unemployment to employment between what occurs in the formal and the informal sectors. On the other, we discriminate the effects on the flow from employment to unemployment among what occurs in certain formal sectors, because it would not make sense to carry out this exercise in the informal sector.

In brief, the duration of unemployment fell sharply between 2002 and 2004. Part of this effect is the result of the labor reform that was implemented in April 2003. In the same direction, the probability of finding a job in the formal sector increased by nearly 6% as a consequence of the labor reform. Therefore, we can conclude that the changes in Colombia's labor legislation helped formalize the economy and improved the quality

of jobs. The facts speak for themselves: between 2002 and 2004 there was an important increase in social security though health, pensions and professional risk insurance, and a decrease in underemployment as a consequence of the labor reform (Gaviria, 2004). The impact of the reform is even larger on the young and unqualified workers; this can lead to positive consequences for income distribution.

On the other hand, the duration of employment increased precisely in those sectors where large impacts of the reform were expected; it is likely that these effects will increase in the long run (Graph 6). The largest impacts took place in the services and financial services sectors (the probability of dismissal fell by nearly 25% with respect to the other sectors), while in commerce and industry sectors the effects can not be ignored: the probability of dismissal decreased by nearly 10%. Nevertheless, the most vulnerable groups did not receive greater benefits from these effects.

It is clear that Colombia's labor reform was favorable regarding employment creation. However, the reform still needs to be tested in times of recession: the labor legislation which held during the late nineties proved to be a failure, and it is still not clear whether the current labor legislation will work any better during an economic collapse. Evidently, nominal wages are downward rigid and that in the presence of another recession the adjustments in employment will once again be made by quantities (Maloney and Nuñez, 2004). The question on how to provide greater flexibility to these adjustments remains.

As for policy recommendations, the design of the Social Protection System, which was incorporated in the reform, must continue. Likewise, Colombia's National Training Agency (*SENA*) must move forward in its reforms, not only to improve the quality of the training services, but also to introduce competition through the National Job Training System (*Sistema Nacional de Formación para el Trabajo*). Without

competition, the training system will not viable: *SENA* is nowadays both a provider of training services, and a decision maker for the training system. Furthermore, the Labor Intermediation System (*Sistema de Intermediación Laboral*) must facilitate a further reduction of the duration of unemployment by using efficient and effective information systems for the insertion of the unemployed to the labor market.

With regards to the Direct Employment Program (*Programa de Empleo Directo – PADE*), contemplated in both the 2002 labor reform and in Colombia's National Development Plan, some problems that arise inside the government itself (in the Peace Investment Fund – FIP – and the Ministry of Social Protection – MPS), and with multilateral organizations, have not been solved. In this sense, one must take into account that the current design of the program is inadequate because the subsidy is very low and, consequently, the demand for labor will not increase among entrepreneurs.

Finally, and regarding Article 46 of the labor reform (which forces Colombia's Government to modify or annul the instruments that have not had any effects on the labor market), the articles analyzed in this paper – that is articles 26, 28 and 51 – have had the expected effects on labor indicators, and there is no doubt about their effectiveness. Concerning the articles that relate to the apprenticeship contract, we recommend looking into Gaviria (2004). Undoubtedly, there will always be room for further labor flexibility in the globalized world, and in this sense we must start thinking about mechanisms to increase nominal wage flexibility.

Bibliography

Bentolila, S. and G. Bertola (1990), "Firing costs and labor demand: How bad is Eurosclerosis?" **Review of Economic Studies** 57, 381-402

Card, D. and D. Sullivan (1988), "Measuring the Effect of Subsidized Training Programas on Movements In and Out of Employment" **Econometric**, May 1988, 56(3), pp. 479-530.

Davis, S., J. Haltiwanger and S. Schuh (1996), **Job Creation and Destruction**. Cambridge MA: MIT Press

Gaviria A. (2004), "Ley 789 de 2002: ¿funcionó o no?" **Documentos CEDE** No. 45, CEDE, Universidad de los Andes

Hamermesh D. and S Trejo (1998), "Demand for Hours of Labor: Direct Evidence from California" **The Review of Economics and Statistics**, 82(1), February

Hunt J. (1999), "Determinants of non-employment and unemployment durations in East Germany" **NBER Working Paper** No. 7128

Kigler, A. (2000), "The Incidence of Job Security Regulations on Labor Market Flexibility and Compliance in Colombia: Evidence from the 1990 Reform" **Research Network Working Paper** No. R-393: IADB

López H., R Rhenals and E. Castaño (2004) "Impacto de la reforma laboral sobre la generación y calidad del empleo" **Mimeo**, CIDE, Medellín

Maloney, W. (2001), "Informality Revisited" **Mimeo**, The World Bank, Washington, DC.

Maloney, W. and J. Nuñez (2004), "Measuring the Impact of Minimum Wages: Evidence from Latin America", in Heckman J.J. and C. Pages, **Law and Employment.** NBER, The University of Chicago Press.

Núñez, J. (2001), "La Demanda Laboral en Colombia" **Mimeo**, CEPAL, Bogotá

Núñez, J. and S. Espinosa (2004), "Asistencia Social en Colombia: diagnóstico y propuesta" **Mimeo**, IADB. Washington DC.

Núñez, J. and J. Ramírez (2002), "Determinantes de la pobreza en Colombia. Años recientes" **Serie Estudios y Perspectivas**, CEPAL, Bogotá, No. 1

Núñez, J. and F. Sanchez (1999), "Impacto de la Propuesta de Reforma Laboral" **Mimeo**, CEDE, Universidad de los Andes

Saint-Paul, G. (1996), **Dual Labor Markets**. Cambridge MA: MIT Press

Sánchez, F. and L. Salas (2002), "Histéresis en el desempleo colombiano" **Mimeo,** CEDE, Universidad de los Andes, Bogotá

Table 1. Participation of the workers according to tenure

	DURATION OF EMPLOYMENT (MONTHS)			
YEAR	<=12	>12 y <60	>=60 y <120	>=120
2002	22.9%	32.1%	22.3%	22.7%
2003	23.4%	31.4%	21.8%	23.3%
2004	25.5%	29.7%	21.4%	23.5%

Source: DANE, Continuous Household Survey

Table 2. (Hazard Rates) DURATION OF UNEMPLOYMENT MODEL

Variables		First Difference		Second Difference	
Age 12_17	(X1)	0.8988		0.9116	
Age 18_24	(X2)	1.3916	***	0.8375	***
Age 25_34	(X3)	1.7820	***	0.8786	
Age 35_44	(X4)	1.5642	***	0.8687	
Age 55_64	(X5)	0.7254	***	1.0069	
Age 65+	(X6)	0.5114	***	1.0702	
Education _5	(X7)	1.2603	***	0.9264	
Education 6_10	(X8)	1.0044		1.0139	
Education 11	(X9)	0.9519		0.9172	
Education 12_15	(X10)	0.9743		0.7895	***
Formal Sector	(G)	0.4340	***	1.0580	*
After	(T)	1.3177	***		
Unemployment rate	(u)	0.9325	***		
Sex	(Z1)	1.8623	***		
Single		0.7476	***		
Children 0-5	(Z3)	1.0187	**		
Children 6-11	(Z4)	0.9702	***		

Levels of statistical significance: *** 99%, ** 95%, * 90%

Table 2.1 Triple Differences Model

	Hazard Rate	z- value
Young <20 years		
Double Difference	1.0725	2.06
Triple Difference	1.0471	1.67
Young <30 years		
Double Difference	1.0698	1.94
Triple Difference	1.0166	0.72
Unqualified (6-15)		
Double Difference	1.0702	2.21
Triple Difference	1.0635	1.99

Table 3. Duration of Employment according to sector *

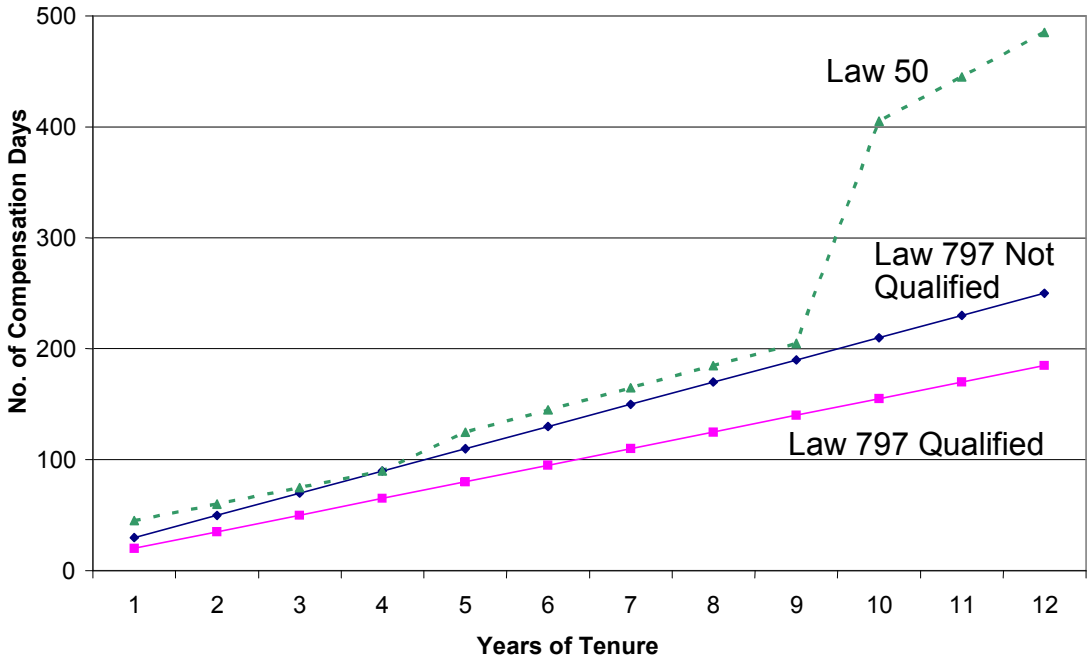
	Model 1	Model 2	Model 3
Services	0.7769	0.6939	0.7090
	(-9.60)	(-19.53)	(-16.68)
Commerce	0.8256	0.9707	NA
	(-6.06)	(-1.44)	
Industry	0.8520	0.9032	0.9320
	(-6.04)	(-5.20)	(-3.39)
Financial Sect.	0.7652	0.7575	0.7707
	(-4.61)	(-8.09)	(-7.39)

* z-value in parenthesis

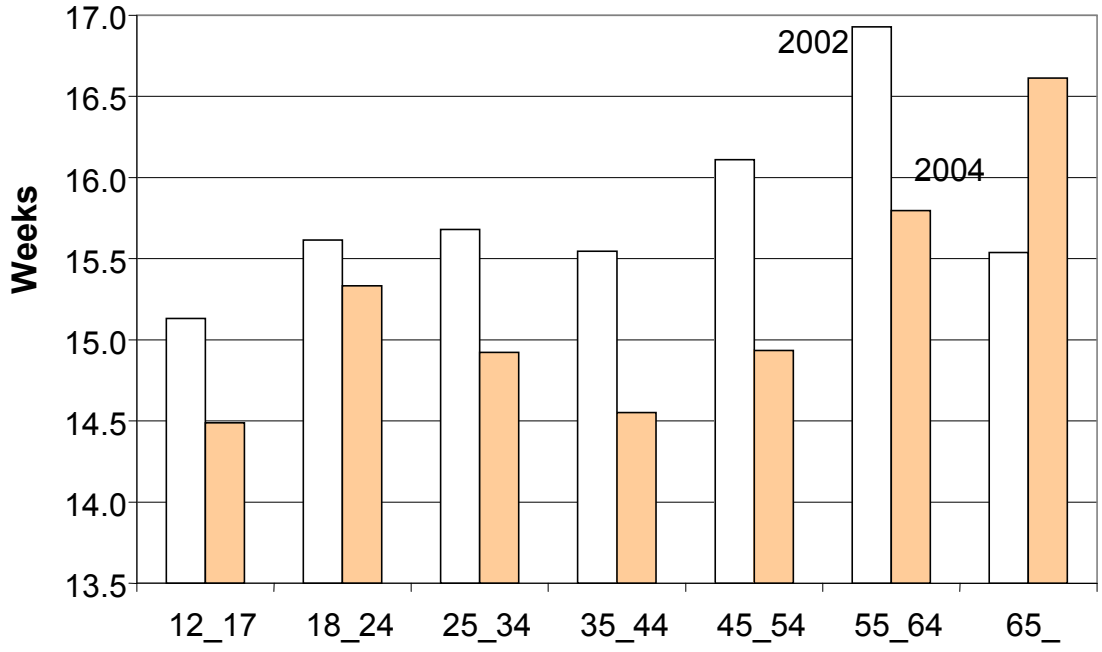
Table 3.1 Triple Differences Model

	Hazard Rate	z- value
Young <20 years		
Double Difference	0.7957	-10.83
Triple Difference	0.9911	-0.04
Young <30 years		
Double Difference	0.7891	-9.24
Triple Difference	1.0599	1.31
Unqualified (6-15)		
Double Difference	0.7900	-6.69
Triple Difference	1.0272	0.61

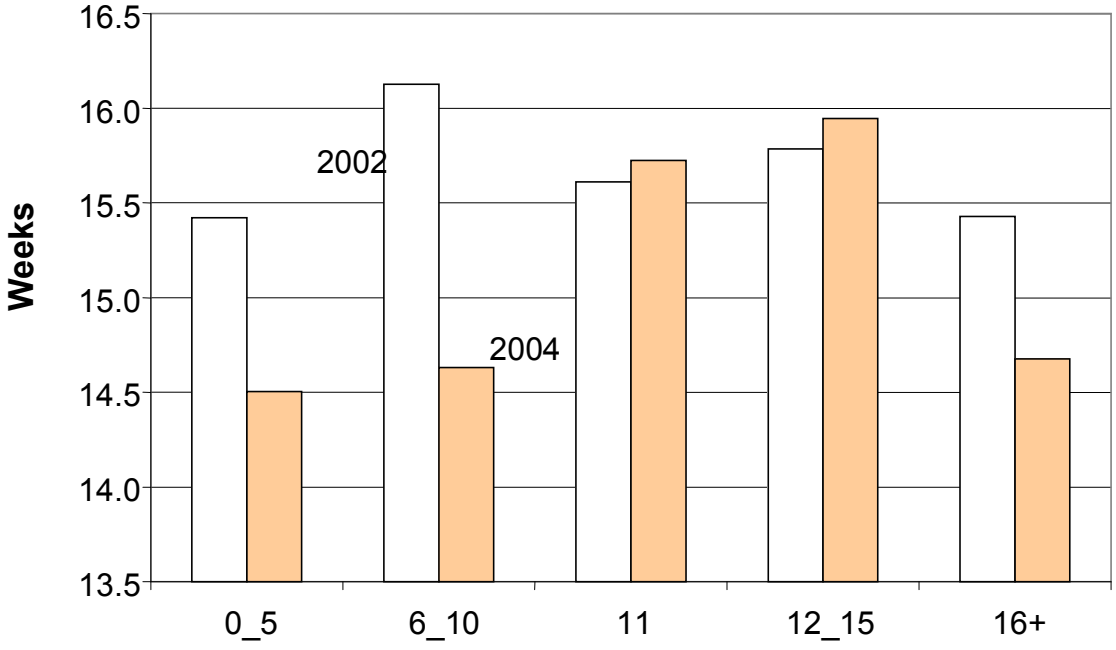
Graph 1. Compensation Table for dismissal without just cause



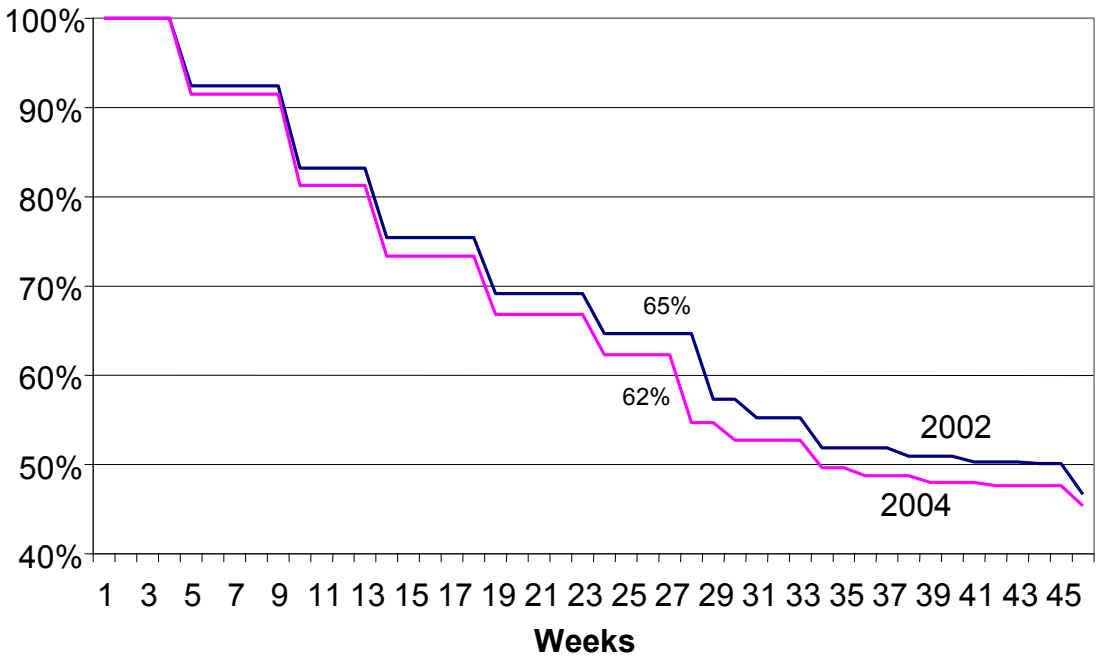
Graph 2a. Duration of Unemployment by Age



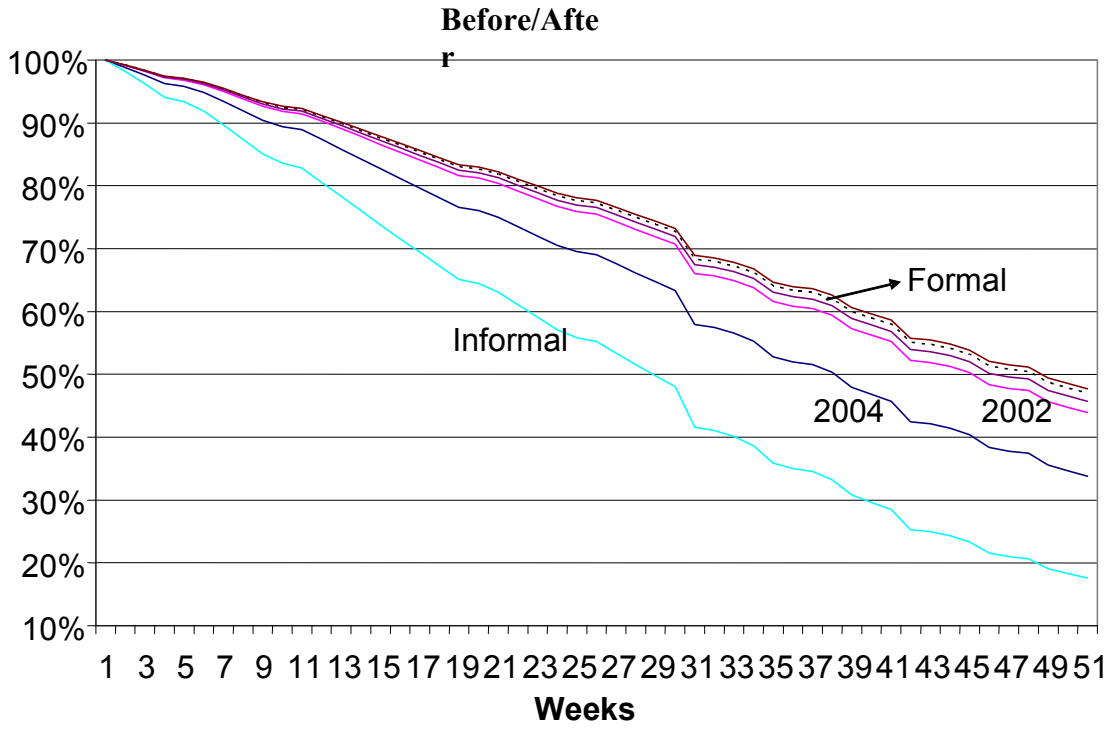
Graph 2b. Duration of Unemployment by Education



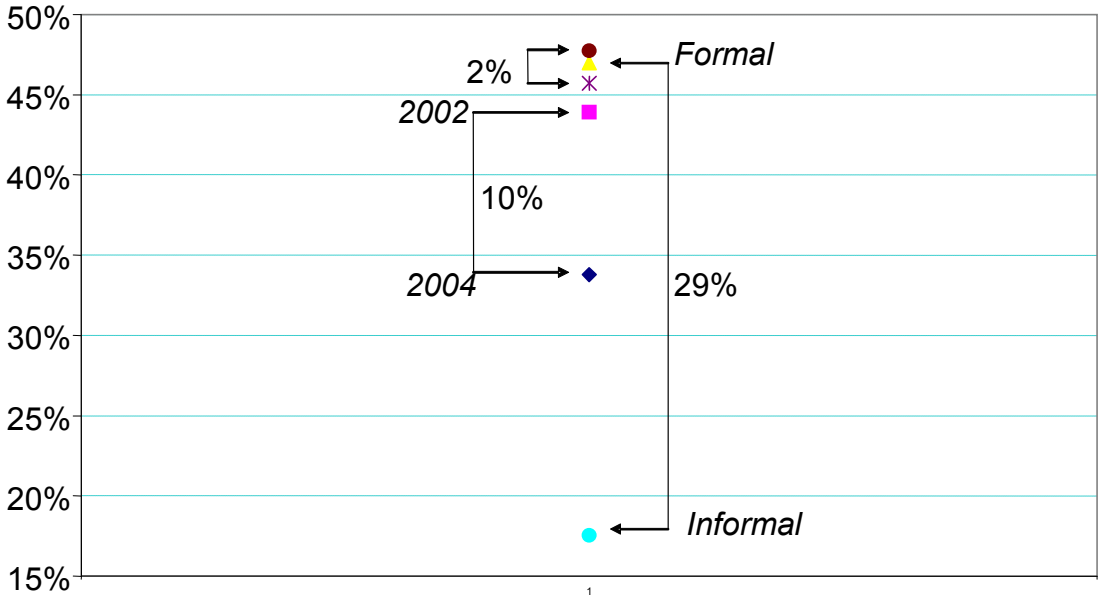
Graph 3. Survival Function in Unemployment



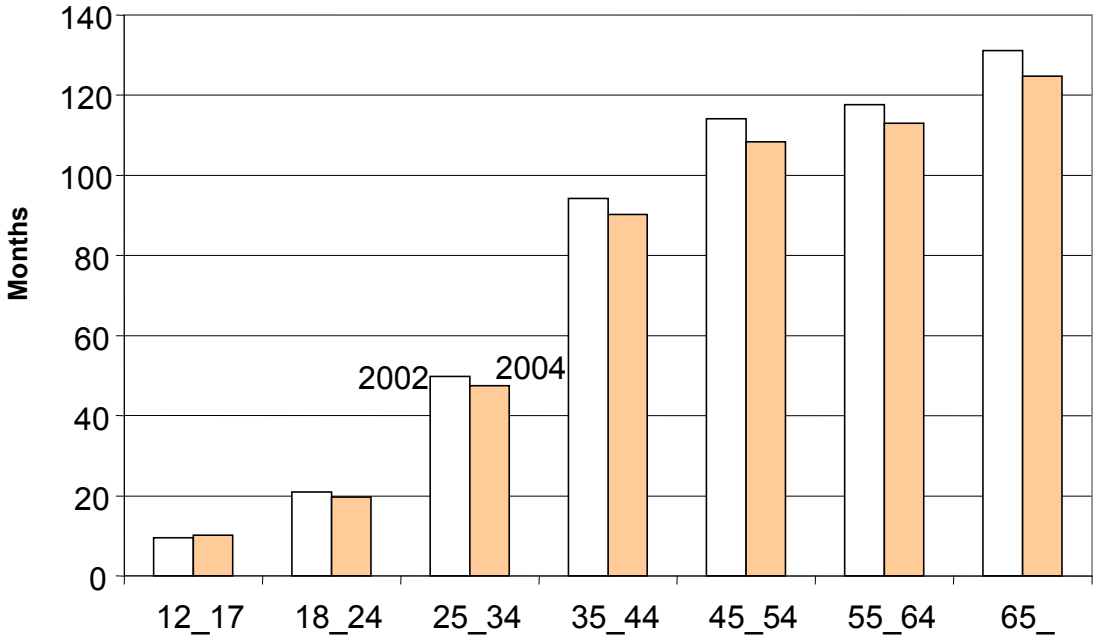
Graph 4a. Formal/Informal Survival Function



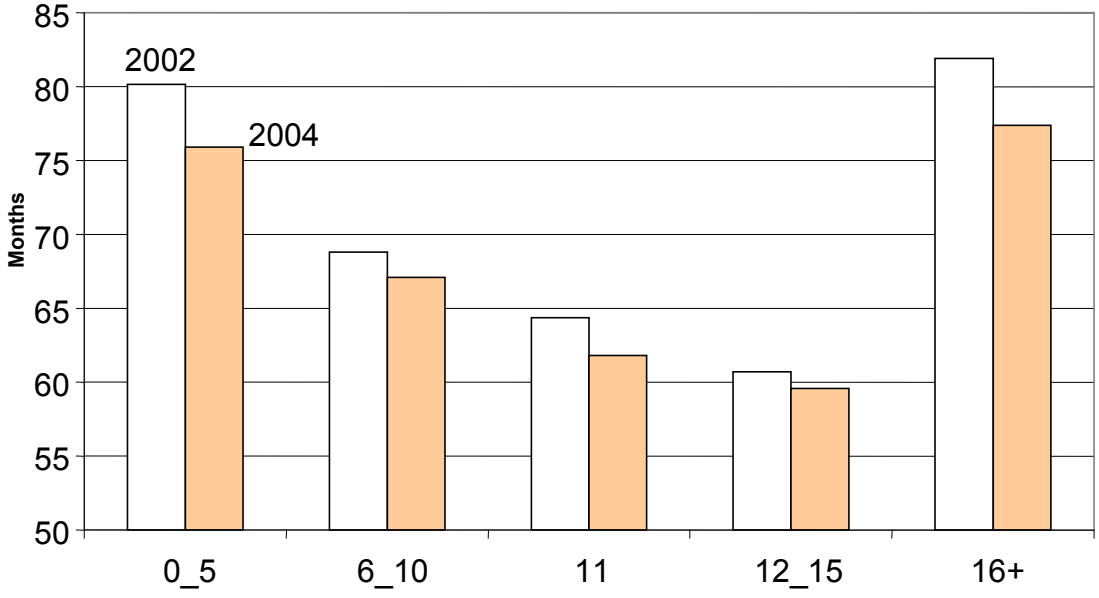
Graph 4b. Differences in the probability at six months



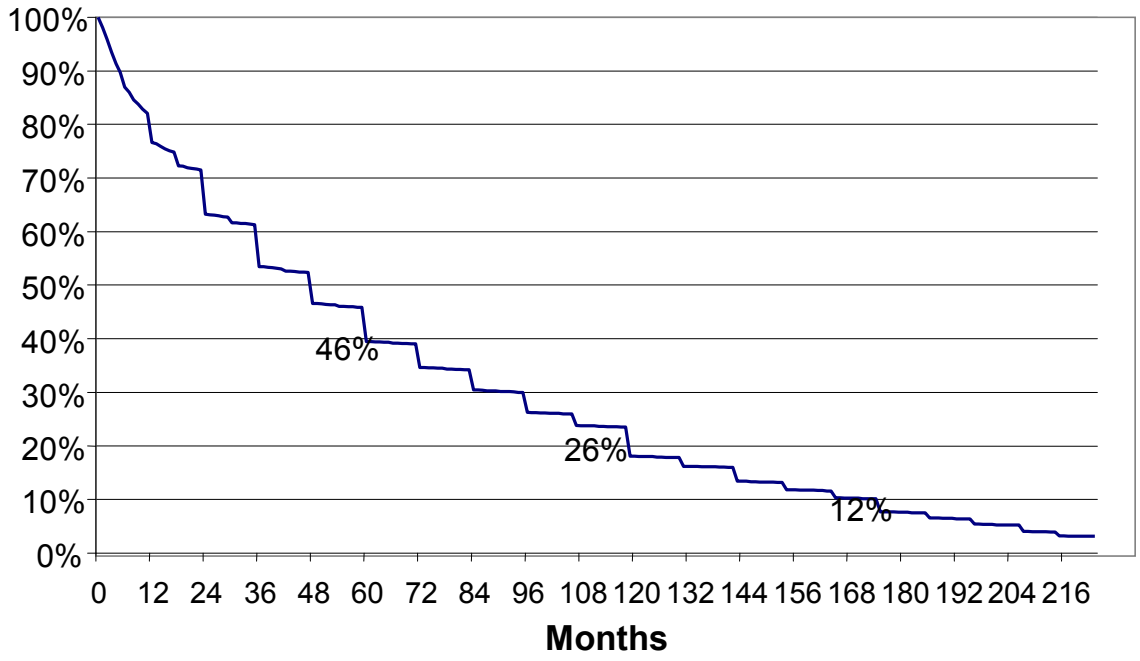
Graph 5a. Duration of Employment by Age



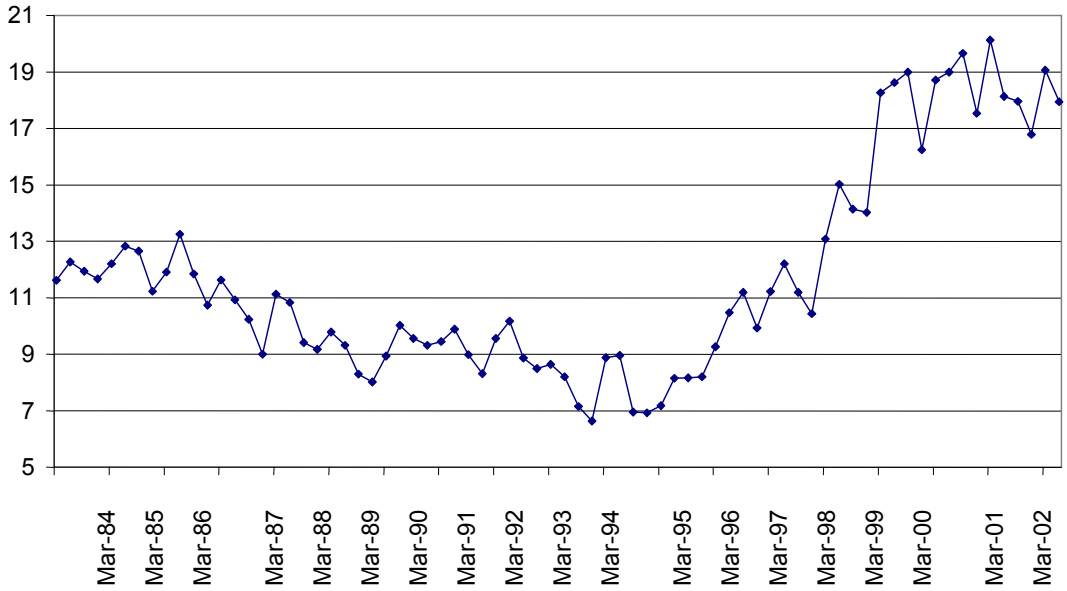
Graph 5b. Duration of employment by Education



Graph 6. Survival Function in Employment



Annex 1. Unemployment rate (7 cities)



Annex 2. Labor Market Statistics

	2,001	2,002	2,003	2,004
% Working Age Population	75.2	75.5	75.9	76.3
Labor force participation rate	59.7	61.0	61.6	60.5
Employment rate	50.9	51.4	53.0	52.0
Unemployment rate	14.7	15.8	14.0	14.1
Total population (thousands)	41,625	42,327	43,043	43,770
Working Age Population	31,286	31,969	32,666	33,376
Economically Active Population	18,682	19,495	20,138	20,199
Employed	15,940	16,416	17,319	17,344
Unemployed	2,743	3,079	2,819	2,855
Percentage change				
Total population		1.69%	1.69%	1.69%
Working Age Population		2.18%	2.18%	2.17%
Economically Active Population		4.35%	3.30%	0.30%
Employed		2.99%	5.50%	0.15%
Unemployed		12.25%	-8.43%	1.26%

Source: DANE, Continuous Household Survey